



# Tantalum Leaded Capacitors

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The Capacitance Company  
**KEMET**  
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## Tantalum Hermetically Sealed/Axial Capacitors

|                                                     |       |
|-----------------------------------------------------|-------|
| Military Ordering Information                       | 4     |
| Military Marking Information                        | 4     |
| Military Approval Levels                            | 5     |
| Performance Characteristics                         | 5     |
| T110/T212 (CSR13) MIL-PRF-39003/1 Series            |       |
| Outline Drawing                                     | 6     |
| Dimensions                                          | 6     |
| Ordering & T110 Marking Information                 | 6     |
| Ratings and Part Number Reference                   | 7-19  |
| T111/T213 (CSR91) MIL-PRF-39003/4 Series            |       |
| Outline Drawing                                     | 20    |
| Dimensions                                          | 20    |
| Ordering & T111 Marking Information                 | 20    |
| Ratings and Part Number Reference                   | 20-23 |
| T222 (CSR09) MIL-PRF-39003/2 Series                 |       |
| Outline Drawing                                     | 24    |
| Dimensions                                          | 24    |
| Ordering & Military Marking Information             | 24    |
| Ratings and Part Number Reference                   | 25-26 |
| T140/T242 (CSR23) MIL-PRF-39003/3 Series            |       |
| Outline Drawing                                     | 27    |
| Dimensions                                          | 27    |
| T140 Marking Information                            | 27    |
| Ratings and Part Number Reference                   | 27-30 |
| T252 (CSR33) MIL-PRF-39003/6 Series                 |       |
| Outline Drawing                                     | 31    |
| Dimensions                                          | 31    |
| Ordering Information                                | 31    |
| Ratings and Part Number Reference                   | 32-33 |
| T262 (CSR21) MIL-PRF-39003/9 Series                 |       |
| Outline Drawing                                     | 34    |
| Dimensions                                          | 34    |
| Ordering Information                                | 34    |
| Ratings and Part Number Reference                   | 35-36 |
| T216 (CSS13) & T256 (CSS33) MIL-PRF-39003/10 Series |       |
| Outline Drawing                                     | 37    |
| Dimensions                                          | 37    |
| Ordering Information                                | 37    |
| Military Ordering Information                       | 38    |
| Marking Information                                 | 38    |
| Ratings and Part Number Reference                   | 38-41 |

## Tantalum Molded Axial/Radial Capacitors

|                                                            |       |
|------------------------------------------------------------|-------|
| T322/T323 (CX01 & CX05) MIL-PRF-49137/1 & 5 Series — Axial |       |
| Performance Characteristics                                | 42    |
| Outline Drawing                                            | 43    |
| Dimensions                                                 | 43    |
| Ordering Information                                       | 43    |
| Ratings and Part Number Reference                          | 44-48 |

|                                        |       |
|----------------------------------------|-------|
| T330 & T340 Series — Radial            |       |
| Performance Characteristics            | 49    |
| T330 Outline Drawing                   | 50    |
| T330 Dimensions                        | 50    |
| T330 Ordering Information              | 50    |
| T330 Marking Information               | 50    |
| T330 Ratings and Part Number Reference | 51-52 |
| T340 Outline Drawing                   | 53    |
| T340 Dimensions                        | 53    |
| T340 Ordering Information              | 53    |
| T340 Marking Information               | 54    |
| T340 Ratings and Part Number Reference | 55-57 |

|                                                  |    |
|--------------------------------------------------|----|
| T370/T378 (CX06) MIL-PRF-49137/6 Series — Radial |    |
| Performance Characteristics                      | 58 |
| Outline Drawing                                  | 59 |
| Dimensions                                       | 59 |
| Marking Information                              | 59 |
| Ordering Information                             | 59 |
| Ratings and Part Number Reference                | 60 |

## Tantalum Dipped Radial Capacitors

|                                                  |       |
|--------------------------------------------------|-------|
| Performance Characteristics                      | 61    |
| T35X Series                                      |       |
| Outline Drawing                                  | 62    |
| Dimensions                                       | 62    |
| Lead Configuration                               | 62    |
| Ordering Information                             | 63    |
| Marking Information                              | 63    |
| Ratings and Part Number Reference                | 63-65 |
| T363 (CX02) & T369 (CX12) MIL-PRF-49137/2 Series |       |
| Outline Drawing                                  | 66    |
| Dimensions                                       | 66    |
| Marking Information                              | 66    |
| Ordering Information                             | 66    |
| Ratings and Part Number Reference                | 67    |
| T368 Series                                      |       |
| Outline Drawing                                  | 68    |
| Dimensions                                       | 68    |
| Ratings and Part Number Reference                | 68    |
| T396 & T398 Series                               |       |
| Outline Drawing                                  | 69    |
| Dimensions                                       | 69    |
| Ordering Information                             | 69    |
| Ratings and Part Number Reference                | 70    |

## Tantalum Axial Tape & Reel Packaging Information 71

## Tantalum Radial Tape & Reel Packaging Information 72

## Tantalum Leaded Packaging Quantities 73-74

## Application Notes for Solid Tantalum Capacitors 75-83

### IMPORTANT NOTICE

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Furthermore, under no circumstances shall KEMET Electronics Corporation be liable for consequential, special, incidental or indirect damages resulting from the use or handling of this product.

Finally, KEMET Electronics Corporation does not assume any responsibility for the correctness of the information contained in this catalog. All design characteristics, specifications, tolerances, and the like are subject to change without notice.

## ORDERING INFORMATION (OBSOLETE\*)



| Symbol | VDC Working |       | VDC Surge |       |
|--------|-------------|-------|-----------|-------|
|        | 85°C        | 125°C | 85°C      | 125°C |
| B      | 6           | 4     | 8         | 5     |
| C      | 10          | 7     | 13        | 9     |
| D      | 15          | 10    | 20        | 12    |
| E      | 20          | 13    | 26        | 16    |
| F      | 35          | 23    | 46        | 28    |
| G      | 50          | 33    | 65        | 40    |
| H      | 75          | 50    | 98        | 64    |
| J      | 100         | 67    | 130       | 86    |

**Examples**

565 — 5,600,000 = 5.60  $\mu$ F    563 — 56,000 = .056  $\mu$ F  
564 — 560,000 = .56  $\mu$ F

\* This Military Part Numbering System is obsolete in accordance with the current specifications. The correct current designation for a CSR part number is the MIL Specification Number, followed by the Specification (slash) Sheet Number and Dash Number (i.e. — MIL-PRF-39003/01-2270). However, the part number breakdown shown above is still widely used and is shown for reference.

## MILITARY CAPACITOR APPROVED FAILURE RATE LEVELS AND MARKINGS PER MIL-PRF-39003 FOR CSR09 (T222 A & B CASE SIZES ONLY), CSR13 (T212), CSR21 (T262), CSR23 (T242) & CSR33 (T252) CAPACITORS

### KEMET APPROVED FAILURE RATE LEVELS — MIL-PRF-39003/H (EXPONENTIAL)

| STYLE | DESCRIPTION            | KEMET SERIES | APPROVED FAILURE RATE LEVEL |
|-------|------------------------|--------------|-----------------------------|
| CSR09 | Polar-Subminiature     | T222         | S (0.001%/k hrs.)           |
| CSR13 | Polar-Standard         | T212         | S (0.001%/k hrs.)           |
|       | MIL Range              |              |                             |
| CSR21 | Polar-Standard Low ESR | T262         | S (0.001%/k hrs.)           |
|       | MIL Range              |              |                             |
| CSR23 | Polar-Extended Range   | T242         | S (0.001%/k hrs.)           |

| STYLE | DESCRIPTION          | KEMET SERIES | APPROVED FAILURE RATE LEVEL |
|-------|----------------------|--------------|-----------------------------|
| CSR33 | Polar-Extended Range | T252         | S (0.001%/k hrs.)           |
|       | Low Leakage          |              |                             |
| CSR91 | Non-Polar            | T213         | S (0.001%/k hrs.)           |

## MILITARY MARKING

### A CASE

|        |                                                                                          |
|--------|------------------------------------------------------------------------------------------|
| 39003  | Military specification number                                                            |
| 01 - K | Specification sheet number and trademark                                                 |
| 9002J  | Military dash number and "J" for JAN                                                     |
| +333   | Polarity, date code (1st digit indicates year and the next two digits indicate the week) |
| XY     | Lot symbol                                                                               |

### C & D CASES

|              |                                                                   |
|--------------|-------------------------------------------------------------------|
| M39003       | Military specification number                                     |
| 01 - 8222J   | Specification sheet number, Military dash number, and "J" for JAN |
| +8.2 $\mu$ F | Positive terminal identifier and capacitance value                |
| 10% 50V      | Capacitance tolerance and voltage                                 |
| 31433        | Source code                                                       |
| 0333 XY K    | Date code, lot code, and trademark                                |

### B CASE

|         |                                                                                                      |
|---------|------------------------------------------------------------------------------------------------------|
| M39003  | Military specification number                                                                        |
| 01 -    | Specification sheet number                                                                           |
| 8006J   | Military dash number and "J" for JAN                                                                 |
| 31433   | Source code                                                                                          |
| +333 XY | Polarity, date code (1st digit indicates year and the next two digits indicate the week), lot symbol |

### CSR91 (T213) CAPACITORS

#### A, B, C & D CASES

|               |                                                                   |
|---------------|-------------------------------------------------------------------|
| M39003        | Military specification number                                     |
| 04 - 0980J    | Specification sheet number, Military dash number, and "J" for JAN |
| 1 $\mu$ F     | Capacitance value                                                 |
| 10% 20VNP     | Capacitance tolerance and voltage rating                          |
| 0333 XY 31433 | Date code, lot code, and source code                              |

(See page 38 for CSS Marking)

## KEMET APPROVED FAILURE RATE LEVELS — MIL-PRF-39003/H (GRADED)

| STYLE   | DESCRIPTION                     | KEMET SERIES | APPROVED FAILURE RATE LEVEL* |
|---------|---------------------------------|--------------|------------------------------|
| CSR09   | Polar-Subminiature              | T222         | D (0.001%/k hrs.)            |
| CSR13*  | Polar-Standard MIL Case         | T212         | D (0.001%/k hrs.)            |
| CSS13** | Polar-Standard MIL Case         | T216         | C (0.01%/k hrs.)             |
| CSR21   | Polar-Standard Low ESR MIL Case | T262         | D (0.001%/k hrs.)            |
| CSR23*  | Polar-Extended Range            | T242         | D (0.001%/k hrs.)            |

\*Not approved to 'D' Failure Rate Level on all voltages and capacitance values.

\*\*MIL-PRF-39003/10 for space applications.

| STYLE   | DESCRIPTION                      | KEMET SERIES | APPROVED FAILURE RATE LEVEL* |
|---------|----------------------------------|--------------|------------------------------|
| CSR33*  | Polar-Extended Range Low Leakage | T252         | D (0.001%/k hrs.)            |
| CSS33** | Polar-Extended Range Low Leakage | T256         | C (0.01%/k hrs.)             |
| CSR91*  | Non-Polar                        | T213         | D (0.001%/k hrs.)            |

\*Not approved to 'D' Failure Rate Level on all voltages and capacitance values.

\*\*MIL-PRF-39003/10 for space applications.

## PERFORMANCE CHARACTERISTICS

- **CAPACITANCE/VOLTAGE RANGE:** .0023-1200 $\mu$ F, 6-125 Volts.
- **CAPACITANCE TOLERANCE:** Available in standard EIA values with  $\pm 20\%$ ,  $\pm 10\%$  and  $\pm 5\%$  tolerances.
- **DISSIPATION FACTOR:** Maximum DF limits are shown in corresponding series part number listings on pages 7-41. See Application Notes Section, page 76 for additional description.
- **DC LEAKAGE CURRENT:** Each corresponding part number table lists maximum leakage current for each capacitor on pages 7-41. See Application Notes Section, page 76 for additional description.
- **RATED VOLTAGE; WORKING VOLTAGE; SURGE VOLTAGE; REVERSE VOLTAGE:** See Application Notes Section, Pages 76 & 77 for description.
- **IMPEDANCE and ESR:** See Application Notes Section, pages 77 & 78 for description. Reference ESR values are shown for commercial hermetically sealed capacitors on page 19.

- **AC RIPPLE VOLTAGE:** Permissible AC ripple voltage is related to the ESR of the capacitor and the power dissipation capabilities of a particular case size. Thermal capacities for the various case sizes have been determined empirically and are listed below. For additional description see page 78.

| Standard Case Size | Watts | T222 |
|--------------------|-------|------|
| A                  | .09   | .070 |
| B                  | .100  | .090 |
| C                  | .125  | —    |
| D                  | .180  | —    |

Maximum Power Dissipation: 25°C Ambient

- **ENVIRONMENTAL CONSIDERATIONS:**
  - A. Shock Test: MIL-STD-202, Method 213
  - B. Thermal Shock, MIL-STD-202, Method 107, Condition B.
  - C. Moisture Resistance: MIL-STD-202, Method 106.
  - D. Solderability: MIL-STD-202, Method 208

For additional Environmental Test Information see pages 80, 81 and 82.

- **LEAD MATERIAL:** Standard leads are solder-coated nickel per MIL-STD-1276.
- **INSULATING SLEEVES:** The standard insulating material used in transparent high temperature plastic, having 2000 volt dielectric strength, excellent dimensional stability and chemical and cold flow resistance.
- **LEAD TAPE and REEL:** Reeling per specification RS-296. See pages 71 and 73 for additional information.

KEMET standard hermetic sealed T110 Series are desirable for use in high humidity environments. They are ruggedly built, designed for miniaturized circuitry, and are especially suited for coupling, bypass, filtering and R-C timing circuits. They exhibit excellent stability, extremely low DC leakage current, dissipation factor, and ESR/impedance over a wide temperature and frequency range.

Available in standard EIA capacitance values from .0047-330  $\mu\text{F}$  in  $\pm 20\%$ ,  $\pm 10\%$ , and  $\pm 5\%$  tolerances and working voltages from 6-125 VDC.

Higher CV values in comparable case sizes are available in KEMET T140 Series. Refer to page 27.

Included in the following Series table is a complete listing of CSR13 qualified MIL-PRF-39003 capacitors. KEMET is approved to manufacture the S (0.001%/k hrs.) Exponential & D (0.001%/k hrs.) Graded failure rate levels.

KEMET is now offering low ESR limits in the T110 Series. See ESR chart on page 19. You may order the lower ESR by using Customer Specification 2864 as the last four digits of the part number.

Effective September 30, 2005, the KEMET T110 Series is RoHS Compliant.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | UNINSULATED               |                           | INSULATED                 |                           | B<br>$\pm 0.002$<br>(.05) | C<br>MAX.        |
|-----------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------|
|           | D<br>$\pm 0.005$<br>(.13) | L<br>$\pm 0.031$<br>(.79) | D<br>$\pm 0.010$<br>(.25) | L<br>$\pm 0.031$<br>(.79) |                           |                  |
| A         | 0.125<br>(3.18)           | 0.250<br>(6.35)           | 0.135<br>(3.43)           | 0.286<br>(7.26)           | 0.020<br>(.51)            | 0.422<br>(10.72) |
| B         | 0.175<br>(4.45)           | 0.438<br>(11.13)          | 0.185<br>(4.70)           | 0.474<br>(12.04)          | 0.020<br>(.51)            | 0.610<br>(15.49) |
| C         | 0.279<br>(7.09)           | 0.650<br>(16.51)          | 0.289<br>(7.34)           | 0.686<br>(17.42)          | 0.025<br>(.64)            | 0.822<br>(20.88) |
| D         | 0.341<br>(8.66)           | 0.750<br>(19.05)          | 0.351<br>(8.92)           | 0.786<br>(19.96)          | 0.025<br>(.64)            | 0.922<br>(23.42) |

### ORDERING INFORMATION\*

**TANTALUM** — T

**SERIES** — XXX  
T110, T212 (CSR13)  
T111, T213 (CSR91)  
T140, T242 (CSR23)

**CASE SIZE** — A / B / C / D

**PICOFARAD CODE** — A 105 K 050  
First two digits represent significant figures.  
Third digit specifies number of zeros to follow.

**CAPACITANCE TOLERANCE** — A S C  
M —  $\pm 20\%$  K —  $\pm 10\%$  J —  $\pm 5\%$

**VOLTAGE** —  
At 85°C

**LEAD MATERIAL**  
S — Standard  
T — 100% Tin (T110, T140 Series only)

**FAILURE RATE\*\***  
**GRADED**  
A — Not Applicable  
B — 0.1%/k hrs.  
C — 0.01%/k hrs.  
D — 0.001%/k hrs.  
**EXPONENTIAL**  
M — 1%/k hrs.  
P — 0.1%/k hrs.  
R — 0.01%/k hrs.  
S — 0.001%/k hrs.

**SPECIFICATION**  
All capacitors are sleeved unless specified.

**\*\*Part Number Example: T110A105K050AS (14 digits - no spaces)**  
**\*For Military Ordering Information, see page 4.**

### MARKING INFORMATION

Marking: Unless otherwise specified by special order, standard marking of T110 Series capacitor consists of the following:

#### A, B, C & D CASES

|                   |                                                                   |
|-------------------|-------------------------------------------------------------------|
| +K 10%            | — Polarity, Manufacturer's Identification and Capacitance Tol.    |
| R56 $\mu\text{F}$ | — Nominal Capacitance — ( $\mu\text{F}$ ) ("R" indicates decimal) |
| 100V              | — Voltage                                                         |
| 0312              | — Date Code (e.g.: 0312)                                          |

\* For Military Marking, see page 4.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                               | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                                                |
|-------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------------------------------------|
|                                                 |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|                                                 |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                                                |
|                                                 |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                                                |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C  |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                                                |
| 2.2                                             | A            | 5,10,20                        | T110A225(1)006AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 2.7                                             | A            | 5,10,20                        | T110A275(1)006AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 3.3                                             | A            | 5,10,20                        | T110A335(1)006AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 3.9                                             | A            | 5,10,20                        | T110A395(1)006AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 4.7                                             | A            | 5,10,20                        | T110A475(1)006AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 5.6                                             | A            | 5                              | T110A565J006AS       | 0.3                                | 4                                                 | 5001                                                      | 5201       | 5401        | 5601         | 6001                       | 7001        | 8001         | T212A565J006(2)S                               |
| 5.6                                             | A            | 10                             | T110A565K006AS       | 0.3                                | 4                                                 | 2241                                                      | 2481       | 2721        | 2961         | 6002                       | 7002        | 8002         | T212A565K006(2)S                               |
| 5.6                                             | A            | 20                             | T110A565M006AS       | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 6.8                                             | A            | 5                              | T110A685J006AS       | 0.3                                | 6                                                 | 5002                                                      | 5202       | 5402        | 5602         | 6003                       | 7003        | 8003         | T212A685J006(2)S                               |
| 6.8                                             | A            | 10                             | T110A685K006AS       | 0.3                                | 6                                                 | 2242                                                      | 2482       | 2722        | 2962         | 6004                       | 7004        | 8004         | T212A685K006(2)S                               |
| 6.8                                             | A            | 20                             | T110A685M006AS       | 0.3                                | 6                                                 | 2243                                                      | 2483       | 2723        | 2963         | 6005                       | 7005        | 8005         | T212A685M006(2)S                               |
| 8.2                                             | B            | 5,10,20                        | T110B825(1)006AS     | 0.3                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 10.0                                            | B            | 5,10,20                        | T110B106(1)006AS     | 0.3                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 12.0                                            | B            | 5,10,20                        | T110B126(1)006AS     | 0.5                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 15.0                                            | B            | 5,10,20                        | T110B156(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 18.0                                            | B            | 5,10,20                        | T110B186(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 22.0                                            | B            | 5,10,20                        | T110B226(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 27.0                                            | B            | 5,10,20                        | T110B276(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 33.0                                            | B            | 5,10,20                        | T110B336(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 39.0                                            | B            | 5,10,20                        | T110B396(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 47.0                                            | B            | 5                              | T110B476J006AS       | 1.5                                | 6                                                 | 5003                                                      | 5203       | 5403        | 5603         | 6006                       | 7006        | 8006         | T212B476J006(2)S                               |
| 47.0                                            | B            | 10                             | T110B476K006AS       | 1.5                                | 6                                                 | 2244                                                      | 2484       | 2724        | 2964         | 6007                       | 7007        | 8007         | T212B476K006(2)S                               |
| 47.0                                            | B            | 20                             | T110B476M006AS       | 1.5                                | 6                                                 | 2245                                                      | 2485       | 2725        | 2965         | 6008                       | 7008        | 8008         | T212B476M006(2)S                               |
| 56.0                                            | B            | 5                              | T110B566J006AS       | 1.5                                | 6                                                 | 5004                                                      | 5204       | 5404        | 5604         | 6009                       | 7009        | 8009         | T212B566J006(2)S                               |
| 56.0                                            | B            | 10                             | T110B566K006AS       | 1.5                                | 6                                                 | 2246                                                      | 2486       | 2726        | 2966         | 6010                       | 7010        | 8010         | T212B566K006(2)S                               |
| 56.0                                            | B            | 20                             | T110B566M006AS       | 1.5                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 68.0                                            | C            | 5,10,20                        | T110C686(1)006AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 82.0                                            | C            | 5,10,20                        | T110C826(1)006AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 100.0                                           | C            | 5,10,20                        | T110C107(1)006AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 120.0                                           | C            | 5,10,20                        | T110C127(1)006AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 150.0                                           | C            | 5                              | T110C157J006AS       | 4.5                                | 6                                                 | 5005                                                      | 5205       | 5405        | 5605         | 6011                       | 7011        | 8011         | T212C157J006(2)S                               |
| 150.0                                           | C            | 10                             | T110C157K006AS       | 4.5                                | 6                                                 | 2247                                                      | 2487       | 2727        | 2967         | 6012                       | 7012        | 8012         | T212C157K006(2)S                               |
| 150.0                                           | C            | 20                             | T110C157M006AS       | 4.5                                | 6                                                 | 2248                                                      | 2488       | 2728        | 2968         | 6013                       | 7013        | 8013         | T212C157M006(2)S                               |
| 180.0                                           | C            | 5                              | T110C187J006AS       | 5.5                                | 6                                                 | 5006                                                      | 5206       | 5406        | 5606         | 6014                       | 7014        | 8014         | T212C187J006(2)S                               |
| 180.0                                           | C            | 10                             | T110C187K006AS       | 5.5                                | 6                                                 | 2249                                                      | 2489       | 2729        | 2969         | 6015                       | 7015        | 8015         | T212C187K006(2)S                               |
| 180.0                                           | C            | 20                             | T110C187M006AS       | 5.5                                | 6                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 220.0                                           | D            | 5,10,20                        | T110D227(1)006AS     | 6.0                                | 8                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 270.0                                           | D            | 5                              | T110D277J006AS       | 6.0                                | 8                                                 | 5007                                                      | 5207       | 5407        | 5607         | 6016                       | 7016        | 8016         | T212D277J006(2)S                               |
| 270.0                                           | D            | 10                             | T110D277K006AS       | 6.0                                | 8                                                 | 2250                                                      | 2490       | 2730        | 2970         | 6017                       | 7017        | 8017         | T212D277K006(2)S                               |
| 270.0                                           | D            | 20                             | T110D277M006AS       | 6.0                                | 8                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 330.0                                           | D            | 5                              | T110D337J006AS       | 7.5                                | 8                                                 | 5008                                                      | 5208       | 5408        | 5608         | 6018                       | 7018        | 8018         | T212D337J006(2)S                               |
| 330.0                                           | D            | 10                             | T110D337K006AS       | 7.5                                | 8                                                 | 2251                                                      | 2491       | 2731        | 2971         | 6019                       | 7019        | 8019         | T212D337K006(2)S                               |
| 330.0                                           | D            | 20                             | T110D337M006AS       | 7.5                                | 8                                                 | 2252                                                      | 2492       | 2732        | 2972         | 6020                       | 7020        | 8020         | T212D337M006(2)S                               |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                                                |
| 1.0                                             | A            | 5,10,20                        | T110A105(1)010AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 1.2                                             | A            | 5,10,20                        | T110A125(1)010AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 1.5                                             | A            | 5,10,20                        | T110A155(1)010AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 1.8                                             | A            | 5,10,20                        | T110A185(1)010AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 2.2                                             | A            | 5,10,20                        | T110A225(1)010AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 2.7                                             | A            | 5,10,20                        | T110A275(1)010AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 3.3                                             | A            | 5,10,20                        | T110A335(1)010AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 3.9                                             | A            | 5                              | T110A395J 010AS      | 0.3                                | 4                                                 | 5009                                                      | 5209       | 5409        | 5609         | 6021                       | 7021        | 8021         | T212A395J010(2)S                               |
| 3.9                                             | A            | 10                             | T110A395K 010AS      | 0.3                                | 4                                                 | 2253                                                      | 2493       | 2733        | 2973         | 6022                       | 7022        | 8022         | T212A395K010(2)S                               |
| 3.9                                             | A            | 20                             | T110A395M 010AS      | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                                                |
| 4.7                                             | A            | 5                              | T110A475J 010AS      | 0.4                                | 4                                                 | 5010                                                      | 5210       | 5410        | 5610         | 6023                       | 7023        | 8023         | T212A475J010(2)S                               |
| 4.7                                             | A            | 10                             | T110A475K 010AS      | 0.4                                | 4                                                 | 2254                                                      | 2494       | 2734        | 2974         | 6024                       | 7024        | 8024         | T212A475K010(2)S                               |
| 4.7                                             | A            | 20                             | T110A475M010AS       | 0.4                                | 4                                                 | 2255                                                      | 2495       | 2735        | 2975         | 6025                       | 7025        | 8025         | T212A475M010(2)S                               |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T110 SERIES — POLAR TYPE & T212 (CSR13)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                        | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |  |  |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|--|--|--|------------------------------------------------|
|                                                          |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |  |  |  |                                                |
|                                                          |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |  |  |  |                                                |
|                                                          |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |  |  |  |                                                |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 5.6                                                      | B            | 5,10,20                        | T110B565(1)010AS     | 0.4                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 6.8                                                      | B            | 5,10,20                        | T110B685(1)010AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 8.2                                                      | B            | 5,10,20                        | T110B825(1)010AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 10.0                                                     | B            | 5,10,20                        | T110B106(1)010AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 12.0                                                     | B            | 5,10,20                        | T110B126(1)010AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 15.0                                                     | B            | 5,10,20                        | T110B156(1)010AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 18.0                                                     | B            | 5,10,20                        | T110B186(1)010AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 22.0                                                     | B            | 5,10,20                        | T110B226(1)010AS     | 2.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 27.0                                                     | B            | 5                              | T110B276J010AS       | 2.0                                | 6                                                 | 5011                                                      | 5211       | 5411        | 5611         | 6026                       | 7026        | 8026         |  |  |  | T212B276J010(2)S                               |
| 27.0                                                     | B            | 10                             | T110B276K010AS       | 2.0                                | 6                                                 | 2256                                                      | 2496       | 2736        | 2976         | 6027                       | 7027        | 8027         |  |  |  | T212B276K010(2)S                               |
| 27.0                                                     | B            | 20                             | T110B276M010AS       | 2.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 33.0                                                     | B            | 5                              | T110B336J010AS       | 2.0                                | 6                                                 | 5012                                                      | 5212       | 5412        | 5612         | 6028                       | 7028        | 8028         |  |  |  | T212B336J010(2)S                               |
| 33.0                                                     | B            | 10                             | T110B336K010AS       | 2.0                                | 6                                                 | 2257                                                      | 2497       | 2737        | 2977         | 6029                       | 7029        | 8029         |  |  |  | T212B336K010(2)S                               |
| 33.0                                                     | B            | 20                             | T110B336M010AS       | 2.0                                | 6                                                 | 2258                                                      | 2498       | 2738        | 2978         | 6030                       | 7030        | 8030         |  |  |  | T212B336M010(2)S                               |
| 39.0                                                     | B            | 5                              | T110B396J010AS       | 2.0                                | 6                                                 | 5013                                                      | 5213       | 5413        | 5613         | 6031                       | 7031        | 8031         |  |  |  | T212B396J010(2)S                               |
| 39.0                                                     | B            | 10                             | T110B396K010AS       | 2.0                                | 6                                                 | 2259                                                      | 2499       | 2739        | 2979         | 6032                       | 7032        | 8032         |  |  |  | T212B396K010(2)S                               |
| 39.0                                                     | B            | 20                             | T110B396M010AS       | 2.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 47.0                                                     | C            | 5,10,20                        | T110C476(1)010AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 56.0                                                     | C            | 5,10,20                        | T110C566(1)010AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 68.0                                                     | C            | 5,10,20                        | T110C686(1)010AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 82.0                                                     | C            | 5                              | T110C826J010AS       | 3.0                                | 6                                                 | 5014                                                      | 5214       | 5414        | 5614         | 6033                       | 7033        | 8033         |  |  |  | T212C826J010(2)S                               |
| 82.0                                                     | C            | 10                             | T110C826K010AS       | 3.0                                | 6                                                 | 2260                                                      | 2500       | 2740        | 2980         | 6034                       | 7034        | 8034         |  |  |  | T212C826K010(2)S                               |
| 82.0                                                     | C            | 20                             | T110C826M010AS       | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 100.0                                                    | C            | 5                              | T110C107J010AS       | 5.0                                | 6                                                 | 5015                                                      | 5215       | 5415        | 5615         | 6035                       | 7035        | 8035         |  |  |  | T212C107J010(2)S                               |
| 100.0                                                    | C            | 10                             | T110C107K010AS       | 5.0                                | 6                                                 | 2261                                                      | 2501       | 2741        | 2981         | 6036                       | 7036        | 8036         |  |  |  | T212C107K010(2)S                               |
| 100.0                                                    | C            | 20                             | T110C107M010AS       | 5.0                                | 6                                                 | 2262                                                      | 2502       | 2742        | 2982         | 6037                       | 7037        | 8037         |  |  |  | T212C107M010(2)S                               |
| 120.0                                                    | C            | 5                              | T110C127J010AS       | 6.0                                | 6                                                 | 5016                                                      | 5216       | 5416        | 5616         | 6038                       | 7038        | 8038         |  |  |  | T212C127J010(2)S                               |
| 120.0                                                    | C            | 10                             | T110C127K010AS       | 6.0                                | 6                                                 | 2263                                                      | 2503       | 2743        | 2983         | 6039                       | 7039        | 8039         |  |  |  | T212C127K010(2)S                               |
| 120.0                                                    | C            | 20                             | T110C127M010AS       | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 150.0                                                    | D            | 5,10,20                        | T110D157(1)010AS     | 9.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 180.0                                                    | D            | 5                              | T110D187J010AS       | 9.0                                | 6                                                 | 5017                                                      | 5217       | 5417        | 5617         | 6040                       | 7040        | 8040         |  |  |  | T212D187J010(2)S                               |
| 180.0                                                    | D            | 10                             | T110D187K010AS       | 9.0                                | 6                                                 | 2264                                                      | 2504       | 2744        | 2984         | 6041                       | 7041        | 8041         |  |  |  | T212D187K010(2)S                               |
| 180.0                                                    | D            | 20                             | T110D187M010AS       | 9.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 220.0                                                    | D            | 5                              | T110D227J010AS       | 10.0                               | 8                                                 | 5018                                                      | 5218       | 5418        | 5618         | 6042                       | 7042        | 8042         |  |  |  | T212D227J010(2)S                               |
| 220.0                                                    | D            | 10                             | T110D227K010AS       | 10.0                               | 8                                                 | 2265                                                      | 2505       | 2745        | 2985         | 6043                       | 7043        | 8043         |  |  |  | T212D227K010(2)S                               |
| 220.0                                                    | D            | 20                             | T110D227M010AS       | 10.0                               | 8                                                 | 2266                                                      | 2506       | 2746        | 2986         | 6044                       | 7044        | 8044         |  |  |  | T212D227M010(2)S                               |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C         |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.33                                                     | A            | 5,10,20                        | T110A334(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.39                                                     | A            | 5,10,20                        | T110A394(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.47                                                     | A            | 5,10,20                        | T110A474(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.56                                                     | A            | 5,10,20                        | T110A564(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.68                                                     | A            | 5,10,20                        | T110A684(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.82                                                     | A            | 5,10,20                        | T110A824(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 1.0                                                      | A            | 5,10,20                        | T110A105(1)015AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 1.2                                                      | A            | 5,10,20                        | T110A125(1)015AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 1.5                                                      | A            | 5,10,20                        | T110A155(1)015AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 1.8                                                      | A            | 5,10,20                        | T110A185(1)015AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 2.2                                                      | A            | 5,10,20                        | T110A225(1)015AS     | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 2.7                                                      | A            | 5                              | T110A275J015AS       | 0.3                                | 4                                                 | 5019                                                      | 5219       | 5419        | 5619         | 6045                       | 7045        | 8045         |  |  |  | T212A275J015(2)S                               |
| 2.7                                                      | A            | 10                             | T110A275K015AS       | 0.3                                | 4                                                 | 2267                                                      | 2507       | 2747        | 2987         | 6046                       | 7046        | 8046         |  |  |  | T212A275K015(2)S                               |
| 2.7                                                      | A            | 20                             | T110A275M015AS       | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 3.3                                                      | A            | 5                              | T110A335J015AS       | 0.4                                | 4                                                 | 5020                                                      | 5220       | 5420        | 5620         | 6047                       | 7047        | 8047         |  |  |  | T212A335J015(2)S                               |
| 3.3                                                      | A            | 10                             | T110A335K015AS       | 0.4                                | 4                                                 | 2268                                                      | 2508       | 2748        | 2988         | 6048                       | 7048        | 8048         |  |  |  | T212A335K015(2)S                               |
| 3.3                                                      | A            | 20                             | T110A335M015AS       | 0.4                                | 4                                                 | 2269                                                      | 2509       | 2749        | 2989         | 6049                       | 7049        | 8049         |  |  |  | T212A335M015(2)S                               |
| 3.9                                                      | B            | 5,10,20                        | T110B395(1)015AS     | 0.4                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 4.7                                                      | B            | 5,10,20                        | T110B475(1)015AS     | 0.7                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 5.6                                                      | B            | 5,10,20                        | T110B565(1)015AS     | 0.7                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 6.8                                                       | B            | 5,10,20                        | T110B685(1)015AS     | 0.7                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 8.2                                                       | B            | 5,10,20                        | T110B825(1)015AS     | 0.7                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                                      | B            | 5,10,20                        | T110B106(1)015AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 12.0                                                      | B            | 5,10,20                        | T110B126(1)015AS     | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                                      | B            | 5,10,20                        | T110B156(1)015AS     | 2.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                                      | B            | 5                              | T110B186J015AS       | 2.0                                | 6                                                 | 5021                                                      | 5221       | 5421        | 5621         | 6050                       | 7050        | 8050         | T212B186J015(2)S |                                                |
| 18.0                                                      | B            | 10                             | T110B186K015AS       | 2.0                                | 6                                                 | 2270                                                      | 2510       | 2750        | 2990         | 6051                       | 7051        | 8051         | T212B186K015(2)S |                                                |
| 18.0                                                      | B            | 20                             | T110B186M015AS       | 2.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 22.0                                                      | B            | 5                              | T110B226J015AS       | 2.0                                | 6                                                 | 5022                                                      | 5222       | 5422        | 5622         | 6052                       | 7052        | 8052         | T212B226J015(2)S |                                                |
| 22.0                                                      | B            | 10                             | T110B226K015AS       | 2.0                                | 6                                                 | 2271                                                      | 2511       | 2751        | 2991         | 6053                       | 7053        | 8053         | T212B226K015(2)S |                                                |
| 22.0                                                      | B            | 20                             | T110B226M015AS       | 2.0                                | 6                                                 | 2272                                                      | 2512       | 2752        | 2992         | 6054                       | 7054        | 8054         | T212B226M015(2)S |                                                |
| 27.0                                                      | C            | 5,10,20                        | T110C276(1)015AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 33.0                                                      | C            | 5,10,20                        | T110C336(1)015AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 39.0                                                      | C            | 5,10,20                        | T110C396(1)015AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 47.0                                                      | C            | 5,10,20                        | T110C476(1)015AS     | 4.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 56.0                                                      | C            | 5                              | T110C566J015AS       | 4.0                                | 6                                                 | 5023                                                      | 5223       | 5423        | 5623         | 6055                       | 7055        | 8055         | T212C566J015(2)S |                                                |
| 56.0                                                      | C            | 10                             | T110C566K015AS       | 4.0                                | 6                                                 | 2273                                                      | 2513       | 2753        | 2993         | 6056                       | 7056        | 8056         | T212C566K015(2)S |                                                |
| 56.0                                                      | C            | 20                             | T110C566M015AS       | 4.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 68.0                                                      | C            | 5                              | T110C686J015AS       | 5.0                                | 6                                                 | 5024                                                      | 5224       | 5424        | 5624         | 6057                       | 7057        | 8057         | T212C686J015(2)S |                                                |
| 68.0                                                      | C            | 10                             | T110C686K015AS       | 5.0                                | 6                                                 | 2274                                                      | 2514       | 2754        | 2994         | 6058                       | 7058        | 8058         | T212C686K015(2)S |                                                |
| 68.0                                                      | C            | 20                             | T110C686M015AS       | 5.0                                | 6                                                 | 2275                                                      | 2515       | 2755        | 2995         | 6059                       | 7059        | 8059         | T212C686M015(2)S |                                                |
| 82.0                                                      | D            | 5,10,20                        | T110D826(1)015AS     | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 100.0                                                     | D            | 5,10,20                        | T110D107(1)015AS     | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 120.0                                                     | D            | 5                              | T110D127J015AS       | 6.0                                | 6                                                 | 5025                                                      | 5225       | 5425        | 5625         | 6060                       | 7060        | 8060         | T212D127J015(2)S |                                                |
| 120.0                                                     | D            | 10                             | T110D127K015AS       | 6.0                                | 6                                                 | 2276                                                      | 2516       | 2756        | 2996         | 6061                       | 7061        | 8061         | T212D127K015(2)S |                                                |
| 120.0                                                     | D            | 20                             | T110D127M015AS       | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 150.0                                                     | D            | 5                              | T110D157J015AS       | 8.0                                | 6                                                 | 5026                                                      | 5226       | 5426        | 5626         | 6062                       | 7062        | 8062         | T212D157J015(2)S |                                                |
| 150.0                                                     | D            | 10                             | T110D157K015AS       | 8.0                                | 6                                                 | 2277                                                      | 2517       | 2757        | 2997         | 6063                       | 7063        | 8063         | T212D157K015(2)S |                                                |
| 150.0                                                     | D            | 20                             | T110D157M015AS       | 8.0                                | 6                                                 | 2278                                                      | 2518       | 2758        | 2998         | 6064                       | 7064        | 8064         | T212D157M015(2)S |                                                |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C          |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.047                                                     | A            | 5,10,20                        | T110A473(1)020AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.056                                                     | A            | 5,10,20                        | T110A563(1)020AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.068                                                     | A            | 5,10,20                        | T110A683(1)020AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.082                                                     | A            | 5,10,20                        | T110A823(1)020AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.1                                                       | A            | 5,10,20                        | T110A104(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.12                                                      | A            | 5,10,20                        | T110A124(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.15                                                      | A            | 5,10,20                        | T110A154(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.18                                                      | A            | 5,10,20                        | T110A184(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.22                                                      | A            | 5,10,20                        | T110A224(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.27                                                      | A            | 5,10,20                        | T110A274(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.33                                                      | A            | 5,10,20                        | T110A334(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.39                                                      | A            | 5,10,20                        | T110A394(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.47                                                      | A            | 5,10,20                        | T110A474(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.56                                                      | A            | 5,10,20                        | T110A564(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.68                                                      | A            | 5,10,20                        | T110A684(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.82                                                      | A            | 5,10,20                        | T110A824(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.0                                                       | A            | 5,10,20                        | T110A105(1)020AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                                       | A            | 5                              | T110A125J020AS       | 0.3                                | 4                                                 | 5027                                                      | 5227       | 5427        | 5627         | 6065                       | 7065        | 8065         | T212A125J020(2)S |                                                |
| 1.2                                                       | A            | 10                             | T110A125K020AS       | 0.3                                | 4                                                 | 2279                                                      | 2519       | 2759        | 2999         | 6066                       | 7066        | 8066         | T212A125K020(2)S |                                                |
| 1.2                                                       | A            | 20                             | T110A125M020AS       | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                                       | A            | 5                              | T110A155J020AS       | 0.3                                | 4                                                 | 5028                                                      | 5228       | 5428        | 5628         | 6067                       | 7067        | 8067         | T212A155J020(2)S |                                                |
| 1.5                                                       | A            | 10                             | T110A155K020AS       | 0.3                                | 4                                                 | 2280                                                      | 2520       | 2760        | 3000         | 6068                       | 7068        | 8068         | T212A155K020(2)S |                                                |
| 1.5                                                       | A            | 20                             | T110A155M020AS       | 0.3                                | 4                                                 | 2281                                                      | 2521       | 2761        | 3001         | 6069                       | 7069        | 8069         | T212A155M020(2)S |                                                |
| 1.8                                                       | A            | 5                              | T110A185J020AS       | 0.3                                | 4                                                 | 5029                                                      | 5229       | 5429        | 5629         | 6070                       | 7070        | 8070         | T212A185J020(2)S |                                                |
| 1.8                                                       | A            | 10                             | T110A185K020AS       | 0.3                                | 4                                                 | 2282                                                      | 2522       | 2762        | 3002         | 6071                       | 7071        | 8071         | T212A185K020(2)S |                                                |
| 1.8                                                       | A            | 20                             | T110A185M020AS       | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                                       | A            | 5                              | T110A225J020AS       | 0.4                                | 4                                                 | 5010                                                      | 5230       | 5430        | 5630         | 6072                       | 7072        | 8072         | T212A225J020(2)S |                                                |
| 2.2                                                       | A            | 10                             | T110A225K020AS       | 0.4                                | 4                                                 | 2283                                                      | 2523       | 2763        | 3003         | 6073                       | 7073        | 8073         | T212A225K020(2)S |                                                |
| 2.2                                                       | A            | 20                             | T110A225M020AS       | 0.4                                | 4                                                 | 2284                                                      | 2524       | 2764        | 3004         | 6074                       | 7074        | 8074         | T212A225M020(2)S |                                                |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

Bold Face lines indicate popular part types and values.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T110 SERIES — POLAR TYPE & T212 (CRS13)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |  |  |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|--|--|--|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |  |  |  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |  |  |  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |  |  |  |                                                |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 2.7                                                       | B            | 5,10,20                        | T110B275(1)020AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 3.3                                                       | B            | 5,10,20                        | T110B335(1)020AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 3.9                                                       | B            | 5,10,20                        | T110B395(1)020AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 4.7                                                       | B            | 5,10,20                        | T110B475(1)020AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 5.6                                                       | B            | 5,10,20                        | T110B565(1)020AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 6.8                                                       | B            | 5,10,20                        | T110B685(1)020AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 8.2                                                       | B            | 5                              | T110B825J020AS       | 1.0                                | 6                                                 | 5031                                                      | 5231       | 5431        | 5631         | 6075                       | 7075        | 8075         |  |  |  | T212B825J020(2)S                               |
| 8.2                                                       | B            | 10                             | T110B825K020AS       | 1.0                                | 6                                                 | 2285                                                      | 2525       | 2765        | 3005         | 6076                       | 7076        | 8076         |  |  |  | T212B825K020(2)S                               |
| 8.2                                                       | B            | 20                             | T110B825M020AS       | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 10.0                                                      | B            | 5                              | T110B106J020AS       | 1.0                                | 6                                                 | 5032                                                      | 5232       | 5432        | 5632         | 6077                       | 7077        | 8077         |  |  |  | T212B106J020(2)S                               |
| 10.0                                                      | B            | 10                             | T110B106K020AS       | 1.0                                | 6                                                 | 2286                                                      | 2526       | 2766        | 3006         | 6078                       | 7078        | 8078         |  |  |  | T212B106K020(2)S                               |
| 10.0                                                      | B            | 20                             | T110B106M020AS       | 1.0                                | 6                                                 | 2287                                                      | 2527       | 2767        | 3007         | 6079                       | 7079        | 8079         |  |  |  | T212B106M020(2)S                               |
| 12.0                                                      | B            | 5                              | T110B126J020AS       | 1.0                                | 6                                                 | 5033                                                      | 5233       | 5433        | 5633         | 6080                       | 7080        | 8080         |  |  |  | T212B126J020(2)S                               |
| 12.0                                                      | B            | 10                             | T110B126K020AS       | 1.0                                | 6                                                 | 2288                                                      | 2528       | 2768        | 3008         | 6081                       | 7081        | 8081         |  |  |  | T212B126K020(2)S                               |
| 12.0                                                      | B            | 20                             | T110B126M020AS       | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 15.0                                                      | B            | 5                              | T110B156J020AS       | 2.0                                | 6                                                 | 5034                                                      | 5234       | 5434        | 5634         | 6082                       | 7082        | 8082         |  |  |  | T212B156J020(2)S                               |
| 15.0                                                      | B            | 10                             | T110B156K020AS       | 2.0                                | 6                                                 | 2289                                                      | 2529       | 2769        | 3009         | 6083                       | 7083        | 8083         |  |  |  | T212B156K020(2)S                               |
| 15.0                                                      | B            | 20                             | T110B156M020AS       | 2.0                                | 6                                                 | 2290                                                      | 2530       | 2770        | 3010         | 6084                       | 7084        | 8084         |  |  |  | T212B156M020(2)S                               |
| 18.0                                                      | C            | 5,10,20                        | T110C186(1)020AS     | 2.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 22.0                                                      | C            | 5,10,20                        | T110C226(1)020AS     | 2.5                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 27.0                                                      | C            | 5                              | T110C276J020AS       | 2.5                                | 6                                                 | 5035                                                      | 5235       | 5435        | 5635         | 6085                       | 7085        | 8085         |  |  |  | T212C276J020(2)S                               |
| 27.0                                                      | C            | 10                             | T110C276K020AS       | 2.5                                | 6                                                 | 2291                                                      | 2531       | 2771        | 3011         | 6086                       | 7086        | 8086         |  |  |  | T212C276K020(2)S                               |
| 27.0                                                      | C            | 20                             | T110C276M020AS       | 2.5                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 33.0                                                      | C            | 5                              | T110C336J020AS       | 3.0                                | 6                                                 | 5036                                                      | 5236       | 5436        | 5636         | 6087                       | 7087        | 8087         |  |  |  | T212C336J020(2)S                               |
| 33.0                                                      | C            | 10                             | T110C336K020AS       | 3.0                                | 6                                                 | 2292                                                      | 2532       | 2772        | 3012         | 6088                       | 7088        | 8088         |  |  |  | T212C336K020(2)S                               |
| 33.0                                                      | C            | 20                             | T110C336M020AS       | 3.0                                | 6                                                 | 2293                                                      | 2533       | 2773        | 3013         | 6089                       | 7089        | 8089         |  |  |  | T212C336M020(2)S                               |
| 39.0                                                      | C            | 5                              | T110C396J020AS       | 3.0                                | 6                                                 | 5037                                                      | 5237       | 5437        | 5637         | 6090                       | 7090        | 8090         |  |  |  | T212C396J020(2)S                               |
| 39.0                                                      | C            | 10                             | T110C396K020AS       | 3.0                                | 6                                                 | 2294                                                      | 2534       | 2774        | 3014         | 6091                       | 7091        | 8091         |  |  |  | T212C396K020(2)S                               |
| 39.0                                                      | C            | 20                             | T110C396M020AS       | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 47.0                                                      | C            | 5                              | T110C476J020AS       | 4.5                                | 6                                                 | 5038                                                      | 5238       | 5438        | 5638         | 6092                       | 7092        | 8092         |  |  |  | T212C476J020(2)S                               |
| 47.0                                                      | C            | 10                             | T110C476K020AS       | 4.5                                | 6                                                 | 2295                                                      | 2535       | 2775        | 3015         | 6093                       | 7093        | 8093         |  |  |  | T212C476K020(2)S                               |
| 47.0                                                      | C            | 20                             | T110C476M020AS       | 4.5                                | 6                                                 | 2296                                                      | 2536       | 2776        | 3016         | 6094                       | 7094        | 8094         |  |  |  | T212C476M020(2)S                               |
| 56.0                                                      | D            | 5                              | T110D566J020AS       | 5.5                                | 6                                                 | 5039                                                      | 5239       | 5439        | 5639         | 6095                       | 7095        | 8095         |  |  |  | T212D566J020(2)S                               |
| 56.0                                                      | D            | 10                             | T110D566K020AS       | 5.5                                | 6                                                 | 2297                                                      | 2537       | 2777        | 3017         | 6096                       | 7096        | 8096         |  |  |  | T212D566K020(2)S                               |
| 56.0                                                      | D            | 20                             | T110D566M020AS       | 5.5                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 68.0                                                      | D            | 5                              | T110D686J020AS       | 6.0                                | 6                                                 | 5040                                                      | 5240       | 5440        | 5640         | 6097                       | 7097        | 8097         |  |  |  | T212D686J020(2)S                               |
| 68.0                                                      | D            | 10                             | T110D686K020AS       | 6.0                                | 6                                                 | 2298                                                      | 2538       | 2778        | 3018         | 6098                       | 7098        | 8098         |  |  |  | T212D686K020(2)S                               |
| 68.0                                                      | D            | 20                             | T110D686M020AS       | 6.0                                | 6                                                 | 2299                                                      | 2539       | 2779        | 3019         | 6099                       | 7099        | 8099         |  |  |  | T212D686M020(2)S                               |
| 82.0                                                      | D            | 5                              | T110D826J020AS       | 6.0                                | 6                                                 | 5041                                                      | 5241       | 5441        | 5641         | 6100                       | 7100        | 8100         |  |  |  | T212D826J020(2)S                               |
| 82.0                                                      | D            | 10                             | T110D826K020AS       | 6.0                                | 6                                                 | 2300                                                      | 2540       | 2780        | 3020         | 6101                       | 7101        | 8101         |  |  |  | T212D826K020(2)S                               |
| 82.0                                                      | D            | 20                             | T110D826M020AS       | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 100.0                                                     | D            | 5                              | T110D107J020AS       | 10.0                               | 6                                                 | 5042                                                      | 5242       | 5442        | 5642         | 6102                       | 7102        | 8102         |  |  |  | T212D107J020(2)S                               |
| 100.0                                                     | D            | 10                             | T110D107K020AS       | 10.0                               | 6                                                 | 2301                                                      | 2541       | 2781        | 3021         | 6103                       | 7103        | 8103         |  |  |  | T212D107K020(2)S                               |
| 100.0                                                     | D            | 20                             | T110D107M020AS       | 10.0                               | 6                                                 | 2302                                                      | 2542       | 2782        | 3022         | 6104                       | 7104        | 8104         |  |  |  | T212D107M020(2)S                               |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C          |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.0047                                                    | A            | 5,10,20                        | T110A472(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.0056                                                    | A            | 5,10,20                        | T110A562(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.0068                                                    | A            | 5,10,20                        | T110A682(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.0082                                                    | A            | 5,10,20                        | T110A822(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.01                                                      | A            | 5,10,20                        | T110A103(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.012                                                     | A            | 5,10,20                        | T110A123(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.015                                                     | A            | 5,10,20                        | T110A153(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.018                                                     | A            | 5,10,20                        | T110A183(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.022                                                     | A            | 5,10,20                        | T110A223(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.027                                                     | A            | 5,10,20                        | T110A273(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.033                                                     | A            | 5,10,20                        | T110A333(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.039                                                     | A            | 5,10,20                        | T110A393(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.047                                                     | A            | 5,10,20                        | T110A473(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 0.056                                                     | A            | 5,10,20                        | T110A563(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                        | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                          |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                          |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                          |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125° (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.068                                                    | A            | 5,10,20                        | T110A683(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.082                                                    | A            | 5,10,20                        | T110A823(1)035AS     | 0.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.1                                                      | A            | 5,10,20                        | T110A104(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.12                                                     | A            | 5,10,20                        | T110A124(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.15                                                     | A            | 5,10,20                        | T110A154(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.18                                                     | A            | 5,10,20                        | T110A184(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.22                                                     | A            | 5,10,20                        | T110A224(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.27                                                     | A            | 5,10,20                        | T110A274(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.33                                                     | A            | 5,10,20                        | T110A334(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.39                                                     | A            | 5,10,20                        | T110A394(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.47                                                     | A            | 5,10,20                        | T110A474(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.56                                                     | A            | 5,10,20                        | T110A564(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.68                                                     | A            | 5,10,20                        | T110A684(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.82                                                     | A            | 5,10,20                        | T110A824(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.0                                                      | A            | 5,10,20                        | T110A105(1)035AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                                      | B            | 5,10,20                        | T110B125(1)035AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                                      | B            | 5,10,20                        | T110B155(1)035AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.8                                                      | B            | 5,10,20                        | T110B185(1)035AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                                      | B            | 5,10,20                        | T110B225(1)035AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.7                                                      | B            | 5,10,20                        | T110B275(1)035AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.3                                                      | B            | 5,10,20                        | T110B335(1)035AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.9                                                      | B            | 5,10,20                        | T110B395(1)035AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 4.7                                                      | B            | 5,10,20                        | T110B475(1)035AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 5.6                                                      | B            | 5                              | T110B565J035AS       | 1.0                                | 4                                                 | 5043                                                      | 5243       | 5443        | 5643         | 6105                       | 7105        | 8105         | T212B565J035(2)S |                                                |
| 5.6                                                      | B            | 10                             | T110B565K035AS       | 1.0                                | 4                                                 | 2303                                                      | 2543       | 2783        | 3023         | 6106                       | 7106        | 8106         | T212B565K035(2)S |                                                |
| 5.6                                                      | B            | 20                             | T110B565M035AS       | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 6.8                                                      | B            | 5                              | T110B685J035AS       | 1.5                                | 4                                                 | 5044                                                      | 5244       | 5444        | 5644         | 6107                       | 7107        | 8107         | T212B685J035(2)S |                                                |
| 6.8                                                      | B            | 10                             | T110B685K035AS       | 1.5                                | 4                                                 | 2304                                                      | 2544       | 2784        | 3024         | 6108                       | 7108        | 8108         | T212B685K035(2)S |                                                |
| 6.8                                                      | B            | 20                             | T110B685M035AS       | 1.5                                | 4                                                 | 2305                                                      | 2545       | 2785        | 3025         | 6109                       | 7109        | 8109         | T212B685M035(2)S |                                                |
| 8.2                                                      | C            | 5,10,20                        | T110C825(1)035AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                                     | C            | 5,10,20                        | T110C106(1)035AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 12.0                                                     | C            | 5,10,20                        | T110C126(1)035AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                                     | C            | 5,10,20                        | T110C156(1)035AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                                     | C            | 5,10,20                        | T110C186(1)035AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 22.0                                                     | C            | 5                              | T110C226J035AS       | 4.0                                | 4                                                 | 5045                                                      | 5245       | 5445        | 5645         | 6110                       | 7110        | 8110         | T212C226J035(2)S |                                                |
| 22.0                                                     | C            | 10                             | T110C226K035AS       | 4.0                                | 4                                                 | 2306                                                      | 2546       | 2786        | 3026         | 6111                       | 7111        | 8111         | T212C226K035(2)S |                                                |
| 22.0                                                     | C            | 20                             | T110C226M035AS       | 4.0                                | 4                                                 | 2307                                                      | 2547       | 2787        | 3027         | 6112                       | 7112        | 8112         | T212C226M035(2)S |                                                |
| 27.0                                                     | D            | 5                              | T110D276J035AS       | 4.5                                | 4                                                 | 5046                                                      | 5246       | 5446        | 5646         | 6113                       | 7113        | 8113         | T212D276J035(2)S |                                                |
| 27.0                                                     | D            | 10                             | T110D276K035AS       | 4.5                                | 4                                                 | 2308                                                      | 2548       | 2788        | 3028         | 6114                       | 7114        | 8114         | T212D276K035(2)S |                                                |
| 27.0                                                     | D            | 20                             | T110D276M035AS       | 4.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 33.0                                                     | D            | 5                              | T110D336J035AS       | 5.5                                | 4                                                 | 5047                                                      | 5247       | 5447        | 5647         | 6115                       | 7115        | 8115         | T212D336J035(2)S |                                                |
| 33.0                                                     | D            | 10                             | T110D336K035AS       | 5.5                                | 4                                                 | 2309                                                      | 2549       | 2789        | 3029         | 6116                       | 7116        | 8116         | T212D336K035(2)S |                                                |
| 33.0                                                     | D            | 20                             | T110D336M035AS       | 5.5                                | 4                                                 | 2310                                                      | 2550       | 2790        | 3030         | 6117                       | 7117        | 8117         | T212D336M035(2)S |                                                |
| 39.0                                                     | D            | 5                              | T110D396J035AS       | 6.0                                | 4                                                 | 5048                                                      | 5248       | 5448        | 5648         | 6118                       | 7118        | 8118         | T212D396J035(2)S |                                                |
| 39.0                                                     | D            | 10                             | T110D396K035AS       | 6.0                                | 4                                                 | 2311                                                      | 2551       | 2791        | 3031         | 6119                       | 7119        | 8119         | T212D396K035(2)S |                                                |
| 39.0                                                     | D            | 20                             | T110D396M035AS       | 6.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 47.0                                                     | D            | 5                              | T110D476J035AS       | 8.0                                | 4                                                 | 5049                                                      | 5249       | 5449        | 5649         | 6120                       | 7120        | 8120         | T212D476J035(2)S |                                                |
| 47.0                                                     | D            | 10                             | T110D476K035AS       | 8.0                                | 4                                                 | 2312                                                      | 2552       | 2792        | 3032         | 6121                       | 7121        | 8121         | T212D476K035(2)S |                                                |
| 47.0                                                     | D            | 20                             | T110D476M035AS       | 8.0                                | 4                                                 | 2313                                                      | 2553       | 2793        | 3033         | 6122                       | 7122        | 8122         | T212D476M035(2)S |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°          |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0047                                                   | A            | 5                              | T110A472J050AS       | 0.1                                | 2                                                 | 5050                                                      | 5250       | 5450        | 5650         | 6123                       | 7123        | 8123         | T212A472J050(2)S |                                                |
| 0.0047                                                   | A            | 10                             | T110A472K050AS       | 0.1                                | 2                                                 | 2314                                                      | 2554       | 2794        | 3034         | 6124                       | 7124        | 8124         | T212A472K050(2)S |                                                |
| 0.0047                                                   | A            | 20                             | T110A472M050AS       | 0.1                                | 2                                                 | 2315                                                      | 2555       | 2795        | 3035         | 6125                       | 7125        | 8125         | T212A472M050(2)S |                                                |
| 0.0056                                                   | A            | 5                              | T110A562J050AS       | 0.1                                | 2                                                 | 5051                                                      | 5251       | 5451        | 5651         | 6126                       | 7126        | 8126         | T212A562J050(2)S |                                                |
| 0.0056                                                   | A            | 10                             | T110A562K050AS       | 0.1                                | 2                                                 | 2316                                                      | 2556       | 2796        | 3036         | 6127                       | 7127        | 8127         | T212A562K050(2)S |                                                |
| 0.0056                                                   | A            | 20                             | T110A562M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0068                                                   | A            | 5                              | T110A682J050AS       | 0.1                                | 2                                                 | 5052                                                      | 5252       | 5452        | 5652         | 6128                       | 7128        | 8128         | T212A682J050(2)S |                                                |
| 0.0068                                                   | A            | 10                             | T110A682K050AS       | 0.1                                | 2                                                 | 2317                                                      | 2557       | 2797        | 3037         | 6129                       | 7129        | 8129         | T212A682K050(2)S |                                                |
| 0.0068                                                   | A            | 20                             | T110A682M050AS       | 0.1                                | 2                                                 | 2318                                                      | 2558       | 2798        | 3038         | 6130                       | 7130        | 8130         | T212A682M050(2)S |                                                |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

T110 SERIES — POLAR TYPE & T212 (CSR13)

## RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0082                                                    | A            | 5                              | T110A822J050AS       | 0.1                                | 2                                                 | 5053                                                      | 5253       | 5453        | 5653         | 6131                       | 7131        | 8131         | T212A822J050(2)S |                                                |
| 0.0082                                                    | A            | 10                             | T110A822K050AS       | 0.1                                | 2                                                 | 2319                                                      | 2559       | 2799        | 3039         | 6132                       | 7132        | 8132         | T212A822K050(2)S |                                                |
| 0.0082                                                    | A            | 20                             | T110A822M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.01                                                      | A            | 5                              | T110A103J050AS       | 0.1                                | 2                                                 | 5054                                                      | 5254       | 5454        | 5654         | 6133                       | 7133        | 8133         | T212A103J050(2)S |                                                |
| 0.01                                                      | A            | 10                             | T110A103K050AS       | 0.1                                | 2                                                 | 2320                                                      | 2560       | 2800        | 3040         | 6134                       | 7134        | 8134         | T212A103K050(2)S |                                                |
| 0.01                                                      | A            | 20                             | T110A103M050AS       | 0.1                                | 2                                                 | 2321                                                      | 2561       | 2801        | 3041         | 6135                       | 7135        | 8135         | T212A103M050(2)S |                                                |
| 0.012                                                     | A            | 5                              | T110A123J050AS       | 0.1                                | 2                                                 | 5055                                                      | 5255       | 5455        | 5655         | 6136                       | 7136        | 8136         | T212A123J050(2)S |                                                |
| 0.012                                                     | A            | 10                             | T110A123K050AS       | 0.1                                | 2                                                 | 2322                                                      | 2562       | 2802        | 3042         | 6137                       | 7137        | 8137         | T212A123K050(2)S |                                                |
| 0.012                                                     | A            | 20                             | T110A123M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.015                                                     | A            | 5                              | T110A153J050AS       | 0.1                                | 2                                                 | 5056                                                      | 5256       | 5456        | 5656         | 6138                       | 7138        | 8138         | T212A153J050(2)S |                                                |
| 0.015                                                     | A            | 10                             | T110A153K050AS       | 0.1                                | 2                                                 | 2323                                                      | 2563       | 2803        | 3043         | 6139                       | 7139        | 8139         | T212A153K050(2)S |                                                |
| 0.015                                                     | A            | 20                             | T110A153M050AS       | 0.1                                | 2                                                 | 2324                                                      | 2564       | 2804        | 3044         | 6140                       | 7140        | 8140         | T212A153M050(2)S |                                                |
| 0.018                                                     | A            | 5                              | T110A183J050AS       | 0.1                                | 2                                                 | 5057                                                      | 5257       | 5457        | 5657         | 6141                       | 7141        | 8141         | T212A183J050(2)S |                                                |
| 0.018                                                     | A            | 10                             | T110A183K050AS       | 0.1                                | 2                                                 | 2325                                                      | 2565       | 2805        | 3045         | 6142                       | 7142        | 8142         | T212A183K050(2)S |                                                |
| 0.018                                                     | A            | 20                             | T110A183M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.022                                                     | A            | 5                              | T110A223J050AS       | 0.1                                | 2                                                 | 5058                                                      | 5258       | 5458        | 5658         | 6143                       | 7143        | 8143         | T212A223J050(2)S |                                                |
| 0.022                                                     | A            | 10                             | T110A223K050AS       | 0.1                                | 2                                                 | 2326                                                      | 2566       | 2806        | 3046         | 6144                       | 7144        | 8144         | T212A223K050(2)S |                                                |
| 0.022                                                     | A            | 20                             | T110A223M050AS       | 0.1                                | 2                                                 | 2327                                                      | 2567       | 2807        | 3047         | 6145                       | 7145        | 8145         | T212A223M050(2)S |                                                |
| 0.027                                                     | A            | 5                              | T110A273J050AS       | 0.1                                | 2                                                 | 5059                                                      | 5259       | 5459        | 5659         | 6146                       | 7146        | 8146         | T212A273J050(2)S |                                                |
| 0.027                                                     | A            | 10                             | T110A273K050AS       | 0.1                                | 2                                                 | 2328                                                      | 2568       | 2808        | 3048         | 6147                       | 7147        | 8147         | T212A273K050(2)S |                                                |
| 0.027                                                     | A            | 20                             | T110A273M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.033                                                     | A            | 5                              | T110A333J050AS       | 0.1                                | 2                                                 | 5060                                                      | 5260       | 5460        | 5660         | 6148                       | 7148        | 8148         | T212A333J050(2)S |                                                |
| 0.033                                                     | A            | 10                             | T110A333K050AS       | 0.1                                | 2                                                 | 2329                                                      | 2569       | 2809        | 3049         | 6149                       | 7149        | 8149         | T212A333K050(2)S |                                                |
| 0.033                                                     | A            | 20                             | T110A333M050AS       | 0.1                                | 2                                                 | 2330                                                      | 2570       | 2810        | 3050         | 6150                       | 7150        | 8150         | T212A333M050(2)S |                                                |
| 0.039                                                     | A            | 5                              | T110A393J050AS       | 0.1                                | 2                                                 | 5061                                                      | 5261       | 5461        | 5661         | 6151                       | 7151        | 8151         | T212A393J050(2)S |                                                |
| 0.039                                                     | A            | 10                             | T110A393K050AS       | 0.1                                | 2                                                 | 2331                                                      | 2571       | 2811        | 3051         | 6152                       | 7152        | 8152         | T212A393K050(2)S |                                                |
| 0.039                                                     | A            | 20                             | T110A393M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.047                                                     | A            | 5                              | T110A473J050AS       | 0.1                                | 2                                                 | 5062                                                      | 5262       | 5462        | 5662         | 6153                       | 7153        | 8153         | T212A473J050(2)S |                                                |
| 0.047                                                     | A            | 10                             | T110A473K050AS       | 0.1                                | 2                                                 | 2332                                                      | 2572       | 2812        | 3052         | 6154                       | 7154        | 8154         | T212A473K050(2)S |                                                |
| 0.047                                                     | A            | 20                             | T110A473M050AS       | 0.1                                | 2                                                 | 2333                                                      | 2573       | 2813        | 3053         | 6155                       | 7155        | 8155         | T212A473M050(2)S |                                                |
| 0.056                                                     | A            | 5                              | T110A563J050AS       | 0.1                                | 2                                                 | 5063                                                      | 5263       | 5463        | 5663         | 6156                       | 7156        | 8156         | T212A563J050(2)S |                                                |
| 0.056                                                     | A            | 10                             | T110A563K050AS       | 0.1                                | 2                                                 | 2334                                                      | 2574       | 2814        | 3054         | 6157                       | 7157        | 8157         | T212A563K050(2)S |                                                |
| 0.056                                                     | A            | 20                             | T110A563M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.068                                                     | A            | 5                              | T110A683J050AS       | 0.1                                | 2                                                 | 5064                                                      | 5264       | 5464        | 5664         | 6158                       | 7158        | 8158         | T212A683J050(2)S |                                                |
| 0.068                                                     | A            | 10                             | T110A683K050AS       | 0.1                                | 2                                                 | 2335                                                      | 2575       | 2815        | 3055         | 6159                       | 7159        | 8159         | T212A683K050(2)S |                                                |
| 0.068                                                     | A            | 20                             | T110A683M050AS       | 0.1                                | 2                                                 | 2336                                                      | 2576       | 2816        | 3056         | 6160                       | 7160        | 8160         | T212A683M050(2)S |                                                |
| 0.082                                                     | A            | 5                              | T110A823J050AS       | 0.1                                | 2                                                 | 5065                                                      | 5265       | 5465        | 5665         | 6161                       | 7161        | 8161         | T212A823J050(2)S |                                                |
| 0.082                                                     | A            | 10                             | T110A823K050AS       | 0.1                                | 2                                                 | 2337                                                      | 2577       | 2817        | 3057         | 6162                       | 7162        | 8162         | T212A823K050(2)S |                                                |
| 0.082                                                     | A            | 20                             | T110A823M050AS       | 0.1                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.1                                                       | A            | 5                              | T110A104J050AS       | 0.3                                | 2                                                 | 5066                                                      | 5266       | 5466        | 5666         | 6163                       | 7163        | 8163         | T212A104J050(2)S |                                                |
| 0.1                                                       | A            | 10                             | T110A104K050AS       | 0.3                                | 2                                                 | 2338                                                      | 2578       | 2818        | 3058         | 6164                       | 7164        | 8164         | T212A104K050(2)S |                                                |
| 0.1                                                       | A            | 20                             | T110A104M050AS       | 0.3                                | 2                                                 | 2339                                                      | 2579       | 2819        | 3059         | 6165                       | 7165        | 8165         | T212A104M050(2)S |                                                |
| 0.12                                                      | A            | 5                              | T110A124J050AS       | 0.3                                | 2                                                 | 5067                                                      | 5267       | 5467        | 5667         | 6166                       | 7166        | 8166         | T212A124J050(2)S |                                                |
| 0.12                                                      | A            | 10                             | T110A124K050AS       | 0.3                                | 2                                                 | 2340                                                      | 2580       | 2820        | 3060         | 6167                       | 7167        | 8167         | T212A124K050(2)S |                                                |
| 0.12                                                      | A            | 20                             | T110A124M050AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.15                                                      | A            | 5                              | T110A154J050AS       | 0.3                                | 2                                                 | 5068                                                      | 5268       | 5468        | 5668         | 6168                       | 7168        | 8168         | T212A154J050(2)S |                                                |
| 0.15                                                      | A            | 10                             | T110A154K050AS       | 0.3                                | 2                                                 | 2341                                                      | 2581       | 2821        | 3061         | 6169                       | 7169        | 8169         | T212A154K050(2)S |                                                |
| 0.15                                                      | A            | 20                             | T110A154M050AS       | 0.3                                | 2                                                 | 2342                                                      | 2582       | 2822        | 3062         | 6170                       | 7170        | 8170         | T212A154M050(2)S |                                                |
| 0.18                                                      | A            | 5                              | T110A184J050AS       | 0.3                                | 2                                                 | 5069                                                      | 5269       | 5469        | 5669         | 6171                       | 7171        | 8171         | T212A184J050(2)S |                                                |
| 0.18                                                      | A            | 10                             | T110A184K050AS       | 0.3                                | 2                                                 | 2343                                                      | 2583       | 2823        | 3063         | 6172                       | 7172        | 8172         | T212A184K050(2)S |                                                |
| 0.18                                                      | A            | 20                             | T110A184M050AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.22                                                      | A            | 5                              | T110A224J050AS       | 0.3                                | 2                                                 | 5070                                                      | 5270       | 5470        | 5670         | 6173                       | 7173        | 8173         | T212A224J050(2)S |                                                |
| 0.22                                                      | A            | 10                             | T110A224K050AS       | 0.3                                | 2                                                 | 2344                                                      | 2584       | 2824        | 3064         | 6174                       | 7174        | 8174         | T212A224K050(2)S |                                                |
| 0.22                                                      | A            | 20                             | T110A224M050AS       | 0.3                                | 2                                                 | 2345                                                      | 2585       | 2825        | 3065         | 6175                       | 7175        | 8175         | T212A224M050(2)S |                                                |
| 0.27                                                      | A            | 5                              | T110A274J050AS       | 0.3                                | 2                                                 | 5071                                                      | 5271       | 5471        | 5671         | 6176                       | 7176        | 8176         | T212A274J050(2)S |                                                |
| 0.27                                                      | A            | 10                             | T110A274K050AS       | 0.3                                | 2                                                 | 2346                                                      | 2586       | 2826        | 3066         | 6177                       | 7177        | 8177         | T212A274K050(2)S |                                                |
| 0.27                                                      | A            | 20                             | T110A274M050AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.33                                                      | A            | 5                              | T110A334J050AS       | 0.3                                | 2                                                 | 5072                                                      | 5272       | 5472        | 5672         | 6178                       | 7178        | 8178         | T212A334J050(2)S |                                                |
| 0.33                                                      | A            | 10                             | T110A334K050AS       | 0.3                                | 2                                                 | 2347                                                      | 2587       | 2827        | 3067         | 6179                       | 7179        | 8179         | T212A334K050(2)S |                                                |
| 0.33                                                      | A            | 20                             | T110A334M050AS       | 0.3                                | 2                                                 | 2348                                                      | 2588       | 2828        | 3068         | 6180                       | 7180        | 8180         | T212A334M050(2)S |                                                |
| 0.39                                                      | A            | 5                              | T110A394J050AS       | 0.3                                | 2                                                 | 5073                                                      | 5273       | 5473        | 5673         | 6181                       | 7181        | 8181         | T212A394J050(2)S |                                                |

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.39                                                      | A            | 10                             | T110A394K050AS       | 0.3                                | 2                                                 | 2349                                                      | 2589       | 2829        | 3069         | 6182                       | 7182        | 8182         | T212A394K050(2)S |                                                |
| 0.39                                                      | A            | 20                             | T110A394M050AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.47                                                      | A            | 5                              | T110A474J050AS       | 0.3                                | 2                                                 | 5074                                                      | 5274       | 5474        | 5674         | 6183                       | 7183        | 8183         | T212A474J050(2)S |                                                |
| 0.47                                                      | A            | 10                             | T110A474K050AS       | 0.3                                | 2                                                 | 2350                                                      | 2590       | 2830        | 3070         | 6184                       | 7184        | 8184         | T212A474K050(2)S |                                                |
| 0.47                                                      | A            | 20                             | T110A474M050AS       | 0.3                                | 2                                                 | 2351                                                      | 2591       | 2831        | 3071         | 6185                       | 7185        | 8185         | T212A474M050(2)S |                                                |
| 0.56                                                      | A            | 5                              | T110A564J050AS       | 0.3                                | 2                                                 | 5075                                                      | 5275       | 5475        | 5675         | 6186                       | 7186        | 8186         | T212A564J050(2)S |                                                |
| 0.56                                                      | A            | 10                             | T110A564K050AS       | 0.3                                | 2                                                 | 2352                                                      | 2592       | 2832        | 3072         | 6187                       | 7187        | 8187         | T212A564K050(2)S |                                                |
| 0.56                                                      | A            | 20                             | T110A564M050AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.68                                                      | A            | 5                              | T110A684J050AS       | 0.3                                | 2                                                 | 5076                                                      | 5276       | 5476        | 5676         | 6188                       | 7188        | 8188         | T212A684J050(2)S |                                                |
| 0.68                                                      | A            | 10                             | T110A684K050AS       | 0.3                                | 2                                                 | 2353                                                      | 2593       | 2833        | 3073         | 6189                       | 7189        | 8189         | T212A684K050(2)S |                                                |
| 0.68                                                      | A            | 20                             | T110A684M050AS       | 0.3                                | 2                                                 | 2354                                                      | 2594       | 2834        | 3074         | 6190                       | 7190        | 8190         | T212A684M050(2)S |                                                |
| 0.82                                                      | A            | 5                              | T110A824J050AS       | 0.3                                | 2                                                 | 5077                                                      | 5277       | 5477        | 5677         | 6191                       | 7191        | 8191         | T212A824J050(2)S |                                                |
| 0.82                                                      | A            | 10                             | T110A824K050AS       | 0.3                                | 2                                                 | 2355                                                      | 2595       | 2835        | 3075         | 6192                       | 7192        | 8192         | T212A824K050(2)S |                                                |
| 0.82                                                      | A            | 20                             | T110A824M050AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.0                                                       | A            | 5                              | T110A105J050AS       | 0.4                                | 2                                                 | 5078                                                      | 5278       | 5478        | 5678         | 6193                       | 7193        | 8193         | T212A105J050(2)S |                                                |
| 1.0                                                       | A            | 10                             | T110A105K050AS       | 0.4                                | 2                                                 | 2356                                                      | 2596       | 2836        | 3076         | 6194                       | 7194        | 8194         | T212A105K050(2)S |                                                |
| 1.0                                                       | A            | 20                             | T110A105M050AS       | 0.4                                | 2                                                 | 2357                                                      | 2597       | 2837        | 3077         | 6195                       | 7195        | 8195         | T212A105M050(2)S |                                                |
| 1.2                                                       | B            | 5                              | T110B125J050AS       | 0.4                                | 4                                                 | 5079                                                      | 5279       | 5479        | 5679         | 6196                       | 7196        | 8196         | T212B125J050(2)S |                                                |
| 1.2                                                       | B            | 10                             | T110B125K050AS       | 0.4                                | 4                                                 | 2358                                                      | 2598       | 2838        | 3078         | 6197                       | 7197        | 8197         | T212B125K050(2)S |                                                |
| 1.2                                                       | B            | 20                             | T110B125M050AS       | 0.4                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                                       | B            | 5                              | T110B155J050AS       | 0.5                                | 4                                                 | 5080                                                      | 5280       | 5480        | 5680         | 6198                       | 7198        | 8198         | T212B155J050(2)S |                                                |
| 1.5                                                       | B            | 10                             | T110B155K050AS       | 0.5                                | 4                                                 | 2359                                                      | 2599       | 2839        | 3079         | 6199                       | 7199        | 8199         | T212B155K050(2)S |                                                |
| 1.5                                                       | B            | 20                             | T110B155M050AS       | 0.5                                | 4                                                 | 2360                                                      | 2600       | 2840        | 3080         | 6200                       | 7200        | 8200         | T212B155M050(2)S |                                                |
| 1.8                                                       | B            | 5                              | T110B185J050AS       | 0.5                                | 4                                                 | 5081                                                      | 5281       | 5481        | 5681         | 6201                       | 7201        | 8201         | T212B185J050(2)S |                                                |
| 1.8                                                       | B            | 10                             | T110B185K050AS       | 0.5                                | 4                                                 | 2361                                                      | 2601       | 2841        | 3081         | 6202                       | 7202        | 8202         | T212B185K050(2)S |                                                |
| 1.8                                                       | B            | 20                             | T110B185M050AS       | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                                       | B            | 5                              | T110B225J050AS       | 0.8                                | 4                                                 | 5082                                                      | 5282       | 5482        | 5682         | 6203                       | 7203        | 8203         | T212B225J050(2)S |                                                |
| 2.2                                                       | B            | 10                             | T110B225K050AS       | 0.8                                | 4                                                 | 2362                                                      | 2602       | 2842        | 3082         | 6204                       | 7204        | 8204         | T212B225K050(2)S |                                                |
| 2.2                                                       | B            | 20                             | T110B225M050AS       | 0.8                                | 4                                                 | 2363                                                      | 2603       | 2843        | 3083         | 6205                       | 7205        | 8205         | T212B225M050(2)S |                                                |
| 2.7                                                       | B            | 5                              | T110B275J050AS       | 0.8                                | 4                                                 | 5083                                                      | 5283       | 5483        | 5683         | 6206                       | 7206        | 8206         | T212B275J050(2)S |                                                |
| 2.7                                                       | B            | 10                             | T110B275K050AS       | 0.8                                | 4                                                 | 2364                                                      | 2604       | 2844        | 3084         | 6207                       | 7207        | 8207         | T212B275K050(2)S |                                                |
| 2.7                                                       | B            | 20                             | T110B275M050AS       | 0.8                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.3                                                       | B            | 5                              | T110B335J050AS       | 1.2                                | 4                                                 | 5084                                                      | 5284       | 5484        | 5684         | 6208                       | 7208        | 8208         | T212B335J050(2)S |                                                |
| 3.3                                                       | B            | 10                             | T110B335K050AS       | 1.2                                | 4                                                 | 2365                                                      | 2605       | 2845        | 3085         | 6209                       | 7209        | 8209         | T212B335K050(2)S |                                                |
| 3.3                                                       | B            | 20                             | T110B335M050AS       | 1.2                                | 4                                                 | 2366                                                      | 2606       | 2846        | 3086         | 6210                       | 7210        | 8210         | T212B335M050(2)S |                                                |
| 3.9                                                       | B            | 5                              | T110B395J050AS       | 1.5                                | 4                                                 | 5085                                                      | 5285       | 5485        | 5685         | 6211                       | 7211        | 8211         | T212B395J050(2)S |                                                |
| 3.9                                                       | B            | 10                             | T110B395K050AS       | 1.5                                | 4                                                 | 2367                                                      | 2607       | 2847        | 3087         | 6212                       | 7212        | 8212         | T212B395K050(2)S |                                                |
| 3.9                                                       | B            | 20                             | T110B395M050AS       | 1.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 4.7                                                       | B            | 5                              | T110B475J050AS       | 1.7                                | 4                                                 | 5086                                                      | 5286       | 5486        | 5686         | 6213                       | 7213        | 8213         | T212B475J050(2)S |                                                |
| 4.7                                                       | B            | 10                             | T110B475K050AS       | 1.7                                | 4                                                 | 2368                                                      | 2608       | 2848        | 3088         | 6214                       | 7214        | 8214         | T212B475K050(2)S |                                                |
| 4.7                                                       | B            | 20                             | T110B475M050AS       | 1.7                                | 4                                                 | 2369                                                      | 2609       | 2849        | 3089         | 6215                       | 7215        | 8215         | T212B475M050(2)S |                                                |
| 5.6                                                       | C            | 5                              | T110C565J050AS       | 2.2                                | 4                                                 | 5087                                                      | 5287       | 5487        | 5687         | 6216                       | 7216        | 8216         | T212C565J050(2)S |                                                |
| 5.6                                                       | C            | 10                             | T110C565K050AS       | 2.2                                | 4                                                 | 2370                                                      | 2610       | 2850        | 3090         | 6217                       | 7217        | 8217         | T212C565K050(2)S |                                                |
| 5.6                                                       | C            | 20                             | T110C565M050AS       | 2.2                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 6.8                                                       | C            | 5                              | T110C685J050AS       | 2.2                                | 4                                                 | 5088                                                      | 5288       | 5488        | 5688         | 6218                       | 7218        | 8218         | T212C685J050(2)S |                                                |
| 6.8                                                       | C            | 10                             | T110C685K050AS       | 2.2                                | 4                                                 | 2371                                                      | 2611       | 2851        | 3091         | 6219                       | 7219        | 8219         | T212C685K050(2)S |                                                |
| 6.8                                                       | C            | 20                             | T110C685M050AS       | 2.2                                | 4                                                 | 2372                                                      | 2612       | 2852        | 3092         | 6220                       | 7220        | 8220         | T212C685M050(2)S |                                                |
| 8.2                                                       | C            | 5                              | T110C825J050AS       | 2.5                                | 4                                                 | 5089                                                      | 5289       | 5489        | 5689         | 6221                       | 7221        | 8221         | T212C825J050(2)S |                                                |
| 8.2                                                       | C            | 10                             | T110C825K050AS       | 2.5                                | 4                                                 | 2373                                                      | 2613       | 2853        | 3093         | 6222                       | 7222        | 8222         | T212C825K050(2)S |                                                |
| 8.2                                                       | C            | 20                             | T110C825M050AS       | 2.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                                      | C            | 5                              | T110C106J050AS       | 2.5                                | 4                                                 | 5090                                                      | 5290       | 5490        | 5690         | 6223                       | 7223        | 8223         | T212C106J050(2)S |                                                |
| 10.0                                                      | C            | 10                             | T110C106K050AS       | 2.5                                | 4                                                 | 2374                                                      | 2614       | 2854        | 3094         | 6224                       | 7224        | 8224         | T212C106K050(2)S |                                                |
| 10.0                                                      | C            | 20                             | T110C106M050AS       | 2.5                                | 4                                                 | 2375                                                      | 2615       | 2855        | 3095         | 6225                       | 7225        | 8225         | T212C106M050(2)S |                                                |
| 12.0                                                      | C            | 5                              | T110C126J050AS       | 3.0                                | 4                                                 | 5091                                                      | 5291       | 5491        | 5691         | 6226                       | 7226        | 8226         | T212C126J050(2)S |                                                |
| 12.0                                                      | C            | 10                             | T110C126K050AS       | 3.0                                | 4                                                 | 2376                                                      | 2616       | 2856        | 3096         | 6227                       | 7227        | 8227         | T212C126K050(2)S |                                                |
| 12.0                                                      | C            | 20                             | T110C126M050AS       | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                                      | C            | 5                              | T110C156J050AS       | 4.0                                | 4                                                 | 5092                                                      | 5292       | 5492        | 5692         | 6228                       | 7228        | 8228         | T212C156J050(2)S |                                                |
| 15.0                                                      | C            | 10                             | T110C156K050AS       | 4.0                                | 4                                                 | 2377                                                      | 2617       | 2857        | 3097         | 6229                       | 7229        | 8229         | T212C156K050(2)S |                                                |
| 15.0                                                      | C            | 20                             | T110C156M050AS       | 4.0                                | 4                                                 | 2378                                                      | 2618       | 2858        | 3098         | 6230                       | 7230        | 8230         | T212C156M050(2)S |                                                |
| 18.0                                                      | C            | 5                              | T110C186J050AS       | 4.5                                | 4                                                 | 5093                                                      | 5293       | 5493        | 5693         | 6231                       | 7231        | 8231         | T212C186J050(2)S |                                                |

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part type and values.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T110 SERIES — POLAR TYPE & T212 (CSR13)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                                      | C            | 10                             | T110C186K050AS       | 4.5                                | 4                                                 | 2379                                                      | 2619       | 2859        | 3099         | 6232                       | 7232        | 8232         | T212C186K050(2)S |                                                |
| 18.0                                                      | C            | 20                             | T110C186M050AS       | 4.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 22.0                                                      | D            | 5                              | T110D226J050AS       | 5.5                                | 4                                                 | 5094                                                      | 5294       | 5494        | 5694         | 6233                       | 7233        | 8233         | T212D226J050(2)S |                                                |
| 22.0                                                      | D            | 10                             | T110D226K050AS       | 5.5                                | 4                                                 | 2380                                                      | 2620       | 2860        | 3100         | 6234                       | 7234        | 8234         | T212D226K050(2)S |                                                |
| 22.0                                                      | D            | 20                             | T110D226M050AS       | 5.5                                | 4                                                 | 2381                                                      | 2621       | 2861        | 3101         | 6235                       | 7235        | 8235         | T212D226M050(2)S |                                                |
| 60 VOLT RATING AT 85°C — 40 VOLT RATING AT 125°C          |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0047                                                    | A            | 5,10,20                        | T110A472(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0056                                                    | A            | 5,10,20                        | T110A562(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0068                                                    | A            | 5,10,20                        | T110A682(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0082                                                    | A            | 5,10,20                        | T110A822(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.01                                                      | A            | 5,10,20                        | T110A103(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.012                                                     | A            | 5,10,20                        | T110A123(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.015                                                     | A            | 5,10,20                        | T110A153(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.018                                                     | A            | 5,10,20                        | T110A183(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.022                                                     | A            | 5,10,20                        | T110A223(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.027                                                     | A            | 5,10,20                        | T110A273(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.033                                                     | A            | 5,10,20                        | T110A333(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.039                                                     | A            | 5,10,20                        | T110A393(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.047                                                     | A            | 5,10,20                        | T110A473(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.056                                                     | A            | 5,10,20                        | T110A563(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.068                                                     | A            | 5,10,20                        | T110A683(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.082                                                     | A            | 5,10,20                        | T110A823(1)060AS     | 0.3                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.1                                                       | A            | 5,10,20                        | T110A104(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.12                                                      | A            | 5,10,20                        | T110A124(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.15                                                      | A            | 5,10,20                        | T110A154(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.18                                                      | A            | 5,10,20                        | T110A184(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.22                                                      | A            | 5,10,20                        | T110A224(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.27                                                      | A            | 5,10,20                        | T110A274(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.33                                                      | A            | 5,10,20                        | T110A334(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.39                                                      | A            | 5,10,20                        | T110A394(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.47                                                      | A            | 5,10,20                        | T110A474(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.56                                                      | A            | 5,10,20                        | T110A564(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.68                                                      | A            | 5,10,20                        | T110A684(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.82                                                      | B            | 5,10,20                        | T110B824(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.0                                                       | B            | 5,10,20                        | T110B105(1)060AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                                       | B            | 5,10,20                        | T110B125(1)060AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                                       | B            | 5,10,20                        | T110B155(1)060AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.8                                                       | B            | 5,10,20                        | T110B185(1)060AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                                       | B            | 5,10,20                        | T110B225(1)060AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.7                                                       | B            | 5,10,20                        | T110B275(1)060AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.3                                                       | B            | 5,10,20                        | T110B335(1)060AS     | 1.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.9                                                       | B            | 5,10,20                        | T110B395(1)060AS     | 1.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 4.7                                                       | C            | 5,10,20                        | T110C475(1)060AS     | 2.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 5.6                                                       | C            | 5,10,20                        | T110C565(1)060AS     | 2.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 6.8                                                       | C            | 5,10,20                        | T110C685(1)060AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 8.2                                                       | C            | 5,10,20                        | T110C825(1)060AS     | 4.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                                      | C            | 5,10,20                        | T110C106(1)060AS     | 5.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 12.0                                                      | C            | 5,10,20                        | T110C126(1)060AS     | 5.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                                      | D            | 5,10,20                        | T110D156(1)060AS     | 4.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                                      | D            | 5,10,20                        | T110D186(1)060AS     | 5.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 22.0                                                      | D            | 5,10,20                        | T110D226(1)060AS     | 6.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C          |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0047                                                    | A            | 5,10,20                        | T110A472(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0056                                                    | A            | 5,10,20                        | T110A562(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0068                                                    | A            | 5,10,20                        | T110A682(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0082                                                    | A            | 5,10,20                        | T110A822(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.01                                                      | A            | 5,10,20                        | T110A103(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  |  |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|--|--|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |  |  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |  |  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |  |  |                                                |
| 75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.012                                                     | A            | 5,10,20                        | T110A123(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.015                                                     | A            | 5,10,20                        | T110A153(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.018                                                     | A            | 5,10,20                        | T110A183(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.022                                                     | A            | 5,10,20                        | T110A223(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.027                                                     | A            | 5,10,20                        | T110A273(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.033                                                     | A            | 5,10,20                        | T110A333(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.039                                                     | A            | 5,10,20                        | T110A393(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.047                                                     | A            | 5,10,20                        | T110A473(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.056                                                     | A            | 5,10,20                        | T110A563(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.068                                                     | A            | 5,10,20                        | T110A683(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.082                                                     | A            | 5,10,20                        | T110A823(1)075AS     | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.1                                                       | A            | 5                              | T110A104J075AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.1                                                       | A            | 10                             | T110A104K075AS       | 0.3                                | 2                                                 | 5095                                                      | 5295       | 5495        | 5695         | 6236                       | 7236        | 8236         | T212A104J075(2)S |  |  |                                                |
| 0.1                                                       | A            | 20                             | T110A104M075AS       | 0.3                                | 2                                                 | 2382                                                      | 2622       | 2862        | 3102         | 6237                       | 7237        | 8237         | T212A104K075(2)S |  |  |                                                |
| 0.12                                                      | A            | 5                              | T110A124J075AS       | 0.3                                | 2                                                 | 2383                                                      | 2623       | 2863        | 3103         | 6238                       | 7238        | 8238         | T212A104M075(2)S |  |  |                                                |
| 0.12                                                      | A            | 10                             | T110A124K075AS       | 0.3                                | 2                                                 | 5096                                                      | 5296       | 5496        | 5696         | 6239                       | 7239        | 8239         | T212A124J075(2)S |  |  |                                                |
| 0.12                                                      | A            | 20                             | T110A124M075AS       | 0.3                                | 2                                                 | 2384                                                      | 2624       | 2864        | 3104         | 6240                       | 7240        | 8240         | T212A124K075(2)S |  |  |                                                |
| 0.15                                                      | A            | 5                              | T110A154J075AS       | 0.3                                | 2                                                 | 5097                                                      | 5297       | 5497        | 5697         | 6241                       | 7241        | 8241         | T212A154J075(2)S |  |  |                                                |
| 0.15                                                      | A            | 10                             | T110A154K075AS       | 0.3                                | 2                                                 | 2385                                                      | 2625       | 2865        | 3105         | 6242                       | 7242        | 8242         | T212A154K075(2)S |  |  |                                                |
| 0.15                                                      | A            | 20                             | T110A154M075AS       | 0.3                                | 2                                                 | 2386                                                      | 2626       | 2866        | 3106         | 6243                       | 7243        | 8243         | T212A154M075(2)S |  |  |                                                |
| 0.18                                                      | A            | 5                              | T110A184J075AS       | 0.3                                | 2                                                 | 5098                                                      | 5298       | 5498        | 5698         | 6244                       | 7244        | 8244         | T212A184J075(2)S |  |  |                                                |
| 0.18                                                      | A            | 10                             | T110A184K075AS       | 0.3                                | 2                                                 | 2387                                                      | 2627       | 2867        | 3107         | 6245                       | 7245        | 8245         | T212A184K075(2)S |  |  |                                                |
| 0.18                                                      | A            | 20                             | T110A184M075AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.22                                                      | A            | 5                              | T110A224J075AS       | 0.3                                | 2                                                 | 5099                                                      | 5299       | 5499        | 5699         | 6246                       | 7246        | 8246         | T212A224J075(2)S |  |  |                                                |
| 0.22                                                      | A            | 10                             | T110A224K075AS       | 0.3                                | 2                                                 | 2388                                                      | 2628       | 2868        | 3108         | 6247                       | 7247        | 8247         | T212A224K075(2)S |  |  |                                                |
| 0.22                                                      | A            | 20                             | T110A224M075AS       | 0.3                                | 2                                                 | 2389                                                      | 2629       | 2869        | 3109         | 6248                       | 7248        | 8248         | T212A224M075(2)S |  |  |                                                |
| 0.27                                                      | A            | 5                              | T110A274J075AS       | 0.3                                | 2                                                 | 5100                                                      | 5300       | 5500        | 5700         | 6249                       | 7249        | 8249         | T212A274J075(2)S |  |  |                                                |
| 0.27                                                      | A            | 10                             | T110A274K075AS       | 0.3                                | 2                                                 | 2390                                                      | 2630       | 2870        | 3110         | 6250                       | 7250        | 8250         | T212A274K075(2)S |  |  |                                                |
| 0.27                                                      | A            | 20                             | T110A274M075AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.33                                                      | A            | 5                              | T110A334J075AS       | 0.3                                | 2                                                 | 5101                                                      | 5301       | 5501        | 5701         | 6251                       | 7251        | 8251         | T212A334J075(2)S |  |  |                                                |
| 0.33                                                      | A            | 10                             | T110A334K075AS       | 0.3                                | 2                                                 | 2391                                                      | 2631       | 2871        | 3111         | 6252                       | 7252        | 8252         | T212A334K075(2)S |  |  |                                                |
| 0.33                                                      | A            | 20                             | T110A334M075AS       | 0.3                                | 2                                                 | 2392                                                      | 2632       | 2872        | 3112         | 6253                       | 7253        | 8253         | T212A334M075(2)S |  |  |                                                |
| 0.39                                                      | A            | 5                              | T110A394J075AS       | 0.3                                | 2                                                 | 5102                                                      | 5302       | 5502        | 5702         | 6254                       | 7254        | 8254         | T212A394J075(2)S |  |  |                                                |
| 0.39                                                      | A            | 10                             | T110A394K075AS       | 0.3                                | 2                                                 | 2393                                                      | 2633       | 2873        | 3113         | 6255                       | 7255        | 8255         | T212A394K075(2)S |  |  |                                                |
| 0.39                                                      | A            | 20                             | T110A394M075AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.47                                                      | A            | 5                              | T110A474J075AS       | 0.3                                | 2                                                 | 5103                                                      | 5303       | 5503        | 5703         | 6256                       | 7256        | 8256         | T212A474J075(2)S |  |  |                                                |
| 0.47                                                      | A            | 10                             | T110A474K075AS       | 0.3                                | 2                                                 | 2394                                                      | 2634       | 2874        | 3114         | 6257                       | 7257        | 8257         | T212A474K075(2)S |  |  |                                                |
| 0.47                                                      | A            | 20                             | T110A474M075AS       | 0.3                                | 2                                                 | 2395                                                      | 2635       | 2875        | 3115         | 6258                       | 7258        | 8258         | T212A474M075(2)S |  |  |                                                |
| 0.56                                                      | A            | 5                              | T110A564J075AS       | 0.3                                | 2                                                 | 5104                                                      | 5304       | 5504        | 5704         | 6259                       | 7259        | 8259         | T212A564J075(2)S |  |  |                                                |
| 0.56                                                      | A            | 10                             | T110A564K075AS       | 0.3                                | 2                                                 | 2396                                                      | 2636       | 2876        | 3116         | 6260                       | 7260        | 8260         | T212A564K075(2)S |  |  |                                                |
| 0.56                                                      | A            | 20                             | T110A564M075AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 0.68                                                      | A            | 5                              | T110A684J075AS       | 0.3                                | 2                                                 | 5105                                                      | 5305       | 5505        | 5705         | 6261                       | 7261        | 8261         | T212A684J075(2)S |  |  |                                                |
| 0.68                                                      | A            | 10                             | T110A684K075AS       | 0.3                                | 2                                                 | 2397                                                      | 2637       | 2877        | 3117         | 6262                       | 7262        | 8262         | T212A684K075(2)S |  |  |                                                |
| 0.68                                                      | A            | 20                             | T110A684M075AS       | 0.3                                | 2                                                 | 2398                                                      | 2638       | 2878        | 3118         | 6263                       | 7263        | 8263         | T212A684M075(2)S |  |  |                                                |
| 0.82                                                      | B            | 5                              | T110B824J075AS       | 0.3                                | 2                                                 | 5106                                                      | 5306       | 5506        | 5706         | 6264                       | 7264        | 8264         | T212B824J075(2)S |  |  |                                                |
| 0.82                                                      | B            | 10                             | T110B824K075AS       | 0.3                                | 2                                                 | 2399                                                      | 2639       | 2879        | 3119         | 6265                       | 7265        | 8265         | T212B824K075(2)S |  |  |                                                |
| 0.82                                                      | B            | 20                             | T110B824M075AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 1.0                                                       | B            | 5                              | T110B105J075AS       | 0.3                                | 2                                                 | 5107                                                      | 5307       | 5507        | 5707         | 6266                       | 7266        | 8266         | T212B105J075(2)S |  |  |                                                |
| 1.0                                                       | B            | 10                             | T110B105K075AS       | 0.3                                | 2                                                 | 2400                                                      | 2640       | 2880        | 3120         | 6267                       | 7267        | 8267         | T212B105K075(2)S |  |  |                                                |
| 1.0                                                       | B            | 20                             | T110B105M075AS       | 0.3                                | 2                                                 | 2401                                                      | 2641       | 2881        | 3121         | 6268                       | 7268        | 8268         | T212B105M075(2)S |  |  |                                                |
| 1.2                                                       | B            | 5                              | T110B125J075AS       | 0.3                                | 4                                                 | 5108                                                      | 5308       | 5508        | 5708         | 6269                       | 7269        | 8269         | T212B125J075(2)S |  |  |                                                |
| 1.2                                                       | B            | 10                             | T110B125K075AS       | 0.3                                | 4                                                 | 2402                                                      | 2642       | 2882        | 3122         | 6270                       | 7270        | 8270         | T212B125K075(2)S |  |  |                                                |
| 1.2                                                       | B            | 20                             | T110B125M075AS       | 0.3                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 1.5                                                       | B            | 5                              | T110B155J075AS       | 0.6                                | 4                                                 | 5109                                                      | 5309       | 5509        | 5709         | 6271                       | 7271        | 8271         | T212B155J075(2)S |  |  |                                                |
| 1.5                                                       | B            | 10                             | T110B155K075AS       | 0.6                                | 4                                                 | 2403                                                      | 2643       | 2883        | 3123         | 6272                       | 7272        | 8272         | T212B155K075(2)S |  |  |                                                |
| 1.5                                                       | B            | 20                             | T110B155M075AS       | 0.6                                | 4                                                 | 2404                                                      | 2644       | 2884        | 3124         | 6273                       | 7273        | 8273         | T212B155M075(2)S |  |  |                                                |
| 1.8                                                       | B            | 5                              | T110B185J075AS       | 0.7                                | 4                                                 | 5110                                                      | 5310       | 5510        | 5710         | 6274                       | 7274        | 8274         | T212B185J075(2)S |  |  |                                                |
| 1.8                                                       | B            | 10                             | T110B185K075AS       | 0.7                                | 4                                                 | 2405                                                      | 2645       | 2885        | 3125         | 6275                       | 7275        | 8275         | T212B185K075(2)S |  |  |                                                |
| 1.8                                                       | B            | 20                             | T110B185M075AS       | 0.7                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 2.2                                                       | B            | 5                              | T110B225J075AS       | 0.8                                | 4                                                 | 5111                                                      | 5311       | 5511        | 5711         | 6276                       | 7276        | 8276         | T212B225J075(2)S |  |  |                                                |
| 2.2                                                       | B            | 10                             | T110B225K075AS       | 0.8                                | 4                                                 | 2406                                                      | 2646       | 2886        | 3126         | 6277                       | 7277        | 8277         | T212B225K075(2)S |  |  |                                                |

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

Bold Face lines indicate popular part types and values.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T110 SERIES — POLAR TYPE & T212 (CSR13)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                           |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                                       | B            | 20                             | T110B225M075AS       | 0.8                                | 4                                                 | 2407                                                      | 2647       | 2887        | 3127         | 6278                       | 7278        | 8278         | T212B225M075(2)S |                                                |
| 2.7                                                       | B            | 5                              | T110B275J075AS       | 1.0                                | 4                                                 | 5112                                                      | 5312       | 5512        | 5712         | 6279                       | 7279        | 8279         | T212B275J075(2)S |                                                |
| 2.7                                                       | B            | 10                             | T110B275K075AS       | 1.0                                | 4                                                 | 2408                                                      | 2648       | 2888        | 3128         | 6280                       | 7280        | 8280         | T212B275K075(2)S |                                                |
| 2.7                                                       | B            | 20                             | T110B275M075AS       | 1.2                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.3                                                       | B            | 5                              | T110B335J075AS       | 1.2                                | 4                                                 | 5113                                                      | 5313       | 5513        | 5713         | 6281                       | 7281        | 8281         | T212B335J075(2)S |                                                |
| 3.3                                                       | B            | 10                             | T110B335K075AS       | 1.2                                | 4                                                 | 2409                                                      | 2649       | 2889        | 3129         | 6282                       | 7282        | 8282         | T212B335K075(2)S |                                                |
| 3.3                                                       | B            | 20                             | T110B335M075AS       | 1.2                                | 4                                                 | 2410                                                      | 2650       | 2890        | 3130         | 6283                       | 7283        | 8283         | T212B335M075(2)S |                                                |
| 3.9                                                       | B            | 5                              | T110B395J075AS       | 1.5                                | 4                                                 | 5114                                                      | 5314       | 5514        | 5714         | 6284                       | 7284        | 8284         | T212B395J075(2)S |                                                |
| 3.9                                                       | B            | 10                             | T110B395K075AS       | 1.5                                | 4                                                 | 2411                                                      | 2651       | 2891        | 3131         | 6285                       | 7285        | 8285         | T212B395K075(2)S |                                                |
| 3.9                                                       | B            | 20                             | T110B395M075AS       | 1.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 4.7                                                       | C            | 5                              | T110C475J075AS       | 3.0                                | 4                                                 | 5115                                                      | 5315       | 5515        | 5715         | 6286                       | 7286        | 8286         | T212C475J075(2)S |                                                |
| 4.7                                                       | C            | 10                             | T110C475K075AS       | 3.0                                | 4                                                 | 2412                                                      | 2652       | 2892        | 3132         | 6287                       | 7287        | 8287         | T212C475K075(2)S |                                                |
| 4.7                                                       | C            | 20                             | T110C475M075AS       | 3.0                                | 4                                                 | 2413                                                      | 2653       | 2893        | 3133         | 6288                       | 7288        | 8288         | T212C475M075(2)S |                                                |
| 5.6                                                       | C            | 5                              | T110C565J075AS       | 3.0                                | 4                                                 | 5116                                                      | 5316       | 5516        | 5716         | 6289                       | 7289        | 8289         | T212C565J075(2)S |                                                |
| 5.6                                                       | C            | 10                             | T110C565K075AS       | 3.0                                | 4                                                 | 2414                                                      | 2654       | 2894        | 3134         | 6290                       | 7290        | 8290         | T212C565K075(2)S |                                                |
| 5.6                                                       | C            | 20                             | T110C565M075AS       | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 6.8                                                       | C            | 5                              | T110C685J075AS       | 5.0                                | 4                                                 | 5117                                                      | 5317       | 5517        | 5717         | 6291                       | 7291        | 8291         | T212C685J075(2)S |                                                |
| 6.8                                                       | C            | 10                             | T110C685K075AS       | 5.0                                | 4                                                 | 2415                                                      | 2655       | 2895        | 3135         | 6292                       | 7292        | 8292         | T212C685K075(2)S |                                                |
| 6.8                                                       | C            | 20                             | T110C685M075AS       | 5.0                                | 4                                                 | 2416                                                      | 2656       | 2896        | 3136         | 6293                       | 7293        | 8293         | T212C685M075(2)S |                                                |
| 8.2                                                       | C            | 5                              | T110C825J075AS       | 5.0                                | 4                                                 | 5118                                                      | 5318       | 5518        | 5718         | 6294                       | 7294        | 8294         | T212C825J075(2)S |                                                |
| 8.2                                                       | C            | 10                             | T110C825K075AS       | 5.0                                | 4                                                 | 2417                                                      | 2657       | 2897        | 3137         | 6295                       | 7295        | 8295         | T212C825K075(2)S |                                                |
| 8.2                                                       | C            | 20                             | T110C825M075AS       | 5.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                                      | C            | 5                              | T110C106J075AS       | 5.0                                | 4                                                 | 5119                                                      | 5319       | 5519        | 5719         | 6296                       | 7296        | 8296         | T212C106J075(2)S |                                                |
| 10.0                                                      | C            | 10                             | T110C106K075AS       | 5.0                                | 4                                                 | 2418                                                      | 2658       | 2898        | 3138         | 6297                       | 7297        | 8297         | T212C106K075(2)S |                                                |
| 10.0                                                      | C            | 20                             | T110C106M075AS       | 5.0                                | 4                                                 | 2419                                                      | 2659       | 2899        | 3139         | 6298                       | 7298        | 8298         | T212C106M075(2)S |                                                |
|                                                           |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 12.0                                                      | D            | 5                              | T110D126J075AS       | 5.0                                | 4                                                 | 5120                                                      | 5320       | 5520        | 5720         | 6299                       | 7299        | 8299         | T212D126J075(2)S |                                                |
| 12.0                                                      | D            | 10                             | T110D126K075AS       | 5.0                                | 4                                                 | 2420                                                      | 2660       | 2900        | 3140         | 6300                       | 7300        | 8300         | T212D126K075(2)S |                                                |
| 12.0                                                      | D            | 20                             | T110D126M075AS       | 5.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                                      | D            | 5                              | T110D156J075AS       | 7.0                                | 4                                                 | 5121                                                      | 5321       | 5521        | 5721         | 6301                       | 7301        | 8301         | T212D156J075(2)S |                                                |
| 15.0                                                      | D            | 10                             | T110D156K075AS       | 7.0                                | 4                                                 | 2421                                                      | 2661       | 2901        | 3141         | 6302                       | 7302        | 8302         | T212D156K075(2)S |                                                |
| 15.0                                                      | D            | 20                             | T110D156M075AS       | 7.0                                | 4                                                 | 2422                                                      | 2662       | 2902        | 3142         | 6303                       | 7303        | 8303         | T212D156M075(2)S |                                                |
|                                                           |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 100 VOLT RATING AT 85°C — 67 VOLT RATING AT 125°          |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0047                                                    | A            | 5                              | T110A472J100AS       | 0.3                                | 2                                                 | 5122                                                      | 5322       | 5522        | 5722         | 6304                       | 7304        | *            | T212A472J100(2)S |                                                |
| 0.0047                                                    | A            | 10                             | T110A472K100AS       | 0.3                                | 2                                                 | 2423                                                      | 2663       | 2903        | 3143         | 6305                       | 7305        | *            | T212A472K100(2)S |                                                |
| 0.0047                                                    | A            | 20                             | T110A472M100AS       | 0.3                                | 2                                                 | 2424                                                      | 2664       | 2904        | 3144         | 6306                       | 7306        | *            | T212A472M100(2)S |                                                |
| 0.0056                                                    | A            | 5                              | T110A562J100AS       | 0.3                                | 2                                                 | 5123                                                      | 5323       | 5523        | 5723         | 6307                       | 7307        | *            | T212A562J100(2)S |                                                |
| 0.0056                                                    | A            | 10                             | T110A562K100AS       | 0.3                                | 2                                                 | 2425                                                      | 2665       | 2905        | 3145         | 6308                       | 7308        | *            | T212A562K100(2)S |                                                |
| 0.0056                                                    | A            | 20                             | T110A562M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0068                                                    | A            | 5                              | T110A682J100AS       | 0.3                                | 2                                                 | 5124                                                      | 5324       | 5524        | 5724         | 6309                       | 7309        | *            | T212A682J100(2)S |                                                |
| 0.0068                                                    | A            | 10                             | T110A682K100AS       | 0.3                                | 2                                                 | 2426                                                      | 2666       | 2906        | 3146         | 6310                       | 7310        | *            | T212A682K100(2)S |                                                |
| 0.0068                                                    | A            | 20                             | T110A682M100AS       | 0.3                                | 2                                                 | 2427                                                      | 2667       | 2907        | 3147         | 6311                       | 7311        | *            | T212A682M100(2)S |                                                |
| 0.0082                                                    | A            | 5                              | T110A822J100AS       | 0.3                                | 2                                                 | 5125                                                      | 5325       | 5525        | 5725         | 6312                       | 7312        | *            | T212A822J100(2)S |                                                |
| 0.0082                                                    | A            | 10                             | T110A822K100AS       | 0.3                                | 2                                                 | 2428                                                      | 2668       | 2908        | 3148         | 6313                       | 7313        | *            | T212A822K100(2)S |                                                |
| 0.0082                                                    | A            | 20                             | T110A822M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.01                                                      | A            | 5                              | T110A103J100AS       | 0.3                                | 2                                                 | 5126                                                      | 5326       | 5526        | 5726         | 6314                       | 7314        | *            | T212A103J100(2)S |                                                |
| 0.01                                                      | A            | 10                             | T110A103K100AS       | 0.3                                | 2                                                 | 2429                                                      | 2669       | 2909        | 3149         | 6315                       | 7315        | *            | T212A103K100(2)S |                                                |
| 0.01                                                      | A            | 20                             | T110A103M100AS       | 0.3                                | 2                                                 | 2430                                                      | 2670       | 2910        | 3150         | 6316                       | 7316        | *            | T212A103M100(2)S |                                                |
| 0.012                                                     | A            | 5                              | T110A123J100AS       | 0.3                                | 2                                                 | 5127                                                      | 5327       | 5527        | 5727         | 6317                       | 7317        | *            | T212A123J100(2)S |                                                |
| 0.012                                                     | A            | 10                             | T110A123K100AS       | 0.3                                | 2                                                 | 2431                                                      | 2671       | 2911        | 3151         | 6318                       | 7318        | *            | T212A123K100(2)S |                                                |
| 0.012                                                     | A            | 20                             | T110A123M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.015                                                     | A            | 5                              | T110A153J100AS       | 0.3                                | 2                                                 | 5128                                                      | 5328       | 5528        | 5728         | 6319                       | 7319        | *            | T212A153J100(2)S |                                                |
| 0.015                                                     | A            | 10                             | T110A153K100AS       | 0.3                                | 2                                                 | 2432                                                      | 2672       | 2912        | 3152         | 6320                       | 7320        | *            | T212A153K100(2)S |                                                |
| 0.015                                                     | A            | 20                             | T110A153M100AS       | 0.3                                | 2                                                 | 2433                                                      | 2673       | 2913        | 3153         | 6321                       | 7321        | *            | T212A153M100(2)S |                                                |
| 0.018                                                     | A            | 5                              | T110A183J100AS       | 0.3                                | 2                                                 | 5129                                                      | 5329       | 5529        | 5729         | 6322                       | 7322        | *            | T212A183J100(2)S |                                                |
| 0.018                                                     | A            | 10                             | T110A183K100AS       | 0.3                                | 2                                                 | 2434                                                      | 2674       | 2914        | 3154         | 6323                       | 7323        | *            | T212A183K100(2)S |                                                |
| 0.018                                                     | A            | 20                             | T110A183M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.022                                                     | A            | 5                              | T110A223J100AS       | 0.3                                | 2                                                 | 5130                                                      | 5330       | 5530        | 5730         | 6324                       | 7324        | *            | T212A223J100(2)S |                                                |
| 0.022                                                     | A            | 10                             | T110A223K100AS       | 0.3                                | 2                                                 | 2435                                                      | 2675       | 2915        | 3155         | 6325                       | 7325        | *            | T212A223K100(2)S |                                                |

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

\*Note: D Failure Rate — Not QPL for -8304 thru -8401.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                          | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|------------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                            |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                            |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                            |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 100 VOLT RATING AT 85°C — 67 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.022                                                      | A            | 20                             | T110A223M100AS       | 0.3                                | 2                                                 | 2436                                                      | 2676       | 2916        | 3156         | 6326                       | 7326        | *            | T212A223M100(2)S |                                                |
| 0.027                                                      | A            | 5                              | T110A273J100AS       | 0.3                                | 2                                                 | 5131                                                      | 5331       | 5531        | 5731         | 6327                       | 7327        | *            | T212A273J100(2)S |                                                |
| 0.027                                                      | A            | 10                             | T110A273K100AS       | 0.3                                | 2                                                 | 2437                                                      | 2677       | 2917        | 3157         | 6328                       | 7328        | *            | T212A273K100(2)S |                                                |
| 0.027                                                      | A            | 20                             | T110A273M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.033                                                      | A            | 5                              | T110A333J100AS       | 0.3                                | 2                                                 | 5132                                                      | 5332       | 5532        | 5732         | 6329                       | 7329        | *            | T212A333J100(2)S |                                                |
| 0.033                                                      | A            | 10                             | T110A333K100AS       | 0.3                                | 2                                                 | 2438                                                      | 2678       | 2918        | 3158         | 6330                       | 7330        | *            | T212A333K100(2)S |                                                |
| 0.033                                                      | A            | 20                             | T110A333M100AS       | 0.3                                | 2                                                 | 2439                                                      | 2679       | 2919        | 3159         | 6331                       | 7331        | *            | T212A333M100(2)S |                                                |
| 0.039                                                      | A            | 5                              | T110A393J100AS       | 0.3                                | 2                                                 | 5133                                                      | 5333       | 5533        | 5733         | 6332                       | 7332        | *            | T212A393J100(2)S |                                                |
| 0.039                                                      | A            | 10                             | T110A393K100AS       | 0.3                                | 2                                                 | 2440                                                      | 2680       | 2920        | 3160         | 6333                       | 7333        | *            | T212A393K100(2)S |                                                |
| 0.039                                                      | A            | 20                             | T110A393M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.047                                                      | A            | 5                              | T110A473J100AS       | 0.3                                | 2                                                 | 5134                                                      | 5334       | 5534        | 5734         | 6334                       | 7334        | *            | T212A473J100(2)S |                                                |
| 0.047                                                      | A            | 10                             | T110A473K100AS       | 0.3                                | 2                                                 | 2441                                                      | 2681       | 2921        | 3161         | 6335                       | 7335        | *            | T212A473K100(2)S |                                                |
| 0.047                                                      | A            | 20                             | T110A473M100AS       | 0.3                                | 2                                                 | 2442                                                      | 2682       | 2922        | 3162         | 6336                       | 7336        | *            | T212A473M100(2)S |                                                |
| 0.056                                                      | A            | 5                              | T110A563J100AS       | 0.3                                | 2                                                 | 5135                                                      | 5335       | 5535        | 5735         | 6337                       | 7337        | *            | T212A563J100(2)S |                                                |
| 0.056                                                      | A            | 10                             | T110A563K100AS       | 0.3                                | 2                                                 | 2443                                                      | 2683       | 2923        | 3163         | 6338                       | 7338        | *            | T212A563K100(2)S |                                                |
| 0.056                                                      | A            | 20                             | T110A563M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.068                                                      | A            | 5                              | T110A683J100AS       | 0.3                                | 2                                                 | 5136                                                      | 5336       | 5536        | 5736         | 6339                       | 7339        | *            | T212A683J100(2)S |                                                |
| 0.068                                                      | A            | 10                             | T110A683K100AS       | 0.3                                | 2                                                 | 2444                                                      | 2684       | 2924        | 3164         | 6340                       | 7340        | *            | T212A683K100(2)S |                                                |
| 0.068                                                      | A            | 20                             | T110A683M100AS       | 0.3                                | 2                                                 | 2445                                                      | 2685       | 2925        | 3165         | 6341                       | 7341        | *            | T212A683M100(2)S |                                                |
| 0.082                                                      | A            | 5                              | T110A823J100AS       | 0.3                                | 2                                                 | 5137                                                      | 5337       | 5537        | 5737         | 6342                       | 7342        | *            | T212A823J100(2)S |                                                |
| 0.082                                                      | A            | 10                             | T110A823K100AS       | 0.3                                | 2                                                 | 2446                                                      | 2686       | 2926        | 3166         | 6343                       | 7343        | *            | T212A823K100(2)S |                                                |
| 0.082                                                      | A            | 20                             | T110A823M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.1                                                        | A            | 5                              | T110A104J100AS       | 0.3                                | 2                                                 | 5138                                                      | 5338       | 5538        | 5738         | 6344                       | 7344        | *            | T212A104J100(2)S |                                                |
| 0.1                                                        | A            | 10                             | T110A104K100AS       | 0.3                                | 2                                                 | 2447                                                      | 2687       | 2927        | 3167         | 6345                       | 7345        | *            | T212A104K100(2)S |                                                |
| 0.1                                                        | A            | 20                             | T110A104M100AS       | 0.3                                | 2                                                 | 2448                                                      | 2688       | 2928        | 3168         | 6346                       | 7346        | *            | T212A104M100(2)S |                                                |
| 0.12                                                       | A            | 5                              | T110A124J100AS       | 0.3                                | 2                                                 | 5139                                                      | 5339       | 5539        | 5739         | 6347                       | 7347        | *            | T212A124J100(2)S |                                                |
| 0.12                                                       | A            | 10                             | T110A124K100AS       | 0.3                                | 2                                                 | 2449                                                      | 2689       | 2929        | 3169         | 6348                       | 7348        | *            | T212A124K100(2)S |                                                |
| 0.12                                                       | A            | 20                             | T110A124M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.15                                                       | A            | 5                              | T110A154J100AS       | 0.3                                | 2                                                 | 5140                                                      | 5340       | 5540        | 5740         | 6349                       | 7349        | *            | T212A154J100(2)S |                                                |
| 0.15                                                       | A            | 10                             | T110A154K100AS       | 0.3                                | 2                                                 | 2450                                                      | 2690       | 2930        | 3170         | 6350                       | 7350        | *            | T212A154K100(2)S |                                                |
| 0.15                                                       | A            | 20                             | T110A154M100AS       | 0.3                                | 2                                                 | 2451                                                      | 2691       | 2931        | 3171         | 6351                       | 7351        | *            | T212A154M100(2)S |                                                |
| 0.18                                                       | A            | 5                              | T110A184J100AS       | 0.3                                | 2                                                 | 5141                                                      | 5341       | 5541        | 5741         | 6352                       | 7352        | *            | T212A184J100(2)S |                                                |
| 0.18                                                       | A            | 10                             | T110A184K100AS       | 0.3                                | 2                                                 | 2452                                                      | 2692       | 2932        | 3172         | 6353                       | 7353        | *            | T212A184K100(2)S |                                                |
| 0.18                                                       | A            | 20                             | T110A184M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.22                                                       | A            | 5                              | T110A224J100AS       | 0.3                                | 2                                                 | 5142                                                      | 5342       | 5542        | 5742         | 6354                       | 7354        | *            | T212A224J100(2)S |                                                |
| 0.22                                                       | A            | 10                             | T110A224K100AS       | 0.3                                | 2                                                 | 2453                                                      | 2693       | 2933        | 3173         | 6355                       | 7355        | *            | T212A224K100(2)S |                                                |
| 0.22                                                       | A            | 20                             | T110A224M100AS       | 0.3                                | 2                                                 | 2454                                                      | 2694       | 2934        | 3174         | 6356                       | 7356        | *            | T212A224M100(2)S |                                                |
| 0.27                                                       | A            | 5                              | T110A274J100AS       | 0.3                                | 2                                                 | 5143                                                      | 5343       | 5543        | 5743         | 6357                       | 7357        | *            | T212A274J100(2)S |                                                |
| 0.27                                                       | A            | 10                             | T110A274K100AS       | 0.3                                | 2                                                 | 2455                                                      | 2695       | 2935        | 3175         | 6358                       | 7358        | *            | T212A274K100(2)S |                                                |
| 0.27                                                       | A            | 20                             | T110A274M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.33                                                       | A            | 5                              | T110A334J100AS       | 0.3                                | 2                                                 | 5144                                                      | 5344       | 5544        | 5744         | 6359                       | 7359        | *            | T212A334J100(2)S |                                                |
| 0.33                                                       | A            | 10                             | T110A334K100AS       | 0.3                                | 2                                                 | 2456                                                      | 2696       | 2936        | 3176         | 6360                       | 7360        | *            | T212A334K100(2)S |                                                |
| 0.33                                                       | A            | 20                             | T110A334M100AS       | 0.3                                | 2                                                 | 2457                                                      | 2697       | 2937        | 3177         | 6361                       | 7361        | *            | T212A334M100(2)S |                                                |
| 0.39                                                       | A            | 5                              | T110A394J100AS       | 0.3                                | 2                                                 | 5145                                                      | 5345       | 5545        | 5745         | 6362                       | 7362        | *            | T212A394J100(2)S |                                                |
| 0.39                                                       | A            | 10                             | T110A394K100AS       | 0.3                                | 2                                                 | 2458                                                      | 2698       | 2938        | 3178         | 6363                       | 7363        | *            | T212A394K100(2)S |                                                |
| 0.39                                                       | A            | 20                             | T110A394M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.47                                                       | A            | 5                              | T110A474J100AS       | 0.3                                | 2                                                 | 5146                                                      | 5346       | 5546        | 5746         | 6364                       | 7364        | *            | T212A474J100(2)S |                                                |
| 0.47                                                       | A            | 10                             | T110A474K100AS       | 0.3                                | 2                                                 | 2459                                                      | 2699       | 2939        | 3179         | 6365                       | 7365        | *            | T212A474K100(2)S |                                                |
| 0.47                                                       | A            | 20                             | T110A474M100AS       | 0.3                                | 2                                                 | 2460                                                      | 2700       | 2940        | 3180         | 6366                       | 7366        | *            | T212A474M100(2)S |                                                |
| 0.56                                                       | A            | 5                              | T110A564J100AS       | 0.3                                | 2                                                 | 5147                                                      | 5347       | 5547        | 5747         | 6367                       | 7367        | *            | T212A564J100(2)S |                                                |
| 0.56                                                       | A            | 10                             | T110A564K100AS       | 0.3                                | 2                                                 | 2461                                                      | 2701       | 2941        | 3181         | 6368                       | 7368        | *            | T212A564K100(2)S |                                                |
| 0.56                                                       | A            | 20                             | T110A564M100AS       | 0.3                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.68                                                       | B            | 5                              | T110B684J100AS       | 0.3                                | 2                                                 | 5148                                                      | 5348       | 5548        | 5748         | 6369                       | 7369        | *            | T212B684J100(2)S |                                                |
| 0.68                                                       | B            | 10                             | T110B684K100AS       | 0.3                                | 2                                                 | 2462                                                      | 2702       | 2942        | 3182         | 6370                       | 7370        | *            | T212B684K100(2)S |                                                |
| 0.68                                                       | B            | 20                             | T110B684M100AS       | 0.3                                | 2                                                 | 2463                                                      | 2703       | 2943        | 3183         | 6371                       | 7371        | *            | T212B684M100(2)S |                                                |
| 0.82                                                       | B            | 5                              | T110B824J100AS       | 0.4                                | 2                                                 | 5149                                                      | 5349       | 5549        | 5749         | 6372                       | 7372        | *            | T212B824J100(2)S |                                                |
| 0.82                                                       | B            | 10                             | T110B824K100AS       | 0.4                                | 2                                                 | 2464                                                      | 2704       | 2944        | 3184         | 6373                       | 7373        | *            | T212B824K100(2)S |                                                |
| 0.82                                                       | B            | 20                             | T110B824M100AS       | 0.4                                | 2                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.0                                                        | B            | 5                              | T110B105J100AS       | 0.5                                | 2                                                 | 5150                                                      | 5350       | 5550        | 5750         | 6374                       | 7374        | *            | T212B105J100(2)S |                                                |
| 1.0                                                        | B            | 10                             | T110B105K100AS       | 0.5                                | 2                                                 | 2465                                                      | 2705       | 2945        | 3185         | 6375                       | 7375        | *            | T212B105K100(2)S |                                                |
| 1.0                                                        | B            | 20                             | T110B105M100AS       | 0.5                                | 2                                                 | 2466                                                      | 2706       | 2946        | 3186         | 6376                       | 7376        | *            | T212B105M100(2)S |                                                |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

Bold Face lines indicate popular part types and values.

\*Note: D Failure Rate — Not QPL for -8304 thru -8401.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T110 SERIES — POLAR TYPE & T212 (CSR13)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                          | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|------------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                            |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                            |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |                  |                                                |
|                                                            |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 100 VOLT RATING AT 85°C — 67 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                                        | B            | 5                              | T110B125J100AS       | 0.5                                | 3                                                 | 5151                                                      | 5351       | 5551        | 5751         | 6377                       | 7377        | *            | T212B125J100(2)S |                                                |
| 1.2                                                        | B            | 10                             | T110B125K100AS       | 0.5                                | 3                                                 | 2467                                                      | 2707       | 2947        | 3187         | 6378                       | 7378        | *            | T212B125K100(2)S |                                                |
| 1.2                                                        | B            | 20                             | T110B125M100AS       | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                                        | B            | 5                              | T110B155J100AS       | 0.7                                | 3                                                 | 5152                                                      | 5352       | 5552        | 5752         | 6379                       | 7379        | *            | T212B155J100(2)S |                                                |
| 1.5                                                        | B            | 10                             | T110B155K100AS       | 0.7                                | 3                                                 | 2468                                                      | 2708       | 2948        | 3188         | 6380                       | 7380        | *            | T212B155K100(2)S |                                                |
| 1.5                                                        | B            | 20                             | T110B155M100AS       | 0.7                                | 3                                                 | 2469                                                      | 2709       | 2949        | 3189         | 6381                       | 7381        | *            | T212B155M100(2)S |                                                |
| 1.8                                                        | B            | 5                              | T110B185J100AS       | 0.7                                | 3                                                 | 5153                                                      | 5353       | 5553        | 5753         | 6382                       | 7382        | *            | T212B185J100(2)S |                                                |
| 1.8                                                        | B            | 10                             | T110B185K100AS       | 0.7                                | 3                                                 | 2470                                                      | 2710       | 2950        | 3190         | 6383                       | 7383        | *            | T212B185K100(2)S |                                                |
| 1.8                                                        | B            | 20                             | T110B185M100AS       | 0.7                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                                        | B            | 5                              | T110B225J100AS       | 0.9                                | 3                                                 | 5154                                                      | 5354       | 5554        | 5754         | 6384                       | 7384        | *            | T212B225J100(2)S |                                                |
| 2.2                                                        | B            | 10                             | T110B225K100AS       | 0.9                                | 3                                                 | 2471                                                      | 2711       | 2951        | 3191         | 6385                       | 7385        | *            | T212B225K100(2)S |                                                |
| 2.2                                                        | B            | 20                             | T110B225M100AS       | 0.9                                | 3                                                 | 2472                                                      | 2712       | 2952        | 3192         | 6386                       | 7386        | *            | T212B225M100(2)S |                                                |
| 2.7                                                        | B            | 5                              | T110B275J100AS       | 1.1                                | 3                                                 | 5155                                                      | 5355       | 5555        | 5755         | 6387                       | 7387        | *            | T212B275J100(2)S |                                                |
| 2.7                                                        | B            | 10                             | T110B275K100AS       | 1.1                                | 3                                                 | 2473                                                      | 2713       | 2953        | 3193         | 6388                       | 7388        | *            | T212B275K100(2)S |                                                |
| 2.7                                                        | B            | 20                             | T110B275M100AS       | 1.1                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.3                                                        | C            | 5                              | T110C335J100AS       | 1.5                                | 3                                                 | 5156                                                      | 5356       | 5556        | 5756         | 6389                       | *           | *            | T212C335J100(2)S |                                                |
| 3.3                                                        | C            | 10                             | T110C335K100AS       | 1.5                                | 3                                                 | 5157                                                      | 5357       | 5557        | 5757         | 6390                       | *           | *            | T212C335K100(2)S |                                                |
| 3.3                                                        | C            | 20                             | T110C335M100AS       | 1.5                                | 3                                                 | 5158                                                      | 5358       | 5558        | 5758         | 6391                       | *           | *            | T212C335M100(2)S |                                                |
| 3.9                                                        | C            | 5                              | T110C395J100AS       | 1.5                                | 3                                                 | 5159                                                      | 5359       | 5559        | 5759         | 6392                       | *           | *            | T212C395J100(2)S |                                                |
| 3.9                                                        | C            | 10                             | T110C395K100AS       | 1.5                                | 3                                                 | 5160                                                      | 5360       | 5560        | 5760         | 6393                       | *           | *            | T212C395K100(2)S |                                                |
| 4.7                                                        | C            | 5                              | T110C475J100AS       | 2.5                                | 3                                                 | 5161                                                      | 5361       | 5561        | 5761         | 6394                       | *           | *            | T212C475J100(2)S |                                                |
| 4.7                                                        | C            | 10                             | T110C475K100AS       | 2.5                                | 3                                                 | 5162                                                      | 5362       | 5562        | 5762         | 6395                       | *           | *            | T212C475K100(2)S |                                                |
| 4.7                                                        | C            | 20                             | T110C475M100AS       | 2.5                                | 3                                                 | 5163                                                      | 5363       | 5563        | 5763         | 6396                       | *           | *            | T212C475M100(2)S |                                                |
| 5.6                                                        | C            | 5                              | T110C565J100AS       | 2.5                                | 3                                                 | 5164                                                      | 5364       | 5564        | 5764         | 6397                       | *           | *            | T212C565J100(2)S |                                                |
| 5.6                                                        | C            | 10                             | T110C565K100AS       | 2.5                                | 3                                                 | 5165                                                      | 5365       | 5565        | 5765         | 6398                       | *           | *            | T212C565K100(2)S |                                                |
| 6.8                                                        | C            | 5                              | T110C685J100AS       | 2.5                                | 3                                                 | 5166                                                      | 5366       | 5566        | 5766         | 6399                       | *           | *            | T212C685J100(2)S |                                                |
| 6.8                                                        | C            | 10                             | T110C685K100AS       | 2.5                                | 3                                                 | 5167                                                      | 5367       | 5567        | 5767         | 6400                       | *           | *            | T212C685K100(2)S |                                                |
| 6.8                                                        | C            | 20                             | T110C685M100AS       | 2.5                                | 3                                                 | 5168                                                      | 5368       | 5568        | 5768         | 6401                       | *           | *            | T212C685M100(2)S |                                                |
| 8.2                                                        | D            | 5,10,20                        | T110D825(1)100AS     | 5.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                                       | D            | 5,10,20                        | T110D106(1)100AS     | 5.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 125 VOLT RATING AT 85°C — 82 VOLT RATING AT 125°           |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0047                                                     | A            | 5,10,20                        | T110A472(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0056                                                     | A            | 5,10,20                        | T110A562(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0068                                                     | A            | 5,10,20                        | T110A682(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0082                                                     | A            | 5,10,20                        | T110A822(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.01                                                       | A            | 5,10,20                        | T110A103(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.012                                                      | A            | 5,10,20                        | T110A123(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.015                                                      | A            | 5,10,20                        | T110A153(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.018                                                      | A            | 5,10,20                        | T110A183(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.022                                                      | A            | 5,10,20                        | T110A223(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.027                                                      | A            | 5,10,20                        | T110A273(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.033                                                      | A            | 5,10,20                        | T110A333(1)125AS     | 0.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.039                                                      | A            | 5,10,20                        | T110A393(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.047                                                      | A            | 5,10,20                        | T110A473(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.056                                                      | A            | 5,10,20                        | T110A563(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.068                                                      | A            | 5,10,20                        | T110A683(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.082                                                      | A            | 5,10,20                        | T110A823(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.1                                                        | A            | 5,10,20                        | T110A104(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.12                                                       | A            | 5,10,20                        | T110A124(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.15                                                       | A            | 5,10,20                        | T110A154(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.18                                                       | A            | 5,10,20                        | T110A184(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.22                                                       | A            | 5,10,20                        | T110A224(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.27                                                       | A            | 5,10,20                        | T110A274(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.33                                                       | A            | 5,10,20                        | T110A334(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.39                                                       | B            | 5,10,20                        | T110B394(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.47                                                       | B            | 5,10,20                        | T110B474(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.56                                                       | B            | 5,10,20                        | T110B564(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.68                                                       | B            | 5,10,20                        | T110B684(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.82                                                       | B            | 5,10,20                        | T110B824(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

\*Note: C failure rate — Not QPL for 7389 thru 7401.

D failure rate — Not QPL for -8304 thru -8401.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                 | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T110           |                                    |                                                   | MIL-PRF-39003 (CSR13) CAPACITORS                          |            |             |              |                            |             |              |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|---------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|--|------------------------------------------------|
|                                                   |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |  |                                                |
|                                                   |              |                                |                      |                                    |                                                   | MIL-PRF-39003/1H<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/1H<br>GRADED |             |              |  |                                                |
|                                                   |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |  |                                                |
| 125 VOLT RATING AT 85°C — 82 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |  |                                                |
| 1.0                                               | B            | 5,10,20                        | T110B105(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 1.2                                               | B            | 5,10,20                        | T110B125(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 1.5                                               | B            | 5,10,20                        | T110B155(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 1.8                                               | B            | 5,10,20                        | T110B185(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 2.2                                               | B            | 5,10,20                        | T110B225(1)125AS     | 1.5                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 2.7                                               | C            | 5,10,20                        | T110C275(1)125AS     | 2.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 3.3                                               | C            | 5,10,20                        | T110C335(1)125AS     | 2.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 3.9                                               | C            | 5,10,20                        | T110C395(1)125AS     | 2.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 4.7                                               | C            | 5,10,20                        | T110C475(1)125AS     | 3.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 5.6                                               | C            | 5,10,20                        | T110C565(1)125AS     | 3.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 6.8                                               | C            | 5,10,20                        | T110C685(1)125AS     | 3.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 8.2                                               | D            | 5,10,20                        | T110D825(1)125AS     | 6.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |
| 10.0                                              | D            | 5,10,20                        | T110D106(1)125AS     | 6.0                                | 3                                                 |                                                           |            |             |              |                            |             |              |  |                                                |

(1) To complete T110 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

## T110/T140 Herm Seal ESR (OHMS) at 100 kHz @ +25°C

(The ESR values provided below are for reference only. No warranty, as stated on page 3 and reincorporated here, is made as to the accuracy of these values for any particular T110/T140 Series product.)

| Cap<br>μF | 6<br>Volt | 10<br>Volt | 15<br>Volt | 20<br>Volt | 30<br>Volt | 35<br>Volt | 50<br>Volt | 60<br>Volt | 75<br>Volt | 100<br>Volt | 125<br>Volt |
|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|
| 0.10      |           |            |            | 37.0       |            | 26.0       | 26.0       | 26.0       | 26.0       | 25.0        | 25.0        |
| 0.12      |           |            |            | 37.0       |            | 26.0       | 26.0       | 26.0       | 26.0       | 25.0        | 25.0        |
| 0.15      |           |            |            | 32.0       |            | 21.0       | 21.0       | 21.0       | 21.0       | 20.0        | 20.0        |
| 0.18      |           |            |            | 32.0       |            | 21.0       | 21.0       | 21.0       | 21.0       | 20.0        | 20.0        |
| 0.22      |           |            |            | 27.0       |            | 17.0       | 17.0       | 17.0       | 17.0       | 16.0        | 16.0        |
| 0.27      |           |            |            | 25.0       |            | 17.0       | 17.0       | 17.0       | 17.0       | 16.0        | 16.0        |
| 0.33      |           |            | 28.0       | 22.0       |            | 15.0       | 15.0       | 15.0       | 15.0       | 14.0        | 14.0        |
| 0.39      |           |            | 28.0       | 22.0       |            | 15.0       | 15.0       | 15.0       | 15.0       | 14.0        | 14.0        |
| 0.47      |           |            | 26.0       | 20.0       |            | 13.0       | 13.0       | 13.0       | 13.0       | 12.0        | 12.0        |
| 0.56      |           |            | 26.0       | 18.0       |            | 13.0       | 13.0       | 13.0       | 13.0       | 12.0        | 12.0        |
| 0.68      |           |            | 24.0       | 16.0       |            | 10.0       | 10.0       | 10.0       | 10.0       | 9.0         | 9.0         |
| 0.82      |           |            | 24.0       | 16.0       |            | 10.0       | 10.0       | 10.0       | 10.0       | 9.0         | 9.0         |
| 1.0       |           | 20.0       | 17.0       | 10.0       |            | 8.0        | 8.0        | 8.0        | 8.0        | 7.0         | 7.0         |
| 1.2       |           | 20.0       | 17.0       | 10.0       | 9.0        | 8.0        | 8.0        | 8.0        | 8.0        | 7.0         | 7.0         |
| 1.5       |           | 14.0       | 10.0       | 9.0        | 8.0        | 6.0        | 5.0        | 5.0        | 5.0        | 4.0         | 4.0         |
| 1.8       |           | 14.0       | 10.0       | 9.0        | 8.0        | 6.0        | 5.0        | 5.0        | 5.0        | 4.0         | 4.0         |
| 2.2       | 14.0      | 13.0       | 8.0        | 7.0        | 6.0        | 5.0        | 3.5        | 3.5        | 3.5        | 3.0         | 3.0         |
| 2.7       | 14.0      | 13.0       | 8.0        | 7.0        | 6.0        | 5.0        | 3.5        | 3.5        | 3.5        | 3.0         | 3.0         |
| 3.3       | 13.0      | 10.0       | 6.0        | 5.5        |            | 4.0        | 3.0        | 3.0        | 3.0        | 2.5         | 2.5         |
| 3.9       | 13.0      | 10.0       | 6.0        | 5.5        |            | 4.0        | 3.0        | 3.0        | 3.0        | 2.5         | 2.5         |
| 4.7       | 10.0      | 8.0        | 5.0        | 4.5        |            | 3.0        | 2.5        | 2.5        | 2.5        | 2.0         | 2.0         |
| 5.6       | 10.0      | 8.0        | 5.0        | 4.5        |            | 3.0        | 2.5        | 2.5        | 2.5        | 2.0         | 2.0         |
| 6.8       | 8.0       | 6.0        | 4.0        | 3.6        |            | 2.5        | 2.0        | 2.0        | 2.0        | 1.5         | 1.5         |
| 8.2       | 8.0       | 6.0        | 4.0        | 3.6        |            | 2.5        | 2.0        | 2.0        | 2.0        | 1.5         | 1.5         |
| 10.0      | 6.0       | 5.0        | 3.2        | 2.9        |            | 2.0        | 1.6        | 1.6        | 1.6        | 1.0         | 1.0         |
| 12.0      | 6.0       | 5.0        | 3.2        | 2.9        | 2.5        | 2.0        | 1.6        | 1.6        | 1.6        |             |             |
| 15.0      | 5.0       | 3.7        | 2.5        | 2.3        | 2.0        | 1.6        | 1.2        | 1.2        | 1.2        |             |             |
| 18.0      | 5.0       | 3.7        | 2.5        | 2.3        | 2.0        | 1.6        | 1.2        | 1.2        |            |             |             |
| 22.0      | 3.7       | 2.7        | 2.0        | 1.8        |            | 1.3        | 1.0        | 1.0        |            |             |             |
| 27.0      | 3.7       | 2.7        | 2.0        | 1.8        |            | 1.3        | 1.0        | 1.0        |            |             |             |
| 33.0      | 3.0       | 2.1        | 1.6        | 1.4        | 1.2        | 1.0        | 0.8        | 0.8        |            |             |             |
| 39.0      | 3.0       | 2.1        | 1.6        | 1.4        | 1.2        | 1.0        | 0.8        |            |            |             |             |
| 47.0      | 2.0       | 1.7        | 1.3        | 1.2        | 1.0        | 0.8        | 0.6        |            |            |             |             |
| 56.0      | 2.0       | 1.7        | 1.3        | 1.2        | 1.0        | 0.8        |            |            |            |             |             |
| 68.0      | 1.8       | 1.3        | 1.0        | 0.9        | 0.8        | 0.6        |            |            |            |             |             |
| 82.0      | 1.8       | 1.3        | 1.0        | 0.9        | 0.8        | 0.6        |            |            |            |             |             |
| 100.0     | 1.6       | 1.0        | 0.8        | 0.6        | 0.5        |            |            |            |            |             |             |
| 120.0     | 1.6       | 1.0        | 0.8        | 0.6        |            |            |            |            |            |             |             |
| 150.0     | 0.9       | 0.8        | 0.6        | 0.5        |            |            |            |            |            |             |             |
| 180.0     | 0.9       | 0.8        | 0.6        | 0.5        |            |            |            |            |            |             |             |
| 220.0     | 0.9       | 0.6        | 0.5        |            |            |            |            |            |            |             |             |
| 270.0     | 0.9       | 0.6        | 0.5        |            |            |            |            |            |            |             |             |
| 330.0     | 0.7       | 0.5        | 0.4        |            |            |            |            |            |            |             |             |
| 390.0     | 0.7       | 0.5        |            |            |            |            |            |            |            |             |             |
| 470.0     | 0.5       | 0.5        |            |            |            |            |            |            |            |             |             |
| 560.0     | 0.5       | 0.5        |            |            |            |            |            |            |            |             |             |
| 680.0     | 0.3       |            |            |            |            |            |            |            |            |             |             |
| 820.0     | 0.3       |            |            |            |            |            |            |            |            |             |             |
| 1000.0    | 0.12      |            |            |            |            |            |            |            |            |             |             |
| 1200.0    | 0.12      |            |            |            |            |            |            |            |            |             |             |

## T110 Herm Seal LOW ESR (OHMS) at 100 kHz @ +25°C

The ESR values provided below may be ordered using KEMET Customer Specification 2864.

| Cap<br>μF | 6<br>Volt | 10<br>Volt | 15<br>Volt | 20<br>Volt | 35<br>Volt | 50<br>Volt |
|-----------|-----------|------------|------------|------------|------------|------------|
| 5.6       |           |            |            |            |            | 0.300      |
| 6.8       |           |            |            |            |            | 0.275      |
| 8.2       |           |            |            |            | 0.250      | 0.250      |
| 10.0      |           |            |            |            | 0.230      | 0.230      |
| 12.0      |           |            |            |            | 0.210      | 0.210      |
| 15.0      |           |            |            |            | 0.190      | 0.190      |
| 18.0      |           |            |            |            | 0.175      | 0.175      |
| 22.0      |           |            |            |            | 0.160      | 0.160      |
| 27.0      |           |            |            | 0.145      | 0.145      |            |
| 33.0      |           |            |            | 0.130      | 0.130      |            |
| 39.0      |           |            |            | 0.120      | 0.120      |            |
| 47.0      |           |            |            | 0.110      | 0.110      |            |
| 56.0      |           |            | 0.100      | 0.100      |            |            |
| 68.0      |           |            | 0.095      | 0.095      |            |            |
| 82.0      |           | 0.085      | 0.085      | 0.085      |            |            |
| 100.0     |           | 0.075      | 0.075      | 0.075      |            |            |
| 120.0     |           | 0.070      | 0.070      |            |            |            |
| 150.0     | 0.065     | 0.065      |            |            |            |            |
| 180.0     | 0.060     | 0.060      |            |            |            |            |
| 220.0     | 0.055     | 0.055      |            |            |            |            |
| 270.0     | 0.050     |            |            |            |            |            |
| 330.0     | 0.045     |            |            |            |            |            |

Primarily designed for use in tuned low frequency circuits, phasing low voltage AC motors, servo systems and other applications where reversal of polarity is a primary consideration. The T111 unit consists of two polar T110 Series hermetically sealed tantalum capacitors, electrically and mechanically connected back-to-back and supported by an outer

corrosion-resistant metal sleeve. They exhibit comparable electrical and performance characteristics of T110 Series. Available in capacitance values ranging from .0023 to 160  $\mu\text{F}$  in  $\pm 20\%$ ,  $\pm 10\%$ , and  $\pm 5\%$  tolerances in working voltages from 6 to 100 VDC at  $+85^\circ\text{C}$ . Also, the following table includes M39003/4 QPL Product.

### DIMENSIONS — INCHES & (MILLIMETERS)

### MARKING INFORMATION\* A, B, C & D CASES

| CASE SIZE | B<br>$\pm 0.002$ ( $\pm .05$ ) | UNINSULATED                    |                                | INSULATED                                             |                                | C<br>MAX.     |
|-----------|--------------------------------|--------------------------------|--------------------------------|-------------------------------------------------------|--------------------------------|---------------|
|           |                                | D<br>$\pm 0.010$ ( $\pm .25$ ) | L<br>$\pm 0.031$ ( $\pm .79$ ) | D<br>$\pm 0.010$ ( $\pm .25$ )<br>$-0.015$ ( $-.38$ ) | L<br>$\pm 0.031$ ( $\pm .79$ ) |               |
| A         | 0.020 (.51)                    | 0.147 (3.73)                   | 0.565 (14.35)                  | 0.161 (4.09)                                          | 0.575 (14.61)                  | 0.750 (19.05) |
| B         | 0.020 (.51)                    | 0.194 (4.93)                   | 0.916 (23.27)                  | 0.207 (5.26)                                          | 0.955 (24.26)                  | 1.130 (28.70) |
| C         | 0.025 (.64)                    | 0.300 (7.62)                   | 1.340 (34.04)                  | 0.314 (7.98)                                          | 1.350 (34.29)                  | 1.525 (38.74) |
| D         | 0.025 (.64)                    | 0.362 (9.19)                   | 1.540 (39.12)                  | 0.376 (9.55)                                          | 1.550 (39.37)                  | 1.725 (43.82) |

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| K 10%             | — Manufacturer's Classification and Tolerance                    |
| 6R0 $\mu\text{F}$ | — Normal Capacitance — ( $\mu\text{F}$ ) (*R* indicates decimal) |
| 20V               | — Voltage                                                        |
| 0325AB            | — Date Code and Batch Code                                       |

### CAPACITOR OUTLINE DRAWINGS



\* For Military Marking, see page 4.

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                               | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T111 SERIES    |                                    |                                                        | MIL-PRF-39003 (CSR91) CAPACITORS                          |            |             |              |                                                |             |              |                  |
|-------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|------------------------------------------------|-------------|--------------|------------------|
|                                                 |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |             |              |                  |
|                                                 |              |                                |                      |                                    |                                                        | MIL-PRF-39003/4C<br>EXPONENTIAL                           |            |             |              |                                                |             |              |                  |
|                                                 |              |                                |                      |                                    |                                                        | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(1.0)                                     | C<br>(0.01) | D<br>(0.001) |                  |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C  |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                                                |             |              |                  |
| 2.8                                             | A            | 10                             | T111A285K006AS       | 0.3                                | 4                                                      | 0221                                                      | 0441       | 0661        | 0881         | 3001                                           | 4001        | 5001         | T213A285K006(1)S |
| 3.4                                             | A            | 10                             | T111A345K006AS       | 0.3                                | 6                                                      | 0222                                                      | 0442       | 0662        | 0882         | 3002                                           | 4002        | 5002         | T213A345K006(1)S |
| 3.4                                             | A            | 20                             | T111A345M006AS       | 0.3                                | 6                                                      | 0223                                                      | 0443       | 0663        | 0883         | 3003                                           | 4003        | 5003         | T213A345M006(1)S |
| 23.0                                            | B            | 10                             | T111B236K006AS       | 1.5                                | 6                                                      | 0224                                                      | 0444       | 0664        | 0884         | 3004                                           | 4004        | 5004         | T213B236K006(1)S |
| 23.0                                            | B            | 20                             | T111B236M006AS       | 1.5                                | 6                                                      | 0225                                                      | 0445       | 0665        | 0885         | 3005                                           | 4005        | 5005         | T213B236M006(1)S |
| 28.0                                            | B            | 10                             | T111B286K006AS       | 1.5                                | 6                                                      | 0226                                                      | 0446       | 0666        | 0886         | 3006                                           | 4006        | 5006         | T213B286K006(1)S |
| 75.0                                            | C            | 10                             | T111C756K006AS       | 4.5                                | 6                                                      | 0227                                                      | 0447       | 0667        | 0887         | 3007                                           | 4007        | 5007         | T213C756K006(1)S |
| 75.0                                            | C            | 20                             | T111C756M006AS       | 4.5                                | 6                                                      | 0228                                                      | 0448       | 0668        | 0888         | 3008                                           | 4008        | 5008         | T213C756M006(1)S |
| 90.0                                            | C            | 10                             | T111C906K006AS       | 4.5                                | 6                                                      | 0229                                                      | 0449       | 0669        | 0889         | 3009                                           | 4009        | 5009         | T213C906K006(1)S |
| 90.0                                            | C            | 20                             | T111C906M006AS       | 5.5                                | 6                                                      | 0230                                                      | 0450       | 0670        | 0890         |                                                |             |              | T213C906M006(1)S |
| 130.0                                           | D            | 10                             | T111D137K006AS       | 6.0                                | 8                                                      | 0231                                                      | 0451       | 0671        | 0891         | 3010                                           | 4010        | 5010         | T213D137K006(1)S |
| 130.0                                           | D            | 20                             | T111D137M006AS       | 6.0                                | 8                                                      | 0232                                                      | 0452       | 0672        | 0892         |                                                |             |              | T213D137M006(1)S |
| 160.0                                           | D            | 10                             | T111D167K006AS       | 7.5                                | 8                                                      | 0233                                                      | 0453       | 0673        | 0893         | 3011                                           | 4011        | 5011         | T213D167K006(1)S |
| 160.0                                           | D            | 20                             | T111D167M006AS       | 7.5                                | 8                                                      | 0234                                                      | 0454       | 0674        | 0894         | 3012                                           | 4012        | 5012         | T213D167M006(1)S |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                                                |             |              |                  |
| 1.9                                             | A            | 10                             | T111A195K010AS       | 0.3                                | 4                                                      | 0235                                                      | 0455       | 0675        | 0895         | 3013                                           | 4013        | 5013         | T213A195K010(1)S |
| 2.3                                             | A            | 10                             | T111A235K010AS       | 0.4                                | 4                                                      | 0236                                                      | 0456       | 0676        | 0896         | 3014                                           | 4014        | 5014         | T213A235K010(1)S |
| 2.3                                             | A            | 20                             | T111A235M010AS       | 0.4                                | 4                                                      | 0237                                                      | 0457       | 0677        | 0897         | 3015                                           | 4015        | 5015         | T213A235M010(1)S |
| 13.0                                            | B            | 10                             | T111B136K010AS       | 2.0                                | 6                                                      | 0238                                                      | 0458       | 0678        | 0898         | 3016                                           | 4016        | 5016         | T213B136K010(1)S |
| 16.0                                            | B            | 10                             | T111B166K010AS       | 2.0                                | 6                                                      | 0239                                                      | 0459       | 0679        | 0899         | 3017                                           | 4017        | 5017         | T213B166K010(1)S |
| 16.0                                            | B            | 20                             | T111B166M010AS       | 2.0                                | 6                                                      | 0240                                                      | 0460       | 0680        | 0900         | 3018                                           | 4018        | 5018         | T213B166M010(1)S |
| 19.0                                            | B            | 10                             | T111B196K010AS       | 2.0                                | 6                                                      | 0241                                                      | 0461       | 0681        | 0901         | 3019                                           | 4019        | 5019         | T213B196K010(1)S |
| 41.0                                            | C            | 10                             | T111C416K010AS       | 3.0                                | 6                                                      | 0242                                                      | 0462       | 0682        | 0902         | 3020                                           | 4020        | 5020         | T213C416K010(1)S |
| 50.0                                            | C            | 10                             | T111C506K010AS       | 5.0                                | 6                                                      | 0243                                                      | 0463       | 0683        | 0903         | 3021                                           | 4021        | 5021         | T213C506K010(1)S |
| 50.0                                            | C            | 20                             | T111C506M010AS       | 5.0                                | 6                                                      | 0244                                                      | 0464       | 0684        | 0904         | 3022                                           | 4022        | 5022         | T213C506M010(1)S |
| 60.0                                            | C            | 10                             | T111C606K010AS       | 6.0                                | 6                                                      | 0245                                                      | 0465       | 0685        | 0905         | 3023                                           | 4023        | 5023         | T213C606K010(1)S |
| 60.0                                            | C            | 20                             | T111C606M010AS       | 6.0                                | 6                                                      | 0246                                                      | 0466       | 0686        | 0906         |                                                |             |              | T213C606M010(1)S |
| 90.0                                            | D            | 10                             | T111D906K010AS       | 9.0                                | 6                                                      | 0247                                                      | 0467       | 0687        | 0907         | 3024                                           | 4024        | 5024         | T213D906K010(1)S |
| 110.0                                           | D            | 10                             | T111D117K010AS       | 10.0                               | 8                                                      | 0248                                                      | 0468       | 0688        | 0908         | 3025                                           | 4025        | 5025         | T213D117K010(1)S |
| 110.0                                           | D            | 20                             | T111D117M010AS       | 10.0                               | 8                                                      | 0249                                                      | 0469       | 0689        | 0909         | 3026                                           | 4026        | 5026         | T213D117M010(1)S |

(1) To complete T213 Series Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 6.

\*For ordering information see page 4 (military) and page 6.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T111 SERIES    |                                    |                                                        | MIL-PRF-39003 (CSR91) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|--------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                  |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                  |              |                                |                      |                                    |                                                        | MIL-PRF-39003/4C<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/4C<br>GRADED |             |              |                  |                                                |
|                                                  |              |                                |                      |                                    |                                                        | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.3                                              | A            | 10                             | T111A135K015AS       | 0.3                                | 4                                                      | 0250                                                      | 0470       | 0690        | 0910         | 3027                       | 4027        | 5027         | T213A135K015(1)S |                                                |
| 1.6                                              | A            | 10                             | T111A165K015AS       | 0.4                                | 4                                                      | 0251                                                      | 0471       | 0691        | 0911         | 3028                       | 4028        | 5028         | T213A165K015(1)S |                                                |
| 1.6                                              | A            | 20                             | T111A165M015AS       | 0.4                                | 4                                                      | 0252                                                      | 0472       | 0692        | 0912         | 3029                       | 4029        | 5029         | T213A165M015(1)S |                                                |
| 9.0                                              | B            | 10                             | T111B905K015AS       | 2.0                                | 6                                                      | 0253                                                      | 0473       | 0693        | 0913         | 3030                       | 4030        | 5030         | T213B905K015(1)S |                                                |
| 11.0                                             | B            | 10                             | T111B116K015AS       | 2.0                                | 6                                                      | 0254                                                      | 0474       | 0694        | 0914         | 3031                       | 4031        | 5031         | T213B116K015(1)S |                                                |
| 11.0                                             | B            | 20                             | T111B116M015AS       | 2.0                                | 6                                                      | 0255                                                      | 0475       | 0695        | 0915         | 3032                       | 4032        | 5032         | T213B116M015(1)S |                                                |
| 28.0                                             | C            | 10                             | T111C286K015AS       | 4.0                                | 6                                                      | 0256                                                      | 0476       | 0696        | 0916         | 3033                       | 4033        | 5033         | T213C286K015(1)S |                                                |
| 34.0                                             | C            | 10                             | T111C346K015AS       | 5.0                                | 6                                                      | 0257                                                      | 0477       | 0697        | 0917         | 3034                       | 4034        | 5034         | T213C346K015(1)S |                                                |
| 34.0                                             | C            | 20                             | T111C346M015AS       | 5.0                                | 6                                                      | 0258                                                      | 0478       | 0698        | 0918         | 3035                       | 4035        | 5035         | T213C346M015(1)S |                                                |
| 60.0                                             | D            | 10                             | T111D606K015AS       | 6.0                                | 6                                                      | 0259                                                      | 0479       | 0699        | 0919         | 3036                       | 4036        | 5036         | T213D606K015(1)S |                                                |
| 75.0                                             | D            | 10                             | T111D756K015AS       | 10.0                               | 6                                                      | 0260                                                      | 0480       | 0700        | 0920         | 3037                       | 4037        | 5037         | T213D756K015(1)S |                                                |
| 75.0                                             | D            | 20                             | T111D756M015AS       | 10.0                               | 6                                                      | 0261                                                      | 0481       | 0701        | 0921         | 3038                       | 4038        | 5038         | T213D756M015(1)S |                                                |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.6                                              | A            | 10                             | T111A604K020AS       | 0.3                                | 4                                                      | 0262                                                      | 0482       | 0702        | 0922         | 3039                       | 4039        | 5039         | T213A604K020(1)S |                                                |
| 0.75                                             | A            | 10                             | T111A754K020AS       | 0.3                                | 4                                                      | 0263                                                      | 0483       | 0703        | 0923         | 3040                       | 4040        | 5040         | T213A754K020(1)S |                                                |
| 0.75                                             | A            | 20                             | T111A754M020AS       | 0.3                                | 4                                                      | 0264                                                      | 0484       | 0704        | 0924         | 3041                       | 4041        | 5041         | T213A754M020(1)S |                                                |
| 0.9                                              | A            | 10                             | T111A904K020AS       | 0.3                                | 4                                                      | 0265                                                      | 0485       | 0705        | 0925         | 3042                       | 4042        | 5042         | T213A904K020(1)S |                                                |
| 1.1                                              | A            | 10                             | T111A115K020AS       | 0.4                                | 4                                                      | 0266                                                      | 0486       | 0706        | 0926         | 3043                       | 4043        | 5043         | T213A115K020(1)S |                                                |
| 1.1                                              | A            | 20                             | T111A115M020AS       | 0.4                                | 4                                                      | 0267                                                      | 0487       | 0707        | 0927         | 3044                       | 4044        | 5044         | T213A115M020(1)S |                                                |
| 4.1                                              | B            | 10                             | T111B415K020AS       | 1.0                                | 6                                                      | 0268                                                      | 0488       | 0708        | 0928         | 3045                       | 4045        | 5045         | T213B415K020(1)S |                                                |
| 5.0                                              | B            | 10                             | T111B505K020AS       | 1.0                                | 6                                                      | 0269                                                      | 0489       | 0709        | 0929         | 3046                       | 4046        | 5046         | T213B505K020(1)S |                                                |
| 5.0                                              | B            | 20                             | T111B505M020AS       | 1.0                                | 6                                                      | 0270                                                      | 0490       | 0710        | 0930         | 3047                       | 4047        | 5047         | T213B505M020(1)S |                                                |
| 6.0                                              | B            | 10                             | T111B605K020AS       | 1.0                                | 6                                                      | 0271                                                      | 0491       | 0711        | 0931         | 3048                       | 4048        | 5048         | T213B605K020(1)S |                                                |
| 7.5                                              | B            | 10                             | T111B755K020AS       | 2.0                                | 6                                                      | 0272                                                      | 0492       | 0712        | 0932         | 3049                       | 4049        | 5049         | T213B755K020(1)S |                                                |
| 7.5                                              | B            | 20                             | T111B755M020AS       | 2.0                                | 6                                                      | 0273                                                      | 0493       | 0713        | 0933         | 3050                       | 4050        | 5050         | T213B755M020(1)S |                                                |
| 13.0                                             | C            | 10                             | T111C136K020AS       | 2.5                                | 6                                                      | 0274                                                      | 0494       | 0714        | 0934         | 3051                       | 4051        | 5051         | T213C136K020(1)S |                                                |
| 16.0                                             | C            | 10                             | T111C166K020AS       | 3.0                                | 6                                                      | 0275                                                      | 0495       | 0715        | 0935         | 3052                       | 4052        | 5052         | T213C166K020(1)S |                                                |
| 16.0                                             | C            | 20                             | T111C166M020AS       | 3.0                                | 6                                                      | 0276                                                      | 0496       | 0716        | 0936         | 3053                       | 4053        | 5053         | T213C166M020(1)S |                                                |
| 19.0                                             | C            | 10                             | T111C196K020AS       | 3.0                                | 6                                                      | 0277                                                      | 0497       | 0717        | 0937         | 3054                       | 4054        | 5054         | T213C196K020(1)S |                                                |
| 23.0                                             | C            | 10                             | T111C236K020AS       | 4.5                                | 6                                                      | 0278                                                      | 0498       | 0718        | 0938         | 3055                       | 4055        | 5055         | T213C236K020(1)S |                                                |
| 23.0                                             | C            | 20                             | T111C236M020AS       | 4.5                                | 6                                                      | 0279                                                      | 0499       | 0719        | 0939         | 3056                       | 4056        | 5056         | T213C236M020(1)S |                                                |
| 28.0                                             | D            | 10                             | T111D286K020AS       | 5.5                                | 6                                                      | 0280                                                      | 0500       | 0720        | 0940         | 3057                       | 4057        | 5057         | T213D286K020(1)S |                                                |
| 34.0                                             | D            | 10                             | T111D346K020AS       | 6.0                                | 6                                                      | 0281                                                      | 0501       | 0721        | 0941         | 3058                       | 4058        | 5058         | T213D346K020(1)S |                                                |
| 34.0                                             | D            | 20                             | T111D346M020AS       | 6.0                                | 6                                                      | 0282                                                      | 0502       | 0722        | 0942         | 3059                       | 4059        | 5059         | T213D346M020(1)S |                                                |
| 41.0                                             | D            | 10                             | T111D416K020AS       | 6.0                                | 6                                                      | 0283                                                      | 0503       | 0723        | 0943         | 3060                       | 4060        | 5060         | T213D416K020(1)S |                                                |
| 50.0                                             | D            | 10                             | T111D506K020AS       | 10.0                               | 6                                                      | 0284                                                      | 0504       | 0724        | 0944         | 3061                       | 4061        | 5061         | T213D506K020(1)S |                                                |
| 50.0                                             | D            | 20                             | T111D506M020AS       | 10.0                               | 6                                                      | 0285                                                      | 0505       | 0725        | 0945         | 3062                       | 4062        | 5062         | T213D506M020(1)S |                                                |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.8                                              | B            | 10                             | T111B285K035AS       | 1.0                                | 4                                                      | 0289                                                      | 0509       | 0729        | 0949         | 3063                       | 4063        | 5063         | T213B285K035(1)S |                                                |
| 3.4                                              | B            | 10                             | T111B345K035AS       | 1.5                                | 4                                                      | 0290                                                      | 0510       | 0730        | 0950         | 3064                       | 4064        | 5064         | T213B345K035(1)S |                                                |
| 3.4                                              | B            | 20                             | T111B345M035AS       | 1.5                                | 4                                                      | 0291                                                      | 0511       | 0731        | 0951         | 3065                       | 4065        | 5065         | T213B345M035(1)S |                                                |
| 11.0                                             | C            | 10                             | T111C116K035AS       | 4.0                                | 4                                                      | 0292                                                      | 0512       | 0732        | 0952         | 3066                       | 4066        | 5066         | T213C116K035(1)S |                                                |
| 11.0                                             | C            | 20                             | T111C116M035AS       | 4.0                                | 4                                                      | 0293                                                      | 0513       | 0733        | 0953         | 3067                       | 4067        | 5067         | T213C116M035(1)S |                                                |
| 13.0                                             | D            | 10                             | T111D136K035AS       | 4.5                                | 4                                                      | 0294                                                      | 0514       | 0734        | 0954         | 3068                       | 4068        | 5068         | T213D136K035(1)S |                                                |
| 16.0                                             | D            | 10                             | T111D166K035AS       | 5.5                                | 4                                                      | 0295                                                      | 0515       | 0735        | 0955         | 3069                       | 4069        | 5069         | T213D166K035(1)S |                                                |
| 16.0                                             | D            | 20                             | T111D166M035AS       | 5.5                                | 4                                                      | 0296                                                      | 0516       | 0736        | 0956         | 3070                       | 4070        | 5070         | T213D166M035(1)S |                                                |
| 19.0                                             | D            | 10                             | T111D196K035AS       | 6.0                                | 4                                                      | 0297                                                      | 0517       | 0737        | 0957         | 3071                       | 4071        | 5071         | T213D196K035(1)S |                                                |
| 23.0                                             | D            | 10                             | T111D236K035AS       | 8.0                                | 4                                                      | 0298                                                      | 0518       | 0738        | 0958         | 3072                       | 4072        | 5072         | T213D236K035(1)S |                                                |
| 23.0                                             | D            | 20                             | T111D236M035AS       | 8.0                                | 4                                                      | 0299                                                      | 0519       | 0739        | 0959         | 3073                       | 4073        | 5073         | T213D236M035(1)S |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.0023                                           | A            | 10                             | T111A232K050AS       | 0.1                                | 2                                                      | 1171                                                      | 1241       | 1311        | 1381         | 3074                       | 4074        | 5074         | T213A232K050(1)S |                                                |
| 0.0023                                           | A            | 20                             | T111A232M050AS       | 0.1                                | 2                                                      | 1172                                                      | 1242       | 1312        | 1382         | 3075                       | 4075        | 5075         | T213A232M050(1)S |                                                |
| 0.0028                                           | A            | 10                             | T111A282K050AS       | 0.1                                | 2                                                      | 1173                                                      | 1243       | 1313        | 1383         | 3076                       | 4076        | 5076         | T213A282K050(1)S |                                                |
| 0.0034                                           | A            | 10                             | T111A342K050AS       | 0.1                                | 2                                                      | 1174                                                      | 1244       | 1314        | 1384         | 3077                       | 4077        | 5077         | T213A342K050(1)S |                                                |
| 0.0034                                           | A            | 20                             | T111A342M050AS       | 0.1                                | 2                                                      | 1175                                                      | 1245       | 1315        | 1385         | 3078                       | 4078        | 5078         | T213A342M050(1)S |                                                |
| 0.0041                                           | A            | 10                             | T111A412K050AS       | 0.1                                | 2                                                      | 1176                                                      | 1246       | 1316        | 1386         | 3079                       | 4079        | 5079         | T213A412K050(1)S |                                                |
| 0.005                                            | A            | 10                             | T111A502K050AS       | 0.1                                | 2                                                      | 1177                                                      | 1247       | 1317        | 1387         | 3080                       | 4080        | 5080         | T213A502K050(1)S |                                                |
| 0.005                                            | A            | 20                             | T111A502M050AS       | 0.1                                | 2                                                      | 1178                                                      | 1248       | 1318        | 1388         | 3081                       | 4081        | 5081         | T213A502M050(1)S |                                                |
| 0.006                                            | A            | 10                             | T111A602K050AS       | 0.1                                | 2                                                      | 1179                                                      | 1249       | 1319        | 1389         | 3082                       | 4082        | 5082         | T213A602K050(1)S |                                                |
| 0.0075                                           | A            | 10                             | T111A752K050AS       | 0.1                                | 2                                                      | 1180                                                      | 1250       | 1320        | 1390         | 3083                       | 4083        | 5083         | T213A752K050(1)S |                                                |
| 0.0075                                           | A            | 20                             | T111A752M050AS       | 0.1                                | 2                                                      | 1181                                                      | 1251       | 1321        | 1391         | 3084                       | 4084        | 5084         | T213A752M050(1)S |                                                |
| 0.009                                            | A            | 10                             | T111A902K050AS       | 0.1                                | 2                                                      | 1182                                                      | 1252       | 1322        | 1392         | 3085                       | 4085        | 5085         | T213A902K050(1)S |                                                |
| 0.011                                            | A            | 10                             | T111A113K050AS       | 0.1                                | 2                                                      | 1183                                                      | 1253       | 1323        | 1393         | 3086                       | 4086        | 5086         | T213A113K050(1)S |                                                |
| 0.011                                            | A            | 20                             | T111A113M050AS       | 0.1                                | 2                                                      | 1184                                                      | 1254       | 1324        | 1394         | 3087                       | 4087        | 5087         | T213A113M050(1)S |                                                |
| 0.013                                            | A            | 10                             | T111A133K050AS       | 0.1                                | 2                                                      | 1185                                                      | 1255       | 1325        | 1395         | 3088                       | 4088        | 5088         | T213A133K050(1)S |                                                |
| 0.016                                            | A            | 10                             | T111A163K050AS       | 0.1                                | 2                                                      | 1186                                                      | 1256       | 1326        | 1396         | 3089                       | 4089        | 5089         | T213A163K050(1)S |                                                |

(1) To complete T213 Series Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 6.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

T111 SERIES — NON-POLAR & T213 (CSR91)

## RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T111 SERIES    |                                    |                                                        | MIL-PRF-39003 (CSR91) CAPACITORS                          |            |             |              |                            |             |              |                                                |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIP-<br>ATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|                                                           |              |                                |                      |                                    |                                                        | MIL-PRF-39003/4C<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/4C<br>GRADED |             |              |                                                |
|                                                           |              |                                |                      |                                    |                                                        | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                                                |
| 0.016                                                     | A            | 20                             | T111A163M050AS       | 0.1                                | 2                                                      | 1187                                                      | 1257       | 1327        | 1397         | 3090                       | 4090        | 5090         | T213A163M050(1)S                               |
| 0.019                                                     | A            | 10                             | T111A193K050AS       | 0.1                                | 2                                                      | 1188                                                      | 1258       | 1328        | 1398         | 3091                       | 4091        | 5091         | T213A193K050(1)S                               |
| 0.023                                                     | A            | 10                             | T111A233K050AS       | 0.1                                | 2                                                      | 1189                                                      | 1259       | 1329        | 1399         | 3092                       | 4092        | 5092         | T213A233K050(1)S                               |
| 0.023                                                     | A            | 20                             | T111A233M050AS       | 0.1                                | 2                                                      | 1190                                                      | 1260       | 1330        | 1400         | 3093                       | 4093        | 5093         | T213A233M050(1)S                               |
| 0.028                                                     | A            | 10                             | T111A283K050AS       | 0.1                                | 2                                                      | 1191                                                      | 1261       | 1331        | 1401         | 3094                       | 4094        | 5094         | T213A283K050(1)S                               |
| 0.034                                                     | A            | 10                             | T111A343K050AS       | 0.1                                | 2                                                      | 1192                                                      | 1262       | 1332        | 1402         | 3095                       | 4095        | 5095         | T213A343K050(1)S                               |
| 0.034                                                     | A            | 20                             | T111A343M050AS       | 0.1                                | 2                                                      | 1193                                                      | 1263       | 1333        | 1403         | 3096                       | 4096        | 5096         | T213A343M050(1)S                               |
| 0.041                                                     | A            | 10                             | T111A413K050AS       | 0.1                                | 2                                                      | 1194                                                      | 1264       | 1334        | 1404         | 3097                       | 4097        | 5097         | T213A413K050(1)S                               |
| 0.05                                                      | A            | 10                             | T111A503K050AS       | 0.3                                | 2                                                      | 1195                                                      | 1265       | 1335        | 1405         | 3098                       | 4098        | 5098         | T213A503K050(1)S                               |
| 0.05                                                      | A            | 20                             | T111A503M050AS       | 0.3                                | 2                                                      | 1196                                                      | 1266       | 1336        | 1406         | 3099                       | 4099        | 5099         | T213A503M050(1)S                               |
| 0.06                                                      | A            | 10                             | T111A603K050AS       | 0.3                                | 2                                                      | 1197                                                      | 1267       | 1337        | 1407         | 3100                       | 4100        | 5100         | T213A603K050(1)S                               |
| 0.075                                                     | A            | 10                             | T111A753K050AS       | 0.3                                | 2                                                      | 1198                                                      | 1268       | 1338        | 1408         | 3101                       | 4101        | 5101         | T213A753K050(1)S                               |
| 0.075                                                     | A            | 20                             | T111A753M050AS       | 0.3                                | 2                                                      | 1199                                                      | 1269       | 1339        | 1409         | 3102                       | 4102        | 5102         | T213A753M050(1)S                               |
| 0.09                                                      | A            | 10                             | T111A903K050AS       | 0.3                                | 2                                                      | 1200                                                      | 1270       | 1340        | 1410         | 3103                       | 4103        | 5103         | T213A903K050(1)S                               |
| 0.11                                                      | A            | 10                             | T111A114K050AS       | 0.3                                | 2                                                      | 1201                                                      | 1271       | 1341        | 1411         | 3104                       | 4104        | 5104         | T213A114K050(1)S                               |
| 0.11                                                      | A            | 20                             | T111A114M050AS       | 0.3                                | 2                                                      | 1202                                                      | 1272       | 1342        | 1412         | 3105                       | 4105        | 5105         | T213A114M050(1)S                               |
| 0.13                                                      | A            | 10                             | T111A134K050AS       | 0.3                                | 2                                                      | 1203                                                      | 1273       | 1343        | 1413         | 3106                       | 4106        | 5106         | T213A134K050(1)S                               |
| 0.16                                                      | A            | 10                             | T111A164K050AS       | 0.3                                | 2                                                      | 1204                                                      | 1274       | 1344        | 1414         | 3107                       | 4107        | 5107         | T213A164K050(1)S                               |
| 0.16                                                      | A            | 20                             | T111A164M050AS       | 0.3                                | 2                                                      | 1205                                                      | 1275       | 1345        | 1415         | 3108                       | 4108        | 5108         | T213A164M050(1)S                               |
| 0.19                                                      | A            | 10                             | T111A194K050AS       | 0.3                                | 2                                                      | 1206                                                      | 1276       | 1346        | 1416         | 3109                       | 4109        | 5109         | T213A194K050(1)S                               |
| 0.23                                                      | A            | 10                             | T111A234K050AS       | 0.3                                | 2                                                      | 1207                                                      | 1277       | 1347        | 1417         | 3110                       | 4110        | 5110         | T213A234K050(1)S                               |
| 0.23                                                      | A            | 20                             | T111A234M050AS       | 0.3                                | 2                                                      | 1208                                                      | 1278       | 1348        | 1418         | 3111                       | 4111        | 5111         | T213A234M050(1)S                               |
| 0.28                                                      | A            | 10                             | T111A284K050AS       | 0.3                                | 2                                                      | 1209                                                      | 1279       | 1349        | 1419         | 3112                       | 4112        | 5112         | T213A284K050(1)S                               |
| 0.34                                                      | A            | 10                             | T111A344K050AS       | 0.3                                | 2                                                      | 1210                                                      | 1280       | 1350        | 1420         | 3113                       | 4113        | 5113         | T213A344K050(1)S                               |
| 0.34                                                      | A            | 20                             | T111A344M050AS       | 0.3                                | 2                                                      | 1211                                                      | 1281       | 1351        | 1421         | 3114                       | 4114        | 5114         | T213A344M050(1)S                               |
| 0.41                                                      | A            | 10                             | T111A414K050AS       | 0.3                                | 2                                                      | 0300                                                      | 0520       | 0740        | 0960         | 3115                       | 4115        | 5115         | T213A414K050(1)S                               |
| 0.5                                                       | A            | 10                             | T111A504K050AS       | 0.4                                | 2                                                      | 0301                                                      | 0521       | 0741        | 0961         | 3116                       | 4116        | 5116         | T213A504K050(1)S                               |
| 0.5                                                       | A            | 20                             | T111A504M050AS       | 0.4                                | 2                                                      | 0302                                                      | 0522       | 0742        | 0962         | 3117                       | 4117        | 5117         | T213A504M050(1)S                               |
| 0.6                                                       | B            | 10                             | T111B604K050AS       | 0.4                                | 4                                                      | 1212                                                      | 1282       | 1352        | 1422         | 3118                       | 4118        | 5118         | T213B604K050(1)S                               |
| 0.6                                                       | B            | 20                             | T111B604M050AS       | 0.4                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 0.75                                                      | B            | 10                             | T111B754K050AS       | 0.5                                | 4                                                      | 2001                                                      | 2101       | 2201        | 2301         | 3119                       | 4119        | 5119         | T213B754K050(1)S                               |
| 0.75                                                      | B            | 20                             | T111B754M050AS       | 0.5                                | 4                                                      | 2002                                                      | 2102       | 2202        | 2302         | 3120                       | 4120        | 5120         | T213B754M050(1)S                               |
| 0.9                                                       | B            | 10                             | T111B904K050AS       | 0.5                                | 4                                                      | 1215                                                      | 1285       | 1355        | 1425         | 3121                       | 4121        | 5121         | T213B904K050(1)S                               |
| 0.9                                                       | B            | 20                             | T111B904M050AS       | 0.5                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 1.1                                                       | B            | 10                             | T111B115K050AS       | 0.8                                | 4                                                      | 1216                                                      | 1286       | 1356        | 1426         | 3122                       | 4122        | 5122         | T213B115K050(1)S                               |
| 1.1                                                       | B            | 20                             | T111B115M050AS       | 0.8                                | 4                                                      | 1217                                                      | 1287       | 1357        | 1427         | 3123                       | 4123        | 5123         | T213B115M050(1)S                               |
| 1.3                                                       | B            | 10                             | T111B135K050AS       | 1.0                                | 4                                                      | 1218                                                      | 1288       | 1358        | 1428         | 3124                       | 4124        | 5124         | T213B135K050(1)S                               |
| 1.3                                                       | B            | 20                             | T111B135M050AS       | 1.0                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 1.6                                                       | B            | 10                             | T111B165K050AS       | 1.2                                | 4                                                      | 1219                                                      | 1289       | 1359        | 1429         | 3125                       | 4125        | 5125         | T213B165K050(1)S                               |
| 1.6                                                       | B            | 20                             | T111B165M050AS       | 1.2                                | 4                                                      | 1220                                                      | 1290       | 1360        | 1430         | 3126                       | 4126        | 5126         | T213B165M050(1)S                               |
| 1.9                                                       | B            | 10                             | T111B195K050AS       | 1.5                                | 4                                                      | 1221                                                      | 1291       | 1361        | 1431         | 3127                       | 4127        | 5127         | T213B195K050(1)S                               |
| 1.9                                                       | B            | 20                             | T111B195M050AS       | 1.5                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 2.3                                                       | B            | 10                             | T111B235K050AS       | 1.7                                | 4                                                      | 1222                                                      | 1292       | 1362        | 1432         | 3128                       | 4128        | 5128         | T213B235K050(1)S                               |
| 2.3                                                       | B            | 20                             | T111B235M050AS       | 1.7                                | 4                                                      | 1223                                                      | 1293       | 1363        | 1433         | 3129                       | 4129        | 5129         | T213B235M050(1)S                               |
| 2.8                                                       | C            | 10                             | T111C285K050AS       | 2.2                                | 4                                                      | 1224                                                      | 1294       | 1364        | 1434         | 3130                       | 4130        | 5130         | T213C285K050(1)S                               |
| 2.8                                                       | C            | 20                             | T111C285M050AS       | 2.2                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 3.4                                                       | C            | 10                             | T111C345K050AS       | 2.2                                | 4                                                      | 1225                                                      | 1295       | 1365        | 1435         | 3131                       | 4131        | 5131         | T213C345K050(1)S                               |
| 3.4                                                       | C            | 20                             | T111C345M050AS       | 2.2                                | 4                                                      | 1226                                                      | 1296       | 1366        | 1436         | 3132                       | 4132        | 5132         | T213C345M050(1)S                               |
| 4.1                                                       | C            | 10                             | T111C415K050AS       | 2.5                                | 4                                                      | 1227                                                      | 1297       | 1367        | 1437         | 3133                       | 4133        | 5133         | T213C415K050(1)S                               |
| 4.1                                                       | C            | 20                             | T111C415M050AS       | 2.5                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 5.0                                                       | C            | 10                             | T111C505K050AS       | 2.5                                | 4                                                      | 1228                                                      | 1298       | 1368        | 1438         | 3134                       | 4134        | 5134         | T213C505K050(1)S                               |
| 5.0                                                       | C            | 20                             | T111C505M050AS       | 2.5                                | 4                                                      | 1229                                                      | 1299       | 1369        | 1439         | 3135                       | 4135        | 5135         | T213C505M050(1)S                               |
| 6.0                                                       | C            | 10                             | T111C605K050AS       | 3.0                                | 4                                                      | 0303                                                      | 0523       | 0743        | 0963         | 3136                       | 4136        | 5136         | T213C605K050(1)S                               |
| 6.0                                                       | C            | 20                             | T111C605M050AS       | 3.0                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 7.5                                                       | C            | 10                             | T111C755K050AS       | 4.1                                | 4                                                      | 0304                                                      | 0524       | 0744        | 0964         | 3137                       | 4137        | 5137         | T213C755K050(1)S                               |
| 7.5                                                       | C            | 20                             | T111C755M050AS       | 4.1                                | 4                                                      | 0305                                                      | 0525       | 0745        | 0965         | 3138                       | 4138        | 5138         | T213C755M050(1)S                               |
| 9.0                                                       | C            | 10                             | T111C905K050AS       | 4.5                                | 4                                                      | 0306                                                      | 0526       | 0746        | 0966         | 3139                       | 4139        | 5139         | T213C905K050(1)S                               |
| 9.0                                                       | C            | 20                             | T111C905M050AS       | 4.5                                | 4                                                      |                                                           |            |             |              |                            |             |              |                                                |
| 11.0                                                      | D            | 10                             | T111D116K050AS       | 5.5                                | 4                                                      | 0307                                                      | 0527       | 0747        | 0967         | 3140                       | 4140        | 5140         | T213D116K050(1)S                               |
| 11.0                                                      | D            | 20                             | T111D116M050AS       | 5.5                                | 4                                                      | 0308                                                      | 0528       | 0748        | 0968         | 3141                       | 4141        | 5141         | T213D116M050(1)S                               |
| 75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C          |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                                                |
| 0.34                                                      | A            | 10                             | T111A344K075AS       | 0.3                                | 2                                                      | 0309                                                      | 0529       | 0749        | 0969         | 3142                       | 4142        | 5142         | T213A344K075(1)S                               |
| 0.34                                                      | A            | 20                             | T111A344M075AS       | 0.3                                | 2                                                      | 0310                                                      | 0530       | 0750        | 0970         | 3143                       | 4143        | 5143         | T213A344M075(1)S                               |
| 0.41                                                      | B            | 10                             | T111B414K075AS       | 0.3                                | 2                                                      | 2008                                                      | 2108       | 2208        | 2308         | 3144                       | 4144        | 5144         | T213B414K075(1)S                               |
| 0.5                                                       | B            | 10                             | T111B504K075AS       | 0.4                                | 2                                                      | 2009                                                      | 2109       | 2209        | 2309         | 3145                       | 4145        | 5145         | T213B504K075(1)S                               |
| 0.5                                                       | B            | 20                             | T111B504M075AS       | 0.4                                | 2                                                      | 2010                                                      | 2110       | 2210        | 2310         | 3146                       | 4146        | 5146         | T213B504M075(1)S                               |
| 0.6                                                       | B            | 10                             | T111B604K075AS       | 0.4                                | 4                                                      | 2011                                                      | 2111       | 2211        | 2311         | 3147                       | 4147        | 5147         | T213B604K075(1)S                               |
| 0.75                                                      | B            | 10                             | T111B754K075AS       | 0.6                                | 4                                                      | 2012                                                      | 2112       | 2212        | 2312         | 3148                       | 4148        | 5148         | T213B754K075(1)S                               |
| 0.75                                                      | B            | 20                             | T111B754M075AS       | 0.6                                | 4                                                      | 2013                                                      | 2113       | 2213        | 2313         | 3149                       | 4149        | 5149         | T213B754M075(1)S                               |

(1) To complete T213 Series Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 6.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T111 SERIES    |                                    |                                                        | MIL-PRF-39003 (CSR91) CAPACITORS                          |            |             |              |                            |             |              |                                                |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|                                                           |              |                                |                      |                                    |                                                        | MIL-PRF-39003/4C<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/4C<br>GRADED |             |              |                                                |
|                                                           |              |                                |                      |                                    |                                                        | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                                                |
| 75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                                                |
| 0.9                                                       | B            | 10                             | T111B904K075AS       | 0.7                                | 4                                                      | 2014                                                      | 2114       | 2214        | 2314         | 3150                       | 4150        | 5150         | T213B904K075(1)S                               |
| 1.1                                                       | B            | 10                             | T111B115K075AS       | 0.8                                | 4                                                      | 2015                                                      | 2115       | 2215        | 2315         | 3151                       | 4151        | 5151         | T213B115K075(1)S                               |
| 1.1                                                       | B            | 20                             | T111B115M075AS       | 0.8                                | 4                                                      | 2016                                                      | 2116       | 2216        | 2316         | 3152                       | 4152        | 5152         | T213B115M075(1)S                               |
| 1.3                                                       | B            | 10                             | T111B135K075AS       | 1.0                                | 4                                                      | 2017                                                      | 2117       | 2217        | 2317         | 3153                       | 4153        | 5153         | T213B135K075(1)S                               |
| 1.6                                                       | B            | 10                             | T111B165K075AS       | 1.2                                | 4                                                      | 0311                                                      | 0531       | 0751        | 0971         | 3154                       | 4154        | 5154         | T213B165K075(1)S                               |
| 1.6                                                       | B            | 20                             | T111B165M075AS       | 1.2                                | 4                                                      | 0312                                                      | 0532       | 0752        | 0972         | 3155                       | 4155        | 5155         | T213B165M075(1)S                               |
| 1.9                                                       | B            | 10                             | T111B195K075AS       | 1.5                                | 4                                                      | 0313                                                      | 0533       | 0753        | 0973         | 3156                       | 4156        | 5156         | T213B195K075(1)S                               |
| 2.3                                                       | C            | 10                             | T111C235K075AS       | 3.0                                | 4                                                      | 2003                                                      | 2103       | 2203        | 2303         | 3157                       | 4157        | 5157         | T213C235K075(1)S                               |
| 2.3                                                       | C            | 20                             | T111C235M075AS       | 3.0                                | 4                                                      | 2004                                                      | 2104       | 2204        | 2304         | 3158                       | 4158        | 5158         | T213C235M075(1)S                               |
| 2.8                                                       | C            | 10                             | T111C285K075AS       | 3.0                                | 4                                                      | 2005                                                      | 2105       | 2205        | 2305         | 3159                       | 4159        | 5159         | T213C285K075(1)S                               |
| 3.4                                                       | C            | 10                             | T111C345K075AS       | 5.0                                | 4                                                      | 2006                                                      | 2106       | 2206        | 2306         | 3160                       | 4160        | 5160         | T213C345K075(1)S                               |
| 3.4                                                       | C            | 20                             | T111C345M075AS       | 5.0                                | 4                                                      | 2007                                                      | 2107       | 2207        | 2307         | 3161                       | 4161        | 5161         | T213C345M075(1)S                               |
| 4.1                                                       | C            | 10                             | T111C415K075AS       | 5.0                                | 4                                                      | 0314                                                      | 0534       | 0754        | 0974         | 3162                       | 4162        | 5162         | T213C415K075(1)S                               |
| 5.0                                                       | C            | 10                             | T111C505K075AS       | 5.0                                | 4                                                      | 0315                                                      | 0535       | 0755        | 0975         | 3163                       | 4163        | 5163         | T213C505K075(1)S                               |
| 5.0                                                       | C            | 20                             | T111C505M075AS       | 5.0                                | 4                                                      | 0316                                                      | 0536       | 0756        | 0976         | 3164                       | 4164        | 5164         | T213C505M075(1)S                               |
| 6.0                                                       | D            | 10                             | T111D605K075AS       | 5.0                                | 4                                                      | 0317                                                      | 0537       | 0757        | 0977         | 3165                       | 4165        | 5165         | T213D605K075(1)S                               |
| 7.5                                                       | D            | 10                             | T111D755K075AS       | 7.0                                | 4                                                      | 0318                                                      | 0538       | 0758        | 0978         | 3166                       | 4166        | 5166         | T213D755K075(1)S                               |
| 7.5                                                       | D            | 20                             | T111D755M075AS       | 7.0                                | 4                                                      | 0319                                                      | 0539       | 0759        | 0979         | 3167                       | 4167        | 5167         | T213D755M075(1)S                               |
| 100 VOLT RATING AT 85°C — 67 VOLT RATING AT 125°C         |              |                                |                      |                                    |                                                        |                                                           |            |             |              |                            |             |              |                                                |
| 0.0023                                                    | A            | 10                             | T111A232K100AS       | 0.3                                | 2                                                      | 0320                                                      | 0540       | 0760        | 0980         | 3168                       | 4168        | *            | T213A232K100(1)S                               |
| 0.0023                                                    | A            | 20                             | T111A232M100AS       | 0.3                                | 2                                                      | 0321                                                      | 0541       | 0761        | 0981         | 3169                       | 4169        | *            | T213A232M100(1)S                               |
| 0.0028                                                    | A            | 10                             | T111A282K100AS       | 0.3                                | 2                                                      | 0322                                                      | 0542       | 0762        | 0982         | 3170                       | 4170        | *            | T213A282K100(1)S                               |
| 0.0034                                                    | A            | 10                             | T111A342K100AS       | 0.3                                | 2                                                      | 0323                                                      | 0543       | 0763        | 0983         | 3171                       | 4171        | *            | T213A342K100(1)S                               |
| 0.0034                                                    | A            | 20                             | T111A342M100AS       | 0.3                                | 2                                                      | 0324                                                      | 0544       | 0764        | 0984         | 3172                       | 4172        | *            | T213A342M100(1)S                               |
| 0.0041                                                    | A            | 10                             | T111A412K100AS       | 0.3                                | 2                                                      | 0325                                                      | 0545       | 0765        | 0985         | 3173                       | 4173        | *            | T213A412K100(1)S                               |
| 0.005                                                     | A            | 10                             | T111A502K100AS       | 0.3                                | 2                                                      | 0326                                                      | 0546       | 0766        | 0986         | 3174                       | 4174        | *            | T213A502K100(1)S                               |
| 0.005                                                     | A            | 20                             | T111A502M100AS       | 0.3                                | 2                                                      | 0327                                                      | 0547       | 0767        | 0987         | 3175                       | 4175        | *            | T213A502M100(1)S                               |
| 0.006                                                     | A            | 10                             | T111A602K100AS       | 0.3                                | 2                                                      | 0328                                                      | 0548       | 0768        | 0988         | 3176                       | 4176        | *            | T213A602K100(1)S                               |
| 0.0075                                                    | A            | 10                             | T111A752K100AS       | 0.3                                | 2                                                      | 0329                                                      | 0549       | 0769        | 0989         | 3177                       | 4177        | *            | T213A752K100(1)S                               |
| 0.0075                                                    | A            | 20                             | T111A752M100AS       | 0.3                                | 2                                                      | 0330                                                      | 0550       | 0770        | 0990         | 3178                       | 4178        | *            | T213A752M100(1)S                               |
| 0.009                                                     | A            | 10                             | T111A902K100AS       | 0.3                                | 2                                                      | 0331                                                      | 0551       | 0771        | 0991         | 3179                       | 4179        | *            | T213A902K100(1)S                               |
| 0.011                                                     | A            | 10                             | T111A113K100AS       | 0.3                                | 2                                                      | 0332                                                      | 0552       | 0772        | 0992         | 3180                       | 4180        | *            | T213A113K100(1)S                               |
| 0.011                                                     | A            | 20                             | T111A113M100AS       | 0.3                                | 2                                                      | 0333                                                      | 0553       | 0773        | 0993         | 3181                       | 4181        | *            | T213A113M100(1)S                               |
| 0.013                                                     | A            | 10                             | T111A133K100AS       | 0.3                                | 2                                                      | 0334                                                      | 0554       | 0774        | 0994         | 3182                       | 4182        | *            | T213A133K100(1)S                               |
| 0.016                                                     | A            | 10                             | T111A163K100AS       | 0.3                                | 2                                                      | 0335                                                      | 0555       | 0775        | 0995         | 3183                       | 4183        | *            | T213A163K100(1)S                               |
| 0.016                                                     | A            | 20                             | T111A163M100AS       | 0.3                                | 2                                                      | 0336                                                      | 0556       | 0776        | 0996         | 3184                       | 4184        | *            | T213A163M100(1)S                               |
| 0.019                                                     | A            | 10                             | T111A193K100AS       | 0.3                                | 2                                                      | 0337                                                      | 0557       | 0777        | 0997         | 3185                       | 4185        | *            | T213A193K100(1)S                               |
| 0.023                                                     | A            | 10                             | T111A233K100AS       | 0.3                                | 2                                                      | 0338                                                      | 0558       | 0778        | 0998         | 3186                       | 4186        | *            | T213A233K100(1)S                               |
| 0.023                                                     | A            | 20                             | T111A233M100AS       | 0.3                                | 2                                                      | 0339                                                      | 0559       | 0779        | 0999         | 3187                       | 4187        | *            | T213A233M100(1)S                               |
| 0.028                                                     | A            | 10                             | T111A283K100AS       | 0.3                                | 2                                                      | 0340                                                      | 0560       | 0780        | 1000         | 3188                       | 4188        | *            | T213A283K100(1)S                               |
| 0.034                                                     | A            | 10                             | T111A343K100AS       | 0.3                                | 2                                                      | 0341                                                      | 0561       | 0781        | 1001         | 3189                       | 4189        | *            | T213A343K100(1)S                               |
| 0.034                                                     | A            | 20                             | T111A343M100AS       | 0.3                                | 2                                                      | 0342                                                      | 0562       | 0782        | 1002         | 3190                       | 4190        | *            | T213A343M100(1)S                               |
| 0.041                                                     | A            | 10                             | T111A413K100AS       | 0.3                                | 2                                                      | 0343                                                      | 0563       | 0783        | 1003         | 3191                       | 4191        | *            | T213A413K100(1)S                               |
| 0.05                                                      | A            | 10                             | T111A503K100AS       | 0.3                                | 2                                                      | 0344                                                      | 0564       | 0784        | 1004         | 3192                       | 4192        | *            | T213A503K100(1)S                               |
| 0.05                                                      | A            | 20                             | T111A503M100AS       | 0.3                                | 2                                                      | 0345                                                      | 0565       | 0785        | 1005         | 3193                       | 4193        | *            | T213A503M100(1)S                               |
| 0.06                                                      | A            | 10                             | T111A603K100AS       | 0.3                                | 2                                                      | 0346                                                      | 0566       | 0786        | 1006         | 3194                       | 4194        | *            | T213A603K100(1)S                               |
| 0.075                                                     | A            | 10                             | T111A753K100AS       | 0.3                                | 2                                                      | 0347                                                      | 0567       | 0787        | 1007         | 3195                       | 4195        | *            | T213A753K100(1)S                               |
| 0.075                                                     | A            | 20                             | T111A753M100AS       | 0.3                                | 2                                                      | 0348                                                      | 0568       | 0788        | 1008         | 3196                       | 4196        | *            | T213A753M100(1)S                               |
| 0.09                                                      | A            | 10                             | T111A903K100AS       | 0.3                                | 2                                                      | 0349                                                      | 0569       | 0789        | 1009         | 3197                       | 4197        | *            | T213A903K100(1)S                               |
| 0.11                                                      | A            | 10                             | T111A114K100AS       | 0.3                                | 2                                                      | 0350                                                      | 0570       | 0790        | 1010         | 3198                       | 4198        | *            | T213A114K100(1)S                               |
| 0.11                                                      | A            | 20                             | T111A114M100AS       | 0.3                                | 2                                                      | 0351                                                      | 0571       | 0791        | 1011         | 3199                       | 4199        | *            | T213A114M100(1)S                               |
| 0.13                                                      | A            | 10                             | T111A134K100AS       | 0.3                                | 2                                                      | 0352                                                      | 0572       | 0792        | 1012         | 3200                       | 4200        | *            | T213A134K100(1)S                               |
| 0.16                                                      | A            | 10                             | T111A164K100AS       | 0.3                                | 2                                                      | 0353                                                      | 0573       | 0793        | 1013         | 3201                       | 4201        | *            | T213A164K100(1)S                               |
| 0.16                                                      | A            | 20                             | T111A164M100AS       | 0.3                                | 2                                                      | 0354                                                      | 0574       | 0794        | 1014         | 3202                       | 4202        | *            | T213A164M100(1)S                               |
| 0.19                                                      | A            | 10                             | T111A194K100AS       | 0.3                                | 2                                                      | 0355                                                      | 0575       | 0795        | 1015         | 3203                       | 4203        | *            | T213A194K100(1)S                               |
| 0.23                                                      | A            | 10                             | T111A234K100AS       | 0.3                                | 2                                                      | 0356                                                      | 0576       | 0796        | 1016         | 3204                       | 4204        | *            | T213A234K100(1)S                               |
| 0.23                                                      | A            | 20                             | T111A234M100AS       | 0.3                                | 2                                                      | 0357                                                      | 0577       | 0797        | 1017         | 3205                       | 4205        | *            | T213A234M100(1)S                               |
| 0.28                                                      | A            | 10                             | T111A284K100AS       | 0.3                                | 2                                                      | 0358                                                      | 0578       | 0798        | 1018         | 3206                       | 4206        | *            | T213A284K100(1)S                               |
| 0.34                                                      | B            | 10                             | T111B344K100AS       | 0.3                                | 2                                                      | 0359                                                      | 0579       | 0799        | 1019         | 3207                       | 4207        | *            | T213B344K100(1)S                               |
| 0.34                                                      | B            | 20                             | T111B344M100AS       | 0.3                                | 2                                                      | 0360                                                      | 0580       | 0800        | 1020         | 3208                       | 4208        | *            | T213B344M100(1)S                               |
| 0.41                                                      | B            | 10                             | T111B414K100AS       | 0.4                                | 2                                                      | 0361                                                      | 0581       | 0801        | 1021         | 3209                       | 4209        | *            | T213B414K100(1)S                               |
| 0.5                                                       | B            | 10                             | T111B504K100AS       | 0.5                                | 2                                                      | 0362                                                      | 0582       | 0802        | 1022         | 3210                       | 4210        | *            | T213B504K100(1)S                               |
| 0.5                                                       | B            | 20                             | T111B504M100AS       | 0.5                                | 2                                                      | 0363                                                      | 0583       | 0803        | 1023         | 3211                       | 4211        | *            | T213B504M100(1)S                               |
| 0.6                                                       | B            | 10                             | T111B604K100AS       | 0.5                                | 3                                                      | 0364                                                      | 0584       | 0804        | 1024         | 3212                       | 4212        | *            | T213B604K100(1)S                               |
| 0.75                                                      | B            | 10                             | T111B754K100AS       | 0.7                                | 3                                                      | 0365                                                      | 0585       | 0805        | 1025         | 3213                       | 4213        | *            | T213B754K100(1)S                               |
| 0.75                                                      | B            | 20                             | T111B754M100AS       | 0.7                                | 3                                                      | 0366                                                      | 0586       | 0806        | 1026         | 3214                       | 4214        | *            | T213B754M100(1)S                               |
| 0.9                                                       | B            | 10                             | T111B904K100AS       | 0.7                                | 3                                                      | 0367                                                      | 0587       | 0807        | 1027         | 3215                       | 4215        | *            | T213B904K100(1)S                               |
| 1.1                                                       | B            | 10                             | T111B115K100AS       | 0.9                                | 3                                                      | 0368                                                      | 0588       | 0808        | 1028         | 3216                       | 4216        | *            | T213B115K100(1)S                               |
| 1.1                                                       | B            | 20                             | T111B115M100AS       | 0.9                                | 3                                                      | 0369                                                      | 0589       | 0809        | 1029         | 3217                       | 4217        | *            | T213B115M100(1)S                               |
| 1.3                                                       | B            | 10                             | T111B135K100AS       | 1.1                                | 3                                                      | 0370                                                      | 0590       | 0810        | 1030         | 3218                       | 4218        | *            | T213B135K100(1)S                               |

(1) To complete T213 Series Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 6.

\*Note: D failure rate — Not QPL for 5168 thru 5218

KEMET ultra-miniature T222 Series solid tantalum capacitors are designed especially for miniaturization.

The T222 Series capacitors employ a unique glass-to-metal compression end seal which has no protruding eyelet. This flush end seal construction makes T222 Series capacitors ideally suited for all miniature high density packaging applications. The capacitors con-

sist of a dry porous tantalum pellet hermetically sealed in a solder coated metal case with solder coated alloy 52 and solder coated nickel leads.

The T222 series is approved to MIL-PRF-39003/2, all ratings and failure rates.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | UNINSULATED                       |                                           | INSULATED                |                                           | B<br>WIRE<br>DIAMETER                    |
|-----------|-----------------------------------|-------------------------------------------|--------------------------|-------------------------------------------|------------------------------------------|
|           | D<br>$\pm 0.005$<br>( $\pm .13$ ) | L                                         | D                        | L                                         |                                          |
| A         | .085 (2.16)                       | .245 + .015 (6.22 + .38)<br>- .010 (-.25) | .090 ± .009 (2.29 ± .23) | .250 + .031 (6.35 + .79)<br>- .015 (-.38) | .016 + .005 (.41 + .13)<br>- .001 (-.03) |
| B         | .127 (3.23)                       | .375 ± .015 (.53 ± .38)                   | .138 ± .010 (3.51 ± .25) | .390 ± .015 (9.91 ± .38)                  | .016 + .005 (.41 + .13)<br>- .001 (-.03) |

### ORDERING INFORMATION



\*Part Number Example: T222A225K010BS (14 digits - no spaces)

#### FAILURE RATE LEVEL\*\*

| GRADED            | EXPONENTIAL       |
|-------------------|-------------------|
| B — 0.1%/k hrs.   | M — 1%/k hrs.     |
| C — 0.01%/k hrs.  | P — 0.1%/k hrs.   |
| D — 0.001%/k hrs. | R — 0.01%/k hrs.  |
| .                 | S — 0.001%/k hrs. |

\*\*Failure Rates apply only to military products

For Military Ordering, see page 4.

### CSR09 CAPACITOR MARKINGS PER MIL-PRF-39003

|        |                                                                                            |
|--------|--------------------------------------------------------------------------------------------|
| 39003  | — Military specification number                                                            |
| 02 - K | — Specification sheet number and trademark                                                 |
| 2961J  | — Nonsignificant dash number and "J" for JAN                                               |
| +333   | — Polarity, date code (1st digit indicates year and the next two digits indicate the week) |
| XX     | — and lot symbol                                                                           |

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                                  | CASE<br>SIZE                                   | CAPACITANCE<br>TOLERANCE<br>±%                      | KEMET T222 SERIES                                                                                                                                                                                    |                                                                    |                                                        | MIL-PRF-39003 (CSR09) CAPACITORS                                             |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
|--------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                                                                    |                                                |                                                     | KEMET<br>PART NUMBER                                                                                                                                                                                 | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX.                                 | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.)                    |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
|                                                                    |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        | MIL-PRF-39003/2D<br>EXPONENTIAL                                              |                                                                              |                                                                              |                                                                              | MIL-PRF-39003/2D<br>GRADED                                                   |                                                                              |                                                                              |
|                                                                    |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        | M<br>(1.0)                                                                   | P<br>(0.1)                                                                   | R<br>(0.01)                                                                  | S<br>(0.001)                                                                 | B<br>(0.1)                                                                   | C<br>(0.01)                                                                  | D<br>(0.001)                                                                 |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C                     |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
| 2.7<br>2.7                                                         | A<br>A                                         | 5<br>10                                             | T222A275J006(1)S<br>T222A275K006(1)S                                                                                                                                                                 | 0.6<br>0.6                                                         | 6<br>6                                                 | 1001<br>0001                                                                 | 1061<br>0061                                                                 | 1121<br>0121                                                                 | 1181<br>0181                                                                 | 2001<br>2002                                                                 | 3001<br>3002                                                                 | 4001<br>4002                                                                 |
| 18.0<br>18.0                                                       | B<br>B                                         | 5<br>10                                             | T222B186J006(1)S<br>T222B186K006(1)S                                                                                                                                                                 | 1.4<br>1.4                                                         | 6<br>6                                                 | 1002<br>0002                                                                 | 1062<br>0062                                                                 | 1122<br>0122                                                                 | 1182<br>0182                                                                 | 2003<br>2004                                                                 | 3003<br>3004                                                                 | 4003<br>4004                                                                 |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C                    |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
| 1.8<br>1.8<br>2.2<br>2.2                                           | A<br>A<br>A<br>A                               | 5<br>10<br>5<br>10                                  | T222A185J010(1)S<br>T222A185K010(1)S<br>T222A225J010(1)S<br>T222A225K010(1)S                                                                                                                         | 0.6<br>0.6<br>0.6<br>0.6                                           | 6<br>6<br>6<br>6                                       | 1007<br>0007<br>1008<br>0008                                                 | 1067<br>0067<br>1068<br>0068                                                 | 1127<br>0127<br>1128<br>0128                                                 | 1187<br>0187<br>1188<br>0188                                                 | 2005<br>2006<br>2007<br>2008                                                 | 3005<br>3006<br>3007<br>3008                                                 | 4005<br>4006<br>4007<br>4008                                                 |
| 10.0<br>10.0<br>12.0<br>12.0<br>15.0<br>15.0                       | B<br>B<br>B<br>B<br>B<br>B                     | 5<br>10<br>5<br>10<br>5<br>10                       | T222B106J010(1)S<br>T222B106K010(1)S<br>T222B126J010(1)S<br>T222B126K010(1)S<br>T222B156J010(1)S<br>T222B156K010(1)S                                                                                 | 2.0<br>2.0<br>2.0<br>2.0<br>2.0<br>2.0                             | 6<br>6<br>6<br>6<br>6<br>6                             | 1009<br>0009<br>1010<br>0010<br>1011<br>0011                                 | 1069<br>0069<br>1070<br>0070<br>1071<br>0071                                 | 1129<br>0129<br>1130<br>0130<br>1131<br>0131                                 | 1189<br>0189<br>1190<br>0190<br>1191<br>0191                                 | 2009<br>2010<br>2011<br>2012<br>2013<br>2014                                 | 3009<br>3010<br>3011<br>3012<br>3013<br>3014                                 | 4009<br>4010<br>4011<br>4012<br>4013<br>4014                                 |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C                   |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
| 1.0<br>1.0<br>1.2<br>1.2<br>1.5<br>1.5                             | A<br>A<br>A<br>A<br>A<br>A                     | 5<br>10<br>5<br>10<br>5<br>10                       | T222A105J015(1)S<br>T222A105K015(1)S<br>T222A125J015(1)S<br>T222A125K015(1)S<br>T222A155J015(1)S<br>T222A155K015(1)S                                                                                 | 0.6<br>0.6<br>0.6<br>0.6<br>0.6<br>0.6                             | 6<br>6<br>6<br>6<br>6<br>6                             | 1012<br>0012<br>1013<br>0013<br>1014<br>0014                                 | 1072<br>0072<br>1073<br>0073<br>1074<br>0074                                 | 1132<br>0132<br>1133<br>0133<br>1134<br>0134                                 | 1192<br>0192<br>1193<br>0193<br>1194<br>0194                                 | 2015<br>2016<br>2017<br>2018<br>2019<br>2020                                 | 3015<br>3016<br>3017<br>3018<br>3019<br>3020                                 | 4015<br>4016<br>4017<br>4018<br>4019<br>4020                                 |
| 8.2<br>8.2                                                         | B<br>B                                         | 5<br>10                                             | T222B825J015(1)S<br>T222B825K015(1)S                                                                                                                                                                 | 1.8<br>1.8                                                         | 6<br>6                                                 | 1015<br>0015                                                                 | 1075<br>0075                                                                 | 1135<br>0135                                                                 | 1195<br>0195                                                                 | 2021<br>2022                                                                 | 3021<br>3022                                                                 | 4021<br>4022                                                                 |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C                   |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
| 0.56<br>0.56<br>0.68<br>0.68<br>0.82<br>0.82<br>1.0<br>1.0         | A<br>A<br>A<br>A<br>A<br>A<br>A<br>A           | 5<br>10<br>5<br>10<br>5<br>10<br>5<br>10            | T222A564J020(1)S<br>T222A564K020(1)S<br>T222A684J020(1)S<br>T222A684K020(1)S<br>T222A824J020(1)S<br>T222A824K020(1)S<br>T222A105J020(1)S<br>T222A105K020(1)S                                         | 0.6<br>0.6<br>0.6<br>0.6<br>0.6<br>0.6<br>0.6<br>0.6               | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                   | 1016<br>0016<br>1017<br>0017<br>1018<br>0018<br>1019<br>0019                 | 1076<br>0076<br>1077<br>0077<br>1078<br>0078<br>1079<br>0079                 | 1136<br>0136<br>1137<br>0137<br>1138<br>0138<br>1139<br>0139                 | 1196<br>0196<br>1197<br>0197<br>1198<br>0198<br>1199<br>0199                 | 2023<br>2024<br>2025<br>2026<br>2027<br>2028<br>2029<br>2030                 | 3023<br>3024<br>3025<br>3026<br>3027<br>3028<br>3029<br>3030                 | 4023<br>4024<br>4025<br>4026<br>4027<br>4028<br>4029<br>4030                 |
| 3.3<br>3.3<br>3.9<br>3.9<br>4.7<br>4.7<br>5.6<br>5.6<br>6.8<br>6.8 | B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B | 5<br>10<br>5<br>10<br>5<br>10<br>5<br>10<br>5<br>10 | T222B335J020(1)S<br>T222B335K020(1)S<br>T222B395J020(1)S<br>T222B395K020(1)S<br>T222B475J020(1)S<br>T222B475K020(1)S<br>T222B565J020(1)S<br>T222B565K020(1)S<br>T222B685J020(1)S<br>T222B685K020(1)S | 1.0<br>1.0<br>2.0<br>2.0<br>2.0<br>2.0<br>2.0<br>2.0<br>2.0<br>2.0 | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3         | 1020<br>0020<br>1021<br>0021<br>1022<br>0022<br>1023<br>0023<br>1024<br>0024 | 1080<br>0080<br>1081<br>0081<br>1082<br>0082<br>1083<br>0083<br>1084<br>0084 | 1140<br>0140<br>1141<br>0141<br>1142<br>0142<br>1143<br>0143<br>1144<br>0144 | 1200<br>0200<br>1201<br>0201<br>1202<br>0202<br>1203<br>0203<br>1204<br>0204 | 2031<br>2032<br>2033<br>2034<br>2035<br>2036<br>2037<br>2038<br>2039<br>2040 | 3031<br>3032<br>3033<br>3034<br>3035<br>3036<br>3037<br>3038<br>3039<br>3040 | 4031<br>4032<br>4033<br>4034<br>4035<br>4036<br>4037<br>4038<br>4039<br>4040 |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C                   |                                                |                                                     |                                                                                                                                                                                                      |                                                                    |                                                        |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |                                                                              |
| 0.33<br>0.33<br>0.39<br>0.39<br>0.47<br>0.47                       | A<br>A<br>A<br>A<br>A<br>A                     | 5<br>10<br>5<br>10<br>5<br>10                       | T222A334J035(1)S<br>T222A334K035(1)S<br>T222A394J035(1)S<br>T222A394K035(1)S<br>T222A474J035(1)S<br>T222A474K035(1)S                                                                                 | 0.6<br>0.6<br>0.6<br>0.6<br>0.6<br>0.6                             | 3<br>3<br>3<br>3<br>3<br>3                             | 1025<br>0025<br>1026<br>0026<br>1027<br>0027                                 | 1085<br>0085<br>1086<br>0086<br>1087<br>0087                                 | 1145<br>0145<br>1146<br>0146<br>1147<br>0147                                 | 1205<br>0205<br>1206<br>0206<br>1207<br>0207                                 | 2041<br>2042<br>2043<br>2044<br>2045<br>2046                                 | 3041<br>3042<br>3043<br>3044<br>3045<br>3046                                 | 4041<br>4042<br>4043<br>4044<br>4045<br>4046                                 |
| 2.2<br>2.2<br>2.7<br>2.7                                           | B<br>B<br>B<br>B                               | 5<br>10<br>5<br>10                                  | T222B225J035(1)S<br>T222B225K035(1)S<br>T222B275J035(1)S<br>T222B275K035(1)S                                                                                                                         | 1.4<br>1.4<br>1.4<br>1.4                                           | 3<br>3<br>3<br>3                                       | 1028<br>0028<br>1029<br>0029                                                 | 1088<br>0088<br>1089<br>0089                                                 | 1148<br>0148<br>1149<br>0149                                                 | 1208<br>0208<br>1209<br>0209                                                 | 2047<br>2048<br>2049<br>2050                                                 | 3047<br>3048<br>3049<br>3050                                                 | 4047<br>4048<br>4049<br>4050                                                 |

(1) To complete Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 24.

Bold Face lines indicate popular part types and values



## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T222 SERIES       |                                    |                                                        | MIL-PRF-39003 (CSR09) CAPACITORS |             |             |              |                            |             |              |
|---------------------------------------------------------|--------------|--------------------------------|-------------------------|------------------------------------|--------------------------------------------------------|----------------------------------|-------------|-------------|--------------|----------------------------|-------------|--------------|
|                                                         |              |                                | KEMET<br>PART NUMBER    | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE            |             |             |              |                            |             |              |
|                                                         |              |                                |                         |                                    |                                                        | FAILURE RATE LEVEL (%/1000 HRS.) |             |             |              |                            |             |              |
|                                                         |              |                                |                         |                                    |                                                        | MIL-PRF-39003/2D<br>EXPONENTIAL  |             |             |              | MIL-PRF-39003/2D<br>GRADED |             |              |
|                                                         |              |                                |                         |                                    |                                                        | M<br>(1.0)                       | P<br>(0.1)  | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |
| <b>50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C</b> |              |                                |                         |                                    |                                                        |                                  |             |             |              |                            |             |              |
| 0.22                                                    | A            | 5                              | T222A224J050(1)S        | 0.6                                | 3                                                      | 1030                             | 1090        | 1150        | 1210         | 2051                       | 3051        | 4051         |
| 0.22                                                    | A            | 10                             | T222A224K050(1)S        | 0.6                                | 3                                                      | 0030                             | 0090        | 0150        | 0210         | 2052                       | 3052        | 4052         |
| 0.27                                                    | A            | 5                              | T222A274J050(1)S        | 0.6                                | 3                                                      | 1031                             | 1091        | 1151        | 1211         | 2053                       | 3053        | 4053         |
| <b>0.27</b>                                             | <b>A</b>     | <b>10</b>                      | <b>T222A274K050(1)S</b> | <b>0.6</b>                         | <b>3</b>                                               | <b>0031</b>                      | <b>0091</b> | <b>0151</b> | <b>0211</b>  | <b>2054</b>                | <b>3054</b> | <b>4054</b>  |
| 1.5                                                     | B            | 5                              | T222B155J050(1)S        | 1.4                                | 3                                                      | 1032                             | 1092        | 1152        | 1212         | 2055                       | 3055        | 4055         |
| 1.5                                                     | B            | 10                             | T222B155K050(1)S        | 1.4                                | 3                                                      | 0032                             | 0092        | 0152        | 0212         | 2056                       | 3056        | 4056         |
| 1.8                                                     | B            | 5                              | T222B185J050(1)S        | 1.4                                | 3                                                      | 1033                             | 1093        | 1153        | 1213         | 2057                       | 3057        | 4057         |
| <b>1.8</b>                                              | <b>B</b>     | <b>10</b>                      | <b>T222B185K050(1)S</b> | <b>1.4</b>                         | <b>3</b>                                               | <b>0033</b>                      | <b>0093</b> | <b>0153</b> | <b>0213</b>  | <b>2058</b>                | <b>3058</b> | <b>4058</b>  |
| <b>75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C</b> |              |                                |                         |                                    |                                                        |                                  |             |             |              |                            |             |              |
| 0.047                                                   | A            | 5                              | T222A473J075(1)S        | 0.6                                | 3                                                      | 1034                             | 1094        | 1154        | 1214         | 2059                       | 3059        | 4059         |
| 0.047                                                   | A            | 10                             | T222A473K075(1)S        | 0.6                                | 3                                                      | 0034                             | 0094        | 0154        | 0214         | 2060                       | 3060        | 4060         |
| 0.056                                                   | A            | 5                              | T222A563J075(1)S        | 0.6                                | 3                                                      | 1035                             | 1095        | 1155        | 1215         | 2061                       | 3061        | 4061         |
| 0.056                                                   | A            | 10                             | T222A563K075(1)S        | 0.6                                | 3                                                      | 0035                             | 0095        | 0155        | 0215         | 2062                       | 3062        | 4062         |
| 0.068                                                   | A            | 5                              | T222A683J075(1)S        | 0.6                                | 3                                                      | 1036                             | 1096        | 1156        | 1216         | 2063                       | 3063        | 4063         |
| 0.068                                                   | A            | 10                             | T222A683K075(1)S        | 0.6                                | 3                                                      | 0036                             | 0096        | 0156        | 0216         | 2064                       | 3064        | 4064         |
| 0.082                                                   | A            | 5                              | T222A823J075(1)S        | 0.6                                | 3                                                      | 1037                             | 1097        | 1157        | 1217         | 2065                       | 3065        | 4065         |
| 0.082                                                   | A            | 10                             | T222A823K075(1)S        | 0.6                                | 3                                                      | 0037                             | 0097        | 0157        | 0217         | 2066                       | 3066        | 4066         |
| 0.10                                                    | A            | 5                              | T222A104J075(1)S        | 0.6                                | 3                                                      | 1038                             | 1098        | 1158        | 1218         | 2067                       | 3067        | 4067         |
| <b>0.10</b>                                             | <b>A</b>     | <b>10</b>                      | <b>T222A104K075(1)S</b> | <b>0.6</b>                         | <b>3</b>                                               | <b>0038</b>                      | <b>0098</b> | <b>0158</b> | <b>0218</b>  | <b>2068</b>                | <b>3068</b> | <b>4068</b>  |
| 0.12                                                    | A            | 5                              | T222A124J075(1)S        | 0.6                                | 3                                                      | 1039                             | 1099        | 1159        | 1219         | 2069                       | 3069        | 4069         |
| 0.12                                                    | A            | 10                             | T222A124K075(1)S        | 0.6                                | 3                                                      | 0039                             | 0099        | 0159        | 0219         | 2070                       | 3070        | 4070         |
| 0.15                                                    | A            | 5                              | T222A154J075(1)S        | 0.6                                | 3                                                      | 1040                             | 1100        | 1160        | 1220         | 2071                       | 3071        | 4071         |
| 0.15                                                    | A            | 10                             | T222A154K075(1)S        | 0.6                                | 3                                                      | 0040                             | 0100        | 0160        | 0220         | 2072                       | 3072        | 4072         |
| 0.18                                                    | A            | 5                              | T222A184J075(1)S        | 0.6                                | 3                                                      | 1041                             | 1101        | 1161        | 1221         | 2073                       | 3073        | 4073         |
| 0.18                                                    | A            | 10                             | T222A184K075(1)S        | 0.6                                | 3                                                      | 0041                             | 0101        | 0161        | 0221         | 2074                       | 3074        | 4074         |
| 0.22                                                    | B            | 5                              | T222B224J075(1)S        | 0.6                                | 3                                                      | 1042                             | 1102        | 1162        | 1222         | 2075                       | 3075        | 4075         |
| 0.22                                                    | B            | 10                             | T222B224K075(1)S        | 0.6                                | 3                                                      | 0042                             | 0102        | 0162        | 0222         | 2076                       | 3076        | 4076         |
| 0.27                                                    | B            | 5                              | T222B274J075(1)S        | 0.6                                | 3                                                      | 1043                             | 1103        | 1163        | 1223         | 2077                       | 3077        | 4077         |
| 0.27                                                    | B            | 10                             | T222B274K075(1)S        | 0.6                                | 3                                                      | 0043                             | 0103        | 0163        | 0223         | 2078                       | 3078        | 4078         |
| 0.33                                                    | B            | 5                              | T222B334J075(1)S        | 0.6                                | 3                                                      | 1044                             | 1104        | 1164        | 1224         | 2079                       | 3079        | 4079         |
| 0.33                                                    | B            | 10                             | T222B334K075(1)S        | 0.6                                | 3                                                      | 0044                             | 0104        | 0164        | 0224         | 2080                       | 3080        | 4080         |
| 0.39                                                    | B            | 5                              | T222B394J075(1)S        | 0.6                                | 3                                                      | 1045                             | 1105        | 1165        | 1225         | 2081                       | 3081        | 4081         |
| 0.39                                                    | B            | 10                             | T222B394K075(1)S        | 0.6                                | 3                                                      | 0045                             | 0105        | 0165        | 0225         | 2082                       | 3082        | 4082         |
| 0.47                                                    | B            | 5                              | T222B474J075(1)S        | 0.6                                | 3                                                      | 1046                             | 1106        | 1166        | 1226         | 2083                       | 3083        | 4083         |
| 0.47                                                    | B            | 10                             | T222B474K075(1)S        | 0.6                                | 3                                                      | 0046                             | 0106        | 0166        | 0226         | 2084                       | 3084        | 4084         |
| 0.56                                                    | B            | 5                              | T222B564J075(1)S        | 0.6                                | 3                                                      | 1047                             | 1107        | 1167        | 1227         | 2085                       | 3085        | 4085         |
| 0.56                                                    | B            | 10                             | T222B564K075(1)S        | 0.6                                | 3                                                      | 0047                             | 0107        | 0167        | 0227         | 2086                       | 3086        | 4086         |
| 0.68                                                    | B            | 5                              | T222B684J075(1)S        | 0.6                                | 3                                                      | 1048                             | 1108        | 1168        | 1228         | 2087                       | 3087        | 4087         |
| 0.68                                                    | B            | 10                             | T222B684K075(1)S        | 0.6                                | 3                                                      | 0048                             | 0108        | 0168        | 0228         | 2088                       | 3088        | 4088         |
| 0.82                                                    | B            | 5                              | T222B824J075(1)S        | 0.7                                | 3                                                      | 1049                             | 1109        | 1169        | 1229         | 2089                       | 3089        | 4089         |
| 0.82                                                    | B            | 10                             | T222B824K075(1)S        | 0.7                                | 3                                                      | 0049                             | 0109        | 0169        | 0229         | 2090                       | 3090        | 4090         |
| 1.0                                                     | B            | 5                              | T222B105J075(1)S        | 0.9                                | 3                                                      | 1050                             | 1110        | 1170        | 1230         | 2091                       | 3091        | 4091         |
| 1.0                                                     | B            | 10                             | T222B105K075(1)S        | 0.9                                | 3                                                      | 0050                             | 0110        | 0170        | 0230         | 2092                       | 3092        | 4092         |
| 1.2                                                     | B            | 5                              | T222B125J075(1)S        | 0.9                                | 3                                                      | 1051                             | 1111        | 1171        | 1231         | 2093                       | 3093        | 4093         |
| 1.2                                                     | B            | 10                             | T222B125K075(1)S        | 0.9                                | 3                                                      | 0051                             | 0111        | 0171        | 0231         | 2094                       | 3094        | 4094         |

(1) To complete Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 24.

Bold Face lines indicate popular part types and values

KEMET standard MIL case hermetically sealed T140 Series (Extended Capacitance Range) are compact, ruggedly built, designed for miniturized circuitry, and are especially suited for coupling, bypass, filtering and R-C timing circuits. They exhibit excellent stability, low DC leakage current, dissipation factor, and ESR/impedance over a wide temperature and frequency range.

Available in standard EIA capacitance values from .82-1200  $\mu$ F in  $\pm 20\%$ ,  $\pm 10\%$ , and  $\pm 5\%$  tolerances and working voltages from 6-60 VDC.

Included in the following Series table is a complete listing of CSR23 qualified MIL-C-39003/3 capacitors.

## DIMENSIONS — INCHES &amp; (MILLIMETERS)

| CASE SIZE | UNINSULATED               |                           | INSULATED                 |                           | B<br>$\pm 0.002$<br>(.05) | C<br>MAX.        |
|-----------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------|
|           | D<br>$\pm 0.005$<br>(.13) | L<br>$\pm 0.031$<br>(.79) | D<br>$\pm 0.010$<br>(.25) | L<br>$\pm 0.031$<br>(.79) |                           |                  |
| A         | 0.125<br>(3.18)           | 0.250<br>(6.35)           | 0.135<br>(3.43)           | 0.286<br>(7.26)           | 0.020<br>(.51)            | 0.422<br>(10.72) |
| B         | 0.175<br>(4.45)           | 0.438<br>(11.13)          | 0.185<br>(4.70)           | 0.474<br>(12.04)          | 0.020<br>(.51)            | 0.610<br>(15.49) |
| C         | 0.279<br>(7.09)           | 0.650<br>(16.51)          | 0.289<br>(7.34)           | 0.686<br>(17.42)          | 0.025<br>(.64)            | 0.822<br>(20.88) |
| D         | 0.341<br>(8.66)           | 0.750<br>(19.05)          | 0.351<br>(8.92)           | 0.786<br>(19.96)          | 0.025<br>(.64)            | 0.922<br>(23.42) |

## MARKING INFORMATION\*

## A, B, C &amp; D CASES

|             |                                                                |
|-------------|----------------------------------------------------------------|
| +K 10%      | — Polarity, Manufacturer's Identification and Capacitance Tol. |
| 5R6 $\mu$ F | — Normal Capacitance — ( $\mu$ F) ("R" indicates decimal)      |
| 10V         | — Voltage                                                      |
| 0312        | — Date Code (e.g.: 0312)                                       |

\* For Military Marking, see page 4.

## CAPACITOR OUTLINE DRAWINGS



Effective September 30, 2005, the KEMET T140 Series is RoHS compliant by ordering the "T" (100% tin) end termination in the 14th position of the part number.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                              | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T140           |                                    |                                                   | MIL-PRF-39003 (CSR23) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                |              |                                |                      |                                    |                                                   | MIL-PRF-39003/3F<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/3F<br>GRADED |             |              |                  |                                                |
|                                                |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 8.2                                            | A            | 10, 20                         | T140A825(1)006AS     | 0.9                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                           | A            | 10                             | T140A106K006AS       | 0.9                                | 6                                                 | 0101                                                      | 0201       | 0301        | 0401         | 2001                       | 3001        | 4001         | T242A106K006(2)S |                                                |
| 10.0                                           | A            | 20                             | T140A106M006AS       | 0.9                                | 6                                                 | 0102                                                      | 0202       | 0302        | 0402         | 2002                       | 3002        | 4002         | T242A106M006(2)S |                                                |
| 12.0                                           | A            | 10                             | T140A126K006AS       | 1.0                                | 6                                                 | 0103                                                      | 0203       | 0303        | 0403         | 2003                       | 3003        | 4003         | T242A126K006(2)S |                                                |
| 12.0                                           | A            | 20                             | T140A126M006AS       | 1.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 68.0                                           | B            | 10, 20                         | T140B686(1)006AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 82.0                                           | B            | 10, 20                         | T140B826(1)006AS     | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 100.0                                          | B            | 10                             | T140B107K006AS       | 6.0                                | 6                                                 | 0104                                                      | 0204       | 0304        | 0404         | 2004                       | 3004        | 4004         | T242B107K006(2)S |                                                |
| 100.0                                          | B            | 20                             | T140B107M006AS       | 6.0                                | 6                                                 | 0105                                                      | 0205       | 0305        | 0405         | 2005                       | 3005        | 4005         | T242B107M006(2)S |                                                |
| 220.0                                          | C            | 10, 20                         | T140C227(1)006AS     | 10.0                               | 8                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 270.0                                          | C            | 10, 20                         | T140C277(1)006AS     | 10.0                               | 8                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 330.0                                          | C            | 10                             | T140C337K006AS       | 10.0                               | 8                                                 | 0106                                                      | 0206       | 0306        | 0406         | 2006                       | 3006        | 4006         | T242C337K006(2)S |                                                |
| 330.0                                          | C            | 20                             | T140C337M006AS       | 10.0                               | 8                                                 | 0107                                                      | 0207       | 0307        | 0407         | 2007                       | 3007        | 4007         | T242C337M006(2)S |                                                |
| 390.0                                          | C            | 10                             | T140C397K006AS       | 10.0                               | 10                                                | 0108                                                      | 0208       | 0308        | 0408         | 2008                       | 3008        | 4008         | T242C397K006(2)S |                                                |
| 390.0                                          | C            | 20                             | T140C397M006AS       | 10.0                               | 10                                                |                                                           |            |             |              |                            |             |              |                  |                                                |
| 470.0                                          | C            | 10                             | T140C477K006AS       | 10.0                               | 10                                                | 0109                                                      | 0209       | 0309        | 0409         | 2009                       | 3009        | 4009         | T242C477K006(2)S |                                                |
| 470.0                                          | C            | 20                             | T140C477M006AS       | 10.0                               | 10                                                | 0110                                                      | 0210       | 0310        | 0410         | 2010                       | 3010        | 4010         | T242C477M006(2)S |                                                |
| 560.0                                          | D            | 10, 20                         | T140D567(1)006AS     | 20.0                               | 10                                                |                                                           |            |             |              |                            |             |              |                  |                                                |
| 680.0                                          | D            | 10                             | T140D687K006AS       | 20.0                               | 10                                                | 0111                                                      | 0211       | 0311        | 0411         | 2011                       | 3011        | 4011         | T242D687K006(2)S |                                                |
| 680.0                                          | D            | 20                             | T140D687M006AS       | 20.0                               | 10                                                | 0112                                                      | 0212       | 0312        | 0412         | 2012                       | 3012        | 4012         | T242D687M006(2)S |                                                |
| 820.0                                          | D            | 10                             | T140D827K006AS       | 20.0                               | 10                                                | 0113                                                      | 0213       | 0313        | 0413         | 2013                       | 3013        | 4013         | T242D827K006(2)S |                                                |
| 820.0                                          | D            | 20                             | T140D827M006AS       | 20.0                               | 10                                                |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1000.0                                         | D            | 10                             | T140D108K006AS       | 20.0                               | 10                                                | 0114                                                      | 0214       | 0314        | 0414         | 2014                       | 3014        | 4014         | T242D108K006(2)S |                                                |
| 1000.0                                         | D            | 20                             | T140D108M006AS       | 20.0                               | 10                                                | 0115                                                      | 0215       | 0315        | 0415         | 2015                       | 3015        | 4015         | T242D108M006(2)S |                                                |
| 1200.0                                         | D            | 20                             | T140D128M006AS       | 20.0                               | 10                                                |                                                           |            |             |              |                            |             |              |                  |                                                |

(1) To complete T140 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T242 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

For ordering information, see page 4 (Military) and Page 6.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T140 SERIES — POLAR TYPE & T242 (CSR23)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T140           |                                     |                                                   | MIL-PRF-39003 (CSR23) CAPACITORS                          |            |             |              |                            |             |              |  |  |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|--------------------------------------------------|--------------|--------------------------------|----------------------|-------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|--|--|--|------------------------------------------------|
|                                                  |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C,<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |  |  |  |                                                |
|                                                  |              |                                |                      |                                     |                                                   | MIL-PRF-39003/3F<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/3F<br>GRADED |             |              |  |  |  |                                                |
|                                                  |              |                                |                      |                                     |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |  |  |  |                                                |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C  |              |                                |                      |                                     |                                                   |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 5.6                                              | A            | 10, 20                         | T140A565(1)010AS     | 1.0                                 | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 6.8                                              | A            | 10                             | T140A685K010AS       | 1.0                                 | 6                                                 | 0116                                                      | 0216       | 0316        | 0416         | 2016                       | 3016        | 4016         |  |  |  | T242A685K010(2)S                               |
| 6.8                                              | A            | 20                             | T140A685M010AS       | 1.0                                 | 6                                                 | 0117                                                      | 0217       | 0317        | 0417         | 2017                       | 3017        | 4017         |  |  |  | T242A685M010(2)S                               |
| 8.2                                              | A            | 10                             | T140A825K010AS       | 1.2                                 | 6                                                 | 0118                                                      | 0218       | 0318        | 0418         | 2018                       | 3018        | 4018         |  |  |  | T242A825K010(2)S                               |
| 8.2                                              | A            | 20                             | T140A825M010AS       | 1.2                                 | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 47.0                                             | B            | 10                             | T140B476K010AS       | 4.0                                 | 6                                                 | 0119                                                      | 0219       | 0319        | 0419         | 2019                       | 3019        | 4019         |  |  |  | T242B476K010(2)S                               |
| 47.0                                             | B            | 20                             | T140B476M010AS       | 4.0                                 | 6                                                 | 0120                                                      | 0220       | 0320        | 0420         | 2020                       | 3020        | 4020         |  |  |  | T242B476M010(2)S                               |
| 56.0                                             | B            | 10                             | T140B566K010AS       | 5.0                                 | 6                                                 | 0121                                                      | 0221       | 0321        | 0421         | 2021                       | 3021        | 4021         |  |  |  | T242B566K010(2)S                               |
| 56.0                                             | B            | 20                             | T140B566M010AS       | 5.0                                 | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 68.0                                             | B            | 10                             | T140B686K010AS       | 6.0                                 | 6                                                 | 0122                                                      | 0222       | 0322        | 0422         | 2022                       | 3022        | 4022         |  |  |  | T242B686K010(2)S                               |
| 68.0                                             | B            | 20                             | T140B686M010AS       | 6.0                                 | 6                                                 | 0123                                                      | 0223       | 0323        | 0423         | 2023                       | 3023        | 4023         |  |  |  | T242B686M010(2)S                               |
| 82.0                                             | B            | 10                             | T140B826K010AS       | 7.0                                 | 6                                                 | 0124                                                      | 0224       | 0324        | 0424         | 2024                       | 3024        | 4024         |  |  |  | T242B826K010(2)S                               |
| 82.0                                             | B            | 20                             | T140B826M010AS       | 7.0                                 | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 150.0                                            | C            | 10, 20                         | T140C157(1)010AS     | 8.0                                 | 8                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 180.0                                            | C            | 10, 20                         | T140C187(1)010AS     | 8.0                                 | 8                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 220.0                                            | C            | 10                             | T140C227K010AS       | 12.0                                | 8                                                 | 0125                                                      | 0225       | 0325        | 0425         | 2025                       | 3025        | 4025         |  |  |  | T242C227K010(2)S                               |
| 220.0                                            | C            | 20                             | T140C227M010AS       | 12.0                                | 8                                                 | 0126                                                      | 0226       | 0326        | 0426         | 2026                       | 3026        | 4026         |  |  |  | T242C227M010(2)S                               |
| 270.0                                            | C            | 10                             | T140C277K010AS       | 13.0                                | 8                                                 | 0127                                                      | 0227       | 0327        | 0427         | 2027                       | 3027        | 4027         |  |  |  | T242C277K010(2)S                               |
| 270.0                                            | C            | 20                             | T140C277M010AS       | 13.0                                | 8                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 330.0                                            | D            | 10, 20                         | T140D337(1)010AS     | 16.0                                | 8                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 390.0                                            | D            | 10                             | T140D397K010AS       | 16.0                                | 10                                                | 0128                                                      | 0228       | 0328        | 0428         | 2028                       | 3028        | 4028         |  |  |  | T242D397K010(2)S                               |
| 390.0                                            | D            | 20                             | T140D397M010AS       | 16.0                                | 10                                                |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 470.0                                            | D            | 10                             | T140D477K010AS       | 16.0                                | 10                                                | 0129                                                      | 0229       | 0329        | 0429         | 2029                       | 3029        | 4029         |  |  |  | T242D477K010(2)S                               |
| 470.0                                            | D            | 20                             | T140D477M010AS       | 16.0                                | 10                                                | 0130                                                      | 0230       | 0330        | 0430         | 2030                       | 3030        | 4030         |  |  |  | T242D477M010(2)S                               |
| 560.0                                            | D            | 10                             | T140D567K010AS       | 20.0                                | 10                                                | 0131                                                      | 0231       | 0331        | 0431         | 2031                       | 3031        | 4031         |  |  |  | T242D567K010(2)S                               |
| 560.0                                            | D            | 20                             | T140D567M010AS       | 20.0                                | 10                                                |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C |              |                                |                      |                                     |                                                   |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 3.9                                              | A            | 10, 20                         | T140A395(1)015AS     | 1.0                                 | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 4.7                                              | A            | 10                             | T140A475K015AS       | 1.0                                 | 4                                                 | 0132                                                      | 0232       | 0332        | 0432         | 2032                       | 3032        | 4032         |  |  |  | T242A475K015(2)S                               |
| 4.7                                              | A            | 20                             | T140A475M015AS       | 1.0                                 | 4                                                 | 0133                                                      | 0233       | 0333        | 0433         | 2033                       | 3033        | 4033         |  |  |  | T242A475M015(2)S                               |
| 5.6                                              | A            | 10                             | T140A565K015AS       | 1.3                                 | 4                                                 | 0134                                                      | 0234       | 0334        | 0434         | 2034                       | 3034        | 4034         |  |  |  | T242A565K015(2)S                               |
| 5.6                                              | A            | 20                             | T140A565M015AS       | 1.3                                 | 4                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 27.0                                             | B            | 10, 20                         | T140B276(1)015AS     | 3.0                                 | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 33.0                                             | B            | 10                             | T140B336K015AS       | 5.0                                 | 6                                                 | 0135                                                      | 0235       | 0335        | 0435         | 2035                       | 3035        | 4035         |  |  |  | T242B336K015(2)S                               |
| 33.0                                             | B            | 20                             | T140B336M015AS       | 5.0                                 | 6                                                 | 0136                                                      | 0236       | 0336        | 0436         | 2036                       | 3036        | 4036         |  |  |  | T242B336M015(2)S                               |
| 39.0                                             | B            | 10                             | T140B396K015AS       | 5.3                                 | 6                                                 | 0137                                                      | 0237       | 0337        | 0437         | 2037                       | 3037        | 4037         |  |  |  | T242B396K015(2)S                               |
| 39.0                                             | B            | 20                             | T140B396M015AS       | 5.3                                 | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 82.0                                             | C            | 10, 20                         | T140C826(1)015AS     | 8.0                                 | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 100.0                                            | C            | 10, 20                         | T140C107(1)015AS     | 10.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 120.0                                            | C            | 10, 20                         | T140C127(1)015AS     | 10.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 150.0                                            | C            | 10                             | T140C157K015AS       | 15.0                                | 8                                                 | 0138                                                      | 0238       | 0338        | 0438         | 2038                       | 3038        | 4038         |  |  |  | T242C157K015(2)S                               |
| 150.0                                            | C            | 20                             | T140C157M015AS       | 15.0                                | 8                                                 | 0139                                                      | 0239       | 0339        | 0439         | 2039                       | 3039        | 4039         |  |  |  | T242C157M015(2)S                               |
| 180.0                                            | C            | 10                             | T140C187K015AS       | 15.0                                | 8                                                 | 0140                                                      | 0240       | 0340        | 0440         | 2040                       | 3040        | 4040         |  |  |  | T242C187K015(2)S                               |
| 180.0                                            | C            | 20                             | T140C187M015AS       | 15.0                                | 8                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 220.0                                            | D            | 10                             | T140D227K015AS       | 20.0                                | 8                                                 | 0141                                                      | 0241       | 0341        | 0441         | 2041                       | 3041        | 4041         |  |  |  | T242D227K015(2)S                               |
| 220.0                                            | D            | 20                             | T140D227M015AS       | 20.0                                | 8                                                 | 0142                                                      | 0242       | 0342        | 0442         | 2042                       | 3042        | 4042         |  |  |  | T242D227M015(2)S                               |
| 270.0                                            | D            | 10                             | T140D277K015AS       | 20.0                                | 8                                                 | 0143                                                      | 0243       | 0343        | 0443         | 2043                       | 3043        | 4043         |  |  |  | T242D277K015(2)S                               |
| 270.0                                            | D            | 20                             | T140D277M015AS       | 20.0                                | 8                                                 |                                                           |            |             |              |                            |             |              |  |  |  |                                                |
| 330.0                                            | D            | 10                             | T140D337K015AS       | 20.0                                | 8                                                 | 0144                                                      | 0244       | 0344        | 0444         | 2044                       | 3044        | 4044         |  |  |  | T242D337K015(2)S                               |
| 330.0                                            | D            | 20                             | T140D337M015AS       | 20.0                                | 8                                                 | 0145                                                      | 0245       | 0345        | 0445         | 2045                       | 3045        | 4045         |  |  |  | T242D337M015(2)S                               |

(1) To complete T140 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T242 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**RATINGS & PART NUMBER REFERENCE**

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T140           |                                    |                                                   | MIL-PRF-39003 (CSR23) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|--------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                  |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                  |              |                                |                      |                                    |                                                   | MIL-PRF-39003/3F<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/3F<br>GRADED |             |              |                  |                                                |
|                                                  |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.7                                              | A            | 10                             | T140A275K020AS       | 0.8                                | 4                                                 | 0146                                                      | 0246       | 0346        | 0446         | 2046                       | 3046        | 4046         | T242A275K020(2)S |                                                |
| 2.7                                              | A            | 20                             | T140A275M020AS       | 0.8                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 3.3                                              | A            | 10                             | T140A335K020AS       | 1.0                                | 4                                                 | 0147                                                      | 0247       | 0347        | 0447         | 2047                       | 3047        | 4047         | T242A335K020(2)S |                                                |
| 3.3                                              | A            | 20                             | T140A335M020AS       | 1.0                                | 4                                                 | 0148                                                      | 0248       | 0348        | 0448         | 2048                       | 3048        | 4048         | T242A335M020(2)S |                                                |
| 3.9                                              | A            | 10                             | T140A395K020AS       | 1.2                                | 4                                                 | 0149                                                      | 0249       | 0349        | 0449         | 2049                       | 3049        | 4049         | T242A395K020(2)S |                                                |
| 3.9                                              | A            | 20                             | T140A395M020AS       | 1.2                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                             | B            | 10                             | T140B186K020AS       | 3.0                                | 6                                                 | 0150                                                      | 0250       | 0350        | 0450         | 2050                       | 3050        | 4050         | T242B186K020(2)S |                                                |
| 18.0                                             | B            | 20                             | T140B186M020AS       | 3.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 22.0                                             | B            | 10                             | T140B226K020AS       | 3.0                                | 6                                                 | 0151                                                      | 0251       | 0351        | 0451         | 2051                       | 3051        | 4051         | T242B226K020(2)S |                                                |
| 22.0                                             | B            | 20                             | T140B226M020AS       | 3.0                                | 6                                                 | 0152                                                      | 0252       | 0352        | 0452         | 2052                       | 3052        | 4052         | T242B226M020(2)S |                                                |
| 27.0                                             | B            | 10                             | T140B276K020AS       | 4.0                                | 6                                                 | 0153                                                      | 0253       | 0353        | 0453         | 2053                       | 3053        | 4053         | T242B276K020(2)S |                                                |
| 27.0                                             | B            | 20                             | T140B276M020AS       | 4.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 56.0                                             | C            | 10                             | T140C566K020AS       | 7.0                                | 6                                                 | 0154                                                      | 0254       | 0354        | 0454         | 2054                       | 3054        | 4054         | T242C566K020(2)S |                                                |
| 56.0                                             | C            | 20                             | T140C566M020AS       | 7.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 68.0                                             | C            | 10                             | T140C686K020AS       | 8.0                                | 6                                                 | 0155                                                      | 0255       | 0355        | 0455         | 2055                       | 3055        | 4055         | T242C686K020(2)S |                                                |
| 68.0                                             | C            | 20                             | T140C686M020AS       | 8.0                                | 6                                                 | 0156                                                      | 0256       | 0356        | 0456         | 2056                       | 3056        | 4056         | T242C686M020(2)S |                                                |
| 82.0                                             | C            | 10                             | T140C826K020AS       | 10.0                               | 6                                                 | 0157                                                      | 0257       | 0357        | 0457         | 2057                       | 3057        | 4057         | T242C826K020(2)S |                                                |
| 82.0                                             | C            | 20                             | T140C826M020AS       | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 100.0                                            | C            | 10                             | T140C107K020AS       | 12.0                               | 6                                                 | 0158                                                      | 0258       | 0358        | 0458         | 2058                       | 3058        | 4058         | T242C107K020(2)S |                                                |
| 100.0                                            | C            | 20                             | T140C107M020AS       | 12.0                               | 6                                                 | 0159                                                      | 0259       | 0359        | 0459         | 2059                       | 3059        | 4059         | T242C107M020(2)S |                                                |
| 120.0                                            | C            | 10                             | T140C127K020AS       | 12.0                               | 6                                                 | 0160                                                      | 0260       | 0360        | 0460         | 2060                       | 3060        | 4060         | T242C127K020(2)S |                                                |
| 120.0                                            | C            | 20                             | T140C127M020AS       | 12.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 150.0                                            | D            | 10                             | T140D157K020AS       | 15.0                               | 8                                                 | 0161                                                      | 0261       | 0361        | 0461         | 2061                       | 3061        | 4061         | T242D157K020(2)S |                                                |
| 150.0                                            | D            | 20                             | T140D157M020AS       | 15.0                               | 8                                                 | 0162                                                      | 0262       | 0362        | 0462         | 2062                       | 3062        | 4062         | T242D157M020(2)S |                                                |
| 180.0                                            | D            | 10                             | T140D187K020AS       | 15.0                               | 8                                                 | 0163                                                      | 0263       | 0363        | 0463         | 2063                       | 3063        | 4063         | T242D187K020(2)S |                                                |
| 180.0                                            | D            | 20                             | T140D187M020AS       | 15.0                               | 8                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 30 VOLT RATING AT 85°C — 20 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                              | A            | 10, 20                         | T140A125(1)030AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                              | A            | 10, 20                         | T140A155(1)030AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.8                                              | A            | 10, 20                         | T140A185(1)030AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.2                                              | A            | 10, 20                         | T140A225(1)030AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 2.7                                              | A            | 10, 20                         | T140A275(1)030AS     | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 12.0                                             | B            | 10, 20                         | T140B126(1)030AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                             | B            | 10, 20                         | T140B156(1)030AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                             | B            | 10, 20                         | T140B186(1)030AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 33.0                                             | C            | 10, 20                         | T140C336(1)030AS     | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 39.0                                             | C            | 10, 20                         | T140C396(1)030AS     | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 47.0                                             | C            | 10, 20                         | T140C476(1)030AS     | 7.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 56.0                                             | C            | 10, 20                         | T140C566(1)030AS     | 7.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 68.0                                             | C            | 10, 20                         | T140C686(1)030AS     | 7.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 82.0                                             | D            | 10, 20                         | T140D826(1)030AS     | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 100.0                                            | D            | 10, 20                         | T140D107(1)030AS     | 10.0                               | 8                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |

(1) To complete T140 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T242 Series Part Number, insert Failure Rate Symbol in the 13th Character.

**Bold Face** lines indicate popular part types and values.

**T140/T242 Series Tantalum  
Hermetically Sealed**



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003

## T140 SERIES — POLAR TYPE & T242 (CSR23)

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T140           |                                    |                                                   | MIL-PRF-39003 (CSR23) CAPACITORS                          |            |             |              |                            |             |              |                  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|--------------------------------------------------|--------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|------------------------------------------------|
|                                                  |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |                                                |
|                                                  |              |                                |                      |                                    |                                                   | MIL-PRF-39003/3F<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/3F<br>GRADED |             |              |                  |                                                |
|                                                  |              |                                |                      |                                    |                                                   | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |                                                |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                              | A            | 10, 20                         | T140A125(1)035AS     | 0.6                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                              | A            | 10, 20                         | T140A155(1)035AS     | 0.8                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.8                                              | A            | 10                             | T140A185K035AS       | 1.0                                | 4                                                 | 0164                                                      | 0264       | 0364        | 0464         | 2064                       | 3064        | 4064         | T242A185K035(2)S |                                                |
| 1.8                                              | A            | 20                             | T140A185M035AS       | 1.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 8.2                                              | B            | 10                             | T140B825K035AS       | 3.0                                | 4                                                 | 0165                                                      | 0265       | 0365        | 0465         | 2065                       | 3065        | 4065         | T242B825K035(2)S |                                                |
| 8.2                                              | B            | 20                             | T140B825M035AS       | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 10.0                                             | B            | 10                             | T140B106K035AS       | 3.0                                | 4                                                 | 0166                                                      | 0266       | 0366        | 0466         | 2066                       | 3066        | 4066         | T242B106K035(2)S |                                                |
| 10.0                                             | B            | 20                             | T140B106M035AS       | 3.0                                | 4                                                 | 0167                                                      | 0267       | 0367        | 0467         | 2067                       | 3067        | 4067         | T242B106M035(2)S |                                                |
| 27.0                                             | C            | 10, 20                         | T140C276(1)035AS     | 7.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 33.0                                             | C            | 10                             | T140C336K035AS       | 8.0                                | 6                                                 | 0168                                                      | 0268       | 0368        | 0468         | 2068                       | 3068        | 4068         | T242C336K035(2)S |                                                |
| 33.0                                             | C            | 20                             | T140C336M035AS       | 8.0                                | 6                                                 | 0169                                                      | 0269       | 0369        | 0469         | 2069                       | 3069        | 4069         | T242C336M035(2)S |                                                |
| 39.0                                             | C            | 10                             | T140C396K035AS       | 10.0                               | 6                                                 | 0170                                                      | 0270       | 0370        | 0470         | 2070                       | 3070        | 4070         | T242C396K035(2)S |                                                |
| 39.0                                             | C            | 20                             | T140C396M035AS       | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 47.0                                             | C            | 10                             | T140C476K035AS       | 10.0                               | 6                                                 | 0171                                                      | 0271       | 0371        | 0471         | 2071                       | 3071        | 4071         | T242C476K035(2)S |                                                |
| 47.0                                             | C            | 20                             | T140C476M035AS       | 10.0                               | 6                                                 | 0172                                                      | 0272       | 0372        | 0472         | 2072                       | 3072        | 4072         | T242C476M035(2)S |                                                |
| 56.0                                             | D            | 10                             | T140D566K035AS       | 12.0                               | 6                                                 | 0173                                                      | 0273       | 0373        | 0473         | 2073                       | 3073        | 4073         | T242D566K035(2)S |                                                |
| 56.0                                             | D            | 20                             | T140D566M035AS       | 12.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 68.0                                             | D            | 10                             | T140D686K035AS       | 12.0                               | 6                                                 | 0174                                                      | 0274       | 0374        | 0474         | 2074                       | 3074        | 4074         | T242D686K035(2)S |                                                |
| 68.0                                             | D            | 20                             | T140D686M035AS       | 12.0                               | 6                                                 | 0175                                                      | 0275       | 0375        | 0475         | 2075                       | 3075        | 4075         | T242D686M035(2)S |                                                |
| 82.0                                             | D            | 10, 20                         | T140D826(1)035AS     | 20.0                               | 8                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 100.0                                            | D            | 10, 20                         | T140D107(1)035AS     | 20.0                               | 8                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.2                                              | A            | 10                             | T140A125K050AS       | 0.6                                | 4                                                 | 0176                                                      | 0276       | 0376        | 0476         | 2076                       | 3076        | 4076         | T242A125K050(2)S |                                                |
| 1.2                                              | A            | 20                             | T140A125M050AS       | 0.6                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.5                                              | A            | 10                             | T140A155K050AS       | 0.8                                | 4                                                 | 0177                                                      | 0277       | 0377        | 0477         | 2077                       | 3077        | 4077         | T242A155K050(2)S |                                                |
| 1.5                                              | A            | 20                             | T140A155M050AS       | 0.8                                | 4                                                 | 0178                                                      | 0278       | 0378        | 0478         | 2078                       | 3078        | 4078         | T242A155M050(2)S |                                                |
| 5.6                                              | B            | 10                             | T140B565K050AS       | 2.5                                | 4                                                 | 0179                                                      | 0279       | 0379        | 0479         | 2079                       | 3079        | 4079         | T242B565K050(2)S |                                                |
| 5.6                                              | B            | 20                             | T140B565M050AS       | 2.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 6.8                                              | B            | 10                             | T140B685K050AS       | 2.5                                | 4                                                 | 0180                                                      | 0280       | 0380        | 0480         | 2080                       | 3080        | 4080         | T242B685K050(2)S |                                                |
| 6.8                                              | B            | 20                             | T140B685M050AS       | 2.5                                | 4                                                 | 0181                                                      | 0281       | 0381        | 0481         | 2081                       | 3081        | 4081         | T242B685M050(2)S |                                                |
| 22.0                                             | C            | 10                             | T140C226K050AS       | 7.0                                | 6                                                 | 0182                                                      | 0282       | 0382        | 0482         | 2082                       | 3082        | 4082         | T242C226K050(2)S |                                                |
| 22.0                                             | C            | 20                             | T140C226M050AS       | 7.0                                | 6                                                 | 0183                                                      | 0283       | 0383        | 0483         | 2083                       | 3083        | 4083         | T242C226M050(2)S |                                                |
| 27.0                                             | C            | 10                             | T140C276K050AS       | 8.0                                | 6                                                 | 0184                                                      | 0284       | 0384        | 0484         | 2084                       | 3084        | 4084         | T242C276K050(2)S |                                                |
| 27.0                                             | C            | 20                             | T140C276M050AS       | 8.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 33.0                                             | D            | 10                             | T140D336K050AS       | 10.0                               | 6                                                 | 0185                                                      | 0285       | 0385        | 0485         | 2085                       | *           | *            | T242D336K050(2)S |                                                |
| 33.0                                             | D            | 20                             | T140D336M050AS       | 10.0                               | 6                                                 | 0186                                                      | 0286       | 0386        | 0486         | 2086                       | *           | *            | T242D336M050(2)S |                                                |
| 39.0                                             | D            | 10                             | T140D396K050AS       | 10.0                               | 6                                                 | 0187                                                      | 0287       | 0387        | 0487         | 2087                       | *           | *            | T242D396K050(2)S |                                                |
| 39.0                                             | D            | 20                             | T140D396M050AS       | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 47.0                                             | D            | 20                             | T140D476M050AS       | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 60 VOLT RATING AT 85°C — 40 VOLT RATING AT 125°C |              |                                |                      |                                    |                                                   |                                                           |            |             |              |                            |             |              |                  |                                                |
| 0.82                                             | A            | 10, 20                         | T140A824(1)060AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 1.0                                              | A            | 10, 20                         | T140A105(1)060AS     | 0.5                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 4.7                                              | B            | 10, 20                         | T140B475(1)060AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 5.6                                              | B            | 10, 20                         | T140B565(1)060AS     | 3.0                                | 4                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 15.0                                             | C            | 10, 20                         | T140C156(1)060AS     | 5.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 18.0                                             | C            | 10, 20                         | T140C186(1)060AS     | 6.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 22.0                                             | C            | 10, 20                         | T140C226(1)060AS     | 7.0                                | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 27.0                                             | D            | 10, 20                         | T140D276(1)060AS     | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |
| 33.0                                             | D            | 10, 20                         | T140D336(1)060AS     | 10.0                               | 6                                                 |                                                           |            |             |              |                            |             |              |                  |                                                |

(1) To complete T140 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T242 Series Part Number, insert Failure Rate Symbol in the 13th Character.

\*Note: C Failure Rate not QPL for -3085 thru 3087

D Failure Rate not QPL for -4085 thru 4087

**Bold Face** lines indicate popular part types and values.

Available from 1.2  $\mu$ F to 1000  $\mu$ F, 6VDC to 50 VDC, these high capacitance-to-volume ratio, hermetically sealed solid tantalum capacitors are offered in standard MIL style A, B, C, and D cases. They meet or exceed the environmental and mechanical requirements of MIL-C-39003. Designed to operate from -55°C to +125°C, they exhibit

exceptionally low DC leakage, dissipation factor and impedance characteristics. They are ideal for coupling, bypass, filtering and timing circuits, and are excellent substitutes for wet tantalums in low voltage applications. They are available in style CSR33 (T252 Series) per MIL-PRF-39003/06.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | UNINSULATED                       |                                   | INSULATED                         |                                   | B<br>$\pm 0.002$<br>( $\pm .05$ ) | C<br>MAX.     |
|-----------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------|
|           | D<br>$\pm 0.005$<br>( $\pm .13$ ) | L<br>$\pm 0.031$<br>( $\pm .79$ ) | D<br>$\pm 0.010$<br>( $\pm .25$ ) | L<br>$\pm 0.031$<br>( $\pm .79$ ) |                                   |               |
| A         | 0.125 (3.18)                      | 0.250 (6.35)                      | 0.135 (3.43)                      | 0.286 (7.26)                      | 0.020 (.51)                       | 0.422 (10.72) |
| B         | 0.175 (4.45)                      | 0.438 (11.13)                     | 0.185 (4.70)                      | 0.474 (12.04)                     | 0.020 (.51)                       | 0.610 (15.49) |
| C         | 0.279 (7.09)                      | 0.650 (16.51)                     | 0.289 (7.34)                      | 0.686 (17.42)                     | 0.025 (.64)                       | 0.822 (20.88) |
| D         | 0.341 (8.66)                      | 0.750 (19.05)                     | 0.351 (8.92)                      | 0.786 (19.96)                     | 0.025 (.64)                       | 0.922 (23.42) |

### ORDERING INFORMATION

**TANTALUM** — T

**SERIES** — 252  
252 — CSR33

**CASE SIZE** — A / B / C / D

**PICOFARAD CODE** — 125  
First two digits represent significant figures.  
3rd digit specifies no. of zeros to follow.

**CAP. TOLERANCE** — K  
M —  $\pm 20\%$   
K —  $\pm 10\%$   
J —  $\pm 5\%$

**SPECIFICATION** — C\*  
All capacitors are sleeved unless specified.

**LEAD MATERIAL** — S  
S — Standard

**FAILURE RATE\*\* GRADED** — M  
B — 0.1%/k hrs.  
C — 0.01%/k hrs.  
D — 0.001%/k hrs.

**EXPONENTIAL** — S  
M — 1%/k hrs.  
P — 0.1%/k hrs.  
R — 0.01%/k hrs.  
S — 0.001%/k hrs.

**VOLTAGE RATING** — 050  
At 85°C

**\*Part Number Example: T252A125K050MS (14 digits - no spaces)**

For Military Marking Information, see page 4.



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003 T252 (CSR33) SERIES

## RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF      | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T252 SERIES                  |                                                        |                                                           |            |             |              | MIL-PRF-39003 (CSR33) CAPACITORS |             |              |                                                |  |
|------------------------|--------------|--------------------------------|------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------------|-------------|--------------|------------------------------------------------|--|
|                        |              |                                | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              | MIL-PRF-39003/6C<br>GRADED       |             |              | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |  |
|                        |              |                                |                                    |                                                        | MIL-PRF-39003/6C<br>EXPONENTIAL                           |            |             |              |                                  |             |              |                                                |  |
|                        |              |                                |                                    |                                                        | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                       | C<br>(0.01) | D<br>(0.001) |                                                |  |
| 6 VOLT RATING AT 85°C  |              |                                |                                    |                                                        |                                                           |            |             |              |                                  |             |              |                                                |  |
| 10.0                   | A            | 10                             | 0.5                                | 6                                                      | 0001                                                      | 0101       | 0201        | 0301         | 2001                             | 3001        | 4001         | T252A106K006(1)S                               |  |
| 10.0                   | A            | 20                             | 0.5                                | 6                                                      | 0002                                                      | 0102       | 0202        | 0302         | 2002                             | 3002        | 4002         | T252A106M006(1)S                               |  |
| 12.0                   | A            | 10                             | 0.5                                | 6                                                      | 0003                                                      | 0103       | 0203        | 0303         | 2003                             | 3003        | 4003         | T252A126K006(1)S                               |  |
| 100.0                  | B            | 10                             | 1.0                                | 8                                                      | 0004                                                      | 0104       | 0204        | 0304         | 2004                             | 3004        | 4004         | T252B107K006(1)S                               |  |
| 100.0                  | B            | 20                             | 1.0                                | 8                                                      | 0005                                                      | 0105       | 0205        | 0305         | 2005                             | 3005        | 4005         | T252B107M006(1)S                               |  |
| 330.0                  | C            | 10                             | 2.0                                | 8                                                      | 0006                                                      | 0106       | 0206        | 0306         | 2006                             | 3006        | 4006         | T252C337K006(1)S                               |  |
| 330.0                  | C            | 20                             | 2.0                                | 8                                                      | 0007                                                      | 0107       | 0207        | 0307         | 2007                             | 3007        | 4007         | T252C337M006(1)S                               |  |
| 390.0                  | C            | 10                             | 2.0                                | 10                                                     | 0008                                                      | 0108       | 0208        | 0308         | 2008                             | 3008        | 4008         | T252C397K006(1)S                               |  |
| 470.0                  | C            | 10                             | 2.0                                | 10                                                     | 0009                                                      | 0109       | 0209        | 0309         | 2009                             | 3009        | 4009         | T252C477K006(1)S                               |  |
| 470.0                  | C            | 20                             | 2.0                                | 10                                                     | 0010                                                      | 0110       | 0210        | 0310         | 2010                             | 3010        | 4010         | T252C477M006(1)S                               |  |
| 680.0                  | D            | 10                             | 5.0                                | 10                                                     | 0011                                                      | 0111       | 0211        | 0311         | 2011                             | 3011        | 4011         | T252D687K006(1)S                               |  |
| 680.0                  | D            | 20                             | 5.0                                | 10                                                     | 0012                                                      | 0112       | 0212        | 0312         | 2012                             | 3012        | 4012         | T252D687M006(1)S                               |  |
| 820.0                  | D            | 10                             | 5.0                                | 10                                                     | 0013                                                      | 0113       | 0213        | 0313         | 2013                             | 3013        | 4013         | T252D827K006(1)S                               |  |
| 1000.0                 | D            | 10                             | 5.0                                | 10                                                     | 0014                                                      | 0114       | 0214        | 0314         | 2014                             | 3014        | 4014         | T252D108K006(1)S                               |  |
| 1000.0                 | D            | 20                             | 5.0                                | 10                                                     | 0015                                                      | 0115       | 0215        | 0315         | 2015                             | 3015        | 4015         | T252D108M006(1)S                               |  |
| 10 VOLT RATING AT 85°C |              |                                |                                    |                                                        |                                                           |            |             |              |                                  |             |              |                                                |  |
| 6.8                    | A            | 10                             | .5                                 | 6                                                      | 0016                                                      | 0116       | 0216        | 0316         | 2016                             | 3016        | 4016         | T252A685K010(1)S                               |  |
| 6.8                    | A            | 20                             | .5                                 | 6                                                      | 0017                                                      | 0117       | 0217        | 0317         | 2017                             | 3017        | 4017         | T252A685M010(1)S                               |  |
| 8.2                    | A            | 10                             | .5                                 | 6                                                      | 0018                                                      | 0118       | 0218        | 0318         | 2018                             | 3018        | 4018         | T252A825K010(1)S                               |  |
| 47.0                   | B            | 10                             | 1.0                                | 6                                                      | 0019                                                      | 0119       | 0219        | 0319         | 2019                             | 3019        | 4019         | T252B476K010(1)S                               |  |
| 47.0                   | B            | 20                             | 1.0                                | 6                                                      | 0020                                                      | 0120       | 0220        | 0320         | 2020                             | 3020        | 4020         | T252B476M010(1)S                               |  |
| 56.0                   | B            | 10                             | 1.0                                | 6                                                      | 0021                                                      | 0121       | 0221        | 0321         | 2021                             | 3021        | 4021         | T252B566K010(1)S                               |  |
| 68.0                   | B            | 10                             | 1.0                                | 6                                                      | 0022                                                      | 0122       | 0222        | 0322         | 2022                             | 3022        | 4022         | T252B686K010(1)S                               |  |
| 68.0                   | B            | 20                             | 1.0                                | 6                                                      | 0023                                                      | 0123       | 0223        | 0323         | 2023                             | 3023        | 4023         | T252B686M010(1)S                               |  |
| 82.0                   | B            | 10                             | 1.0                                | 6                                                      | 0024                                                      | 0124       | 0224        | 0324         | 2024                             | 3024        | 4024         | T252B826K010(1)S                               |  |
| 220.0                  | C            | 10                             | 1.0                                | 8                                                      | 0025                                                      | 0125       | 0225        | 0325         | 2025                             | 3025        | 4025         | T252C227K010(1)S                               |  |
| 220.0                  | C            | 20                             | 1.0                                | 8                                                      | 0026                                                      | 0126       | 0226        | 0326         | 2026                             | 3026        | 4026         | T252C227M010(1)S                               |  |
| 270.0                  | C            | 10                             | 2.0                                | 8                                                      | 0027                                                      | 0127       | 0227        | 0327         | 2027                             | 3027        | 4027         | T252C277K010(1)S                               |  |
| 390.0                  | D            | 10                             | 2.0                                | 10                                                     | 0028                                                      | 0128       | 0228        | 0328         | 2028                             | 3028        | 4028         | T252D397K010(1)S                               |  |
| 470.0                  | D            | 10                             | 4.0                                | 10                                                     | 0029                                                      | 0129       | 0229        | 0329         | 2029                             | 3029        | 4029         | T252D477K010(1)S                               |  |
| 470.0                  | D            | 20                             | 4.0                                | 10                                                     | 0030                                                      | 0130       | 0230        | 0330         | 2030                             | 3030        | 4030         | T252D477M010(1)S                               |  |
| 560.0                  | D            | 10                             | 4.0                                | 10                                                     | 0031                                                      | 0131       | 0231        | 0331         | 2031                             | 3031        | 4031         | T252D567K010(1)S                               |  |
| 15 VOLT RATING AT 85°C |              |                                |                                    |                                                        |                                                           |            |             |              |                                  |             |              |                                                |  |
| 4.7                    | A            | 10                             | .5                                 | 4                                                      | 0032                                                      | 0132       | 0232        | 0332         | 2032                             | 3032        | 4032         | T252A475K015(1)S                               |  |
| 4.7                    | A            | 20                             | .5                                 | 4                                                      | 0033                                                      | 0133       | 0233        | 0333         | 2033                             | 3033        | 4033         | T252A475M015(1)S                               |  |
| 5.6                    | A            | 10                             | .5                                 | 4                                                      | 0034                                                      | 0134       | 0234        | 0334         | 2034                             | 3034        | 4034         | T252A565K015(1)S                               |  |
| 33.0                   | B            | 10                             | 1.0                                | 6                                                      | 0035                                                      | 0135       | 0235        | 0335         | 2035                             | 3035        | 4035         | T252B336K015(1)S                               |  |
| 33.0                   | B            | 20                             | 1.0                                | 6                                                      | 0036                                                      | 0136       | 0236        | 0336         | 2036                             | 3036        | 4036         | T252B336M015(1)S                               |  |
| 39.0                   | B            | 10                             | 1.0                                | 6                                                      | 0037                                                      | 0137       | 0237        | 0337         | 2037                             | 3037        | 4037         | T252B396K015(1)S                               |  |
| 150.0                  | C            | 10                             | 1.0                                | 8                                                      | 0038                                                      | 0138       | 0238        | 0338         | 2038                             | 3038        | 4038         | T252C157K015(1)S                               |  |
| 150.0                  | C            | 20                             | 1.0                                | 8                                                      | 0039                                                      | 0139       | 0239        | 0339         | 2039                             | 3039        | 4039         | T252C157M015(1)S                               |  |
| 180.0                  | C            | 10                             | 2.0                                | 8                                                      | 0040                                                      | 0140       | 0240        | 0340         | 2040                             | 3040        | 4040         | T252C187K015(1)S                               |  |
| 220.0                  | D            | 10                             | 2.0                                | 8                                                      | 0041                                                      | 0141       | 0241        | 0341         | 2041                             | 3041        | 4041         | T252D227K015(1)S                               |  |
| 220.0                  | D            | 20                             | 2.0                                | 8                                                      | 0042                                                      | 0142       | 0242        | 0342         | 2042                             | 3042        | 4042         | T252D227M015(1)S                               |  |
| 270.0                  | D            | 10                             | 2.0                                | 8                                                      | 0043                                                      | 0143       | 0243        | 0343         | 2043                             | 3043        | 4043         | T252D277K015(1)S                               |  |
| 330.0                  | D            | 10                             | 2.0                                | 8                                                      | 0044                                                      | 0144       | 0244        | 0344         | 2044                             | 3044        | 4044         | T252D337K015(1)S                               |  |
| 330.0                  | D            | 20                             | 2.0                                | 8                                                      | 0045                                                      | 0145       | 0245        | 0345         | 2045                             | 3045        | 4045         | T252D337M015(1)S                               |  |

(1) To complete Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 31.

**RATINGS & PART NUMBER REFERENCE**

| CAPACITANCE<br>μF      | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T252 SERIES                  |                                                        |                                                           |            |             |              | MIL-PRF-39003 (CSR33) CAPACITORS |             |              |                  |  |                                                |
|------------------------|--------------|--------------------------------|------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------------|-------------|--------------|------------------|--|------------------------------------------------|
|                        |              |                                | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>120Hz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                                  |             |              |                  |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|                        |              |                                |                                    |                                                        | MIL-PRF-39003/6C<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/6C<br>GRADED       |             |              |                  |  |                                                |
|                        |              |                                |                                    |                                                        | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                       | C<br>(0.01) | D<br>(0.001) |                  |  |                                                |
| 20 VOLT RATING AT 85°C |              |                                |                                    |                                                        |                                                           |            |             |              |                                  |             |              |                  |  |                                                |
| 2.7                    | A            | 10                             | .5                                 | 4                                                      | 0046                                                      | 0146       | 0246        | 0346         | 2046                             | 3046        | 4046         | T252A275K020(1)S |  |                                                |
| 3.3                    | A            | 10                             | .5                                 | 4                                                      | 0047                                                      | 0147       | 0247        | 0347         | 2047                             | 3047        | 4047         | T252A335K020(1)S |  |                                                |
| 3.3                    | A            | 20                             | .5                                 | 4                                                      | 0048                                                      | 0148       | 0248        | 0348         | 2048                             | 3048        | 4048         | T252A335M020(1)S |  |                                                |
| 3.9                    | A            | 10                             | .5                                 | 4                                                      | 0049                                                      | 0149       | 0249        | 0349         | 2049                             | 3049        | 4049         | T252A395K020(1)S |  |                                                |
| 18.0                   | B            | 10                             | 1.0                                | 6                                                      | 0050                                                      | 0150       | 0250        | 0350         | 2050                             | 3050        | 4050         | T252B186K020(1)S |  |                                                |
| 22.0                   | B            | 10                             | 1.0                                | 6                                                      | 0051                                                      | 0151       | 0251        | 0351         | 2051                             | 3051        | 4051         | T252B226K020(1)S |  |                                                |
| 22.0                   | B            | 20                             | 1.0                                | 6                                                      | 0052                                                      | 0152       | 0252        | 0352         | 2052                             | 3052        | 4052         | T252B226M020(1)S |  |                                                |
| 27.0                   | B            | 10                             | 1.0                                | 6                                                      | 0053                                                      | 0153       | 0253        | 0353         | 2053                             | 3053        | 4053         | T252B276K020(1)S |  |                                                |
| 56.0                   | C            | 10                             | 1.0                                | 6                                                      | 0054                                                      | 0154       | 0254        | 0354         | 2054                             | 3054        | 4054         | T252C566K020(1)S |  |                                                |
| 68.0                   | C            | 10                             | 1.0                                | 6                                                      | 0055                                                      | 0155       | 0255        | 0355         | 2055                             | 3055        | 4055         | T252C686K020(1)S |  |                                                |
| 68.0                   | C            | 20                             | 1.0                                | 6                                                      | 0056                                                      | 0156       | 0256        | 0356         | 2056                             | 3056        | 4056         | T252C686M020(1)S |  |                                                |
| 82.0                   | C            | 10                             | 1.0                                | 6                                                      | 0057                                                      | 0157       | 0257        | 0357         | 2057                             | 3057        | 4057         | T252C826K020(1)S |  |                                                |
| 100.0                  | C            | 10                             | 1.0                                | 6                                                      | 0058                                                      | 0158       | 0258        | 0358         | 2058                             | 3058        | 4058         | T252C107K020(1)S |  |                                                |
| 100.0                  | C            | 20                             | 1.0                                | 6                                                      | 0059                                                      | 0159       | 0259        | 0359         | 2059                             | 3059        | 4059         | T252C107M020(1)S |  |                                                |
| 120.0                  | C            | 10                             | 1.0                                | 6                                                      | 0060                                                      | 0160       | 0260        | 0360         | 2060                             | 3060        | 4060         | T252C127K020(1)S |  |                                                |
| 150.0                  | D            | 10                             | 2.0                                | 8                                                      | 0061                                                      | 0161       | 0261        | 0361         | 2061                             | 3061        | 4061         | T252D157K020(1)S |  |                                                |
| 150.0                  | D            | 20                             | 2.0                                | 8                                                      | 0062                                                      | 0162       | 0262        | 0362         | 2062                             | 3062        | 4062         | T252D157M020(1)S |  |                                                |
| 180.0                  | D            | 10                             | 2.0                                | 8                                                      | 0063                                                      | 0163       | 0263        | 0363         | 2063                             | 3063        | 4063         | T252D187K020(1)S |  |                                                |
| 35 VOLT RATING AT 85°C |              |                                |                                    |                                                        |                                                           |            |             |              |                                  |             |              |                  |  |                                                |
| 1.8                    | A            | 10                             | .5                                 | 4                                                      | 0064                                                      | 0164       | 0264        | 0364         | 2064                             | 3064        | 4064         | T252A185K035(1)S |  |                                                |
| 8.2                    | B            | 10                             | 1.0                                | 6                                                      | 0065                                                      | 0165       | 0265        | 0365         | 2065                             | 3065        | 4065         | T252B825K035(1)S |  |                                                |
| 10.0                   | B            | 10                             | 1.0                                | 6                                                      | 0066                                                      | 0166       | 0266        | 0366         | 2066                             | 3066        | 4066         | T252B106K035(1)S |  |                                                |
| 10.0                   | B            | 20                             | 1.0                                | 6                                                      | 0067                                                      | 0167       | 0267        | 0367         | 2067                             | 3067        | 4067         | T252B106M035(1)S |  |                                                |
| 33.0                   | C            | 10                             | 1.0                                | 6                                                      | 0068                                                      | 0168       | 0268        | 0368         | 2068                             | 3068        | 4068         | T252C336K035(1)S |  |                                                |
| 33.0                   | C            | 20                             | 1.0                                | 6                                                      | 0069                                                      | 0169       | 0269        | 0369         | 2069                             | 3069        | 4069         | T252C336M035(1)S |  |                                                |
| 39.0                   | C            | 10                             | 1.0                                | 6                                                      | 0070                                                      | 0170       | 0270        | 0370         | 2070                             | 3070        | 4070         | T252C396K035(1)S |  |                                                |
| 47.0                   | C            | 10                             | 1.0                                | 6                                                      | 0071                                                      | 0171       | 0271        | 0371         | 2071                             | 3071        | 4071         | T252C476K035(1)S |  |                                                |
| 47.0                   | C            | 20                             | 1.0                                | 6                                                      | 0072                                                      | 0172       | 0272        | 0372         | 2072                             | 3072        | 4072         | T252C476M035(1)S |  |                                                |
| 56.0                   | D            | 10                             | 2.0                                | 6                                                      | 0073                                                      | 0173       | 0273        | 0373         | 2073                             | 3073        | 4073         | T252D566K035(1)S |  |                                                |
| 68.0                   | D            | 10                             | 2.0                                | 6                                                      | 0074                                                      | 0174       | 0274        | 0374         | 2074                             | 3074        | 4074         | T252D686K035(1)S |  |                                                |
| 68.0                   | D            | 20                             | 2.0                                | 6                                                      | 0075                                                      | 0175       | 0275        | 0375         | 2075                             | 3075        | 4075         | T252D686M035(1)S |  |                                                |
| 50 VOLT RATING AT 85°C |              |                                |                                    |                                                        |                                                           |            |             |              |                                  |             |              |                  |  |                                                |
| 1.2                    | A            | 10                             | .5                                 | 4                                                      | 0076                                                      | 0176       | 0276        | 0376         | 2076                             | 3076        | 4076         | T252A125K050(1)S |  |                                                |
| 1.5                    | A            | 10                             | .5                                 | 4                                                      | 0077                                                      | 0177       | 0277        | 0377         | 2077                             | 3077        | 4077         | T252A155K050(1)S |  |                                                |
| 1.5                    | A            | 20                             | .5                                 | 4                                                      | 0078                                                      | 0178       | 0278        | 0378         | 2078                             | 3078        | 4078         | T252A155M050(1)S |  |                                                |
| 5.6                    | B            | 10                             | 1.0                                | 4                                                      | 0079                                                      | 0179       | 0279        | 0379         | 2079                             | 3079        | 4079         | T252B565K050(1)S |  |                                                |
| 6.8                    | B            | 10                             | 1.0                                | 6                                                      | 0080                                                      | 0180       | 0280        | 0380         | 2080                             | 3080        | 4080         | T252B685K050(1)S |  |                                                |
| 6.8                    | B            | 20                             | 1.0                                | 6                                                      | 0081                                                      | 0181       | 0281        | 0381         | 2081                             | 3081        | 4081         | T252B685M050(1)S |  |                                                |
| 22.0                   | C            | 10                             | 1.0                                | 6                                                      | 0082                                                      | 0182       | 0282        | 0382         | 2082                             | 3082        | 4082         | T252C226K050(1)S |  |                                                |
| 22.0                   | C            | 20                             | 1.0                                | 6                                                      | 0083                                                      | 0183       | 0283        | 0383         | 2083                             | 3083        | 4083         | T252C226M050(1)S |  |                                                |
| 27.0                   | C            | 10                             | 1.0                                | 6                                                      | 0084                                                      | 0184       | 0284        | 0384         | 2084                             | 3084        | 4084         | T252C276K050(1)S |  |                                                |
| 33.0                   | D            | 10                             | 1.0                                | 6                                                      | 0085                                                      | 0185       | 0285        | 0385         | 2085                             | *           | *            | T252D336K050(1)S |  |                                                |
| 33.0                   | D            | 20                             | 1.0                                | 6                                                      | 0086                                                      | 0186       | 0286        | 0386         | 2086                             | *           | *            | T252D336M050(1)S |  |                                                |
| 39.0                   | D            | 10                             | 1.0                                | 6                                                      | 0087                                                      | 0187       | 0287        | 0387         | 2087                             | *           | *            | T252D396K050(1)S |  |                                                |

(1) To complete Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 31.

\*NOTE: C Failure rate not QPL for -3085 thru 3087.

D Failure rate not QPL for -4085 thru 4087.

KEMET's T262 (CSR21) per MIL-C-39003/09 hermetically sealed solid tantalum capacitors are similar to KEMET's popular T212 (CSR13 per MIL-PRF-39003/01) capacitors shown on page 6, but offer higher ripple current handling capability and exhibit exceptionally low Equivalent Series Resistance (ESR).

The T262 Series is ideal for filtering applications and in military power supplies where low ESR is essential. T262s are 100% surge current tested and their dissipation factor is screened at 1kHz. Available in C & D case sizes only, 5.6 to 330  $\mu$ F, 6 to 50 VDC.

## CAPACITOR OUTLINE DRAWINGS



## DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | UNINSULATED                       |                                   | INSULATED                         |                                   | B<br>$\pm 0.002$<br>( $\pm .05$ ) | C<br>MAX.     |
|-----------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------|
|           | D<br>$\pm 0.005$<br>( $\pm .13$ ) | L<br>$\pm 0.031$<br>( $\pm .79$ ) | D<br>$\pm 0.010$<br>( $\pm .25$ ) | L<br>$\pm 0.031$<br>( $\pm .79$ ) |                                   |               |
| C         | 0.279 (7.09)                      | 0.650 (16.51)                     | 0.289 (7.34)                      | 0.686 (17.42)                     | 0.025 (.64)                       | 0.822 (20.88) |
| D         | 0.341 (8.66)                      | 0.750 (19.05)                     | 0.351 (8.92)                      | 0.786 (19.96)                     | 0.025 (.64)                       | 0.922 (23.42) |

## ORDERING INFORMATION



For Military Marking Information, see page 4.

**RATINGS & PART NUMBER REFERENCE**

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T262 SERIES                  |                                                        |                                |                                               | MIL-PRF-39003/09 (CSR21) CAPACITORS                       |            |             |              |                            |             |              |                  |  |  | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|--------------------------------------------------|--------------|--------------------------------|------------------------------------|--------------------------------------------------------|--------------------------------|-----------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------|--|--|------------------------------------------------|
|                                                  |              |                                | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>1 kHz | MAX. ESR<br>Ω@25°C,<br>100 kHz | MAX. RIPPLE<br>CURRENT<br>Arms@25°C<br>40 kHz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              |                  |  |  |                                                |
|                                                  |              |                                |                                    |                                                        |                                |                                               | MIL-PRF-39003/9D<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/9D<br>GRADED |             |              |                  |  |  |                                                |
|                                                  |              |                                |                                    |                                                        |                                |                                               | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                  |  |  |                                                |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C   |              |                                |                                    |                                                        |                                |                                               |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 150.0                                            | C            | 5                              | 4.5                                | 10                                                     | .065                           | 3.3                                           | 0001                                                      | 0101       | 0201        | 0301         | 2001                       | 3001        | 4001         | T262C157J006(1)S |  |  |                                                |
| 150.0                                            | C            | 10                             | 4.5                                | 10                                                     | .065                           | 3.3                                           | 0002                                                      | 0102       | 0202        | 0302         | 2002                       | 3002        | 4002         | T262C157K006(1)S |  |  |                                                |
| 150.0                                            | C            | 20                             | 4.5                                | 10                                                     | .065                           | 3.3                                           | 0003                                                      | 0103       | 0203        | 0303         | 2003                       | 3003        | 4003         | T262C157M006(1)S |  |  |                                                |
| 180.0                                            | C            | 5                              | 5.5                                | 10                                                     | .060                           | 3.4                                           | 0004                                                      | 0104       | 0204        | 0304         | 2004                       | 3004        | 4004         | T262C187J006(1)S |  |  |                                                |
| 180.0                                            | C            | 10                             | 5.5                                | 10                                                     | .060                           | 3.4                                           | 0005                                                      | 0105       | 0205        | 0305         | 2005                       | 3005        | 4005         | T262C187K006(1)S |  |  |                                                |
| 270.0                                            | D            | 5                              | 6.5                                | 10                                                     | .050                           | 4.1                                           | 0006                                                      | 0106       | 0206        | 0306         | 2006                       | 3006        | 4006         | T262D277J006(1)S |  |  |                                                |
| 270.0                                            | D            | 10                             | 6.5                                | 10                                                     | .050                           | 4.1                                           | 0007                                                      | 0107       | 0207        | 0307         | 2007                       | 3007        | 4007         | T262D277K006(1)S |  |  |                                                |
| 330.0                                            | D            | 5                              | 7.5                                | 12                                                     | .045                           | 4.3                                           | 0008                                                      | 0108       | 0208        | 0308         | 2008                       | 3008        | 4008         | T262D337J006(1)S |  |  |                                                |
| 330.0                                            | D            | 10                             | 7.5                                | 12                                                     | .045                           | 4.3                                           | 0009                                                      | 0109       | 0209        | 0309         | 2009                       | 3009        | 4009         | T262D337K006(1)S |  |  |                                                |
| 330.0                                            | D            | 20                             | 7.5                                | 12                                                     | .045                           | 4.3                                           | 0010                                                      | 0110       | 0210        | 0310         | 2010                       | 3010        | 4010         | T262D337M006(1)S |  |  |                                                |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C  |              |                                |                                    |                                                        |                                |                                               |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 82.0                                             | C            | 5                              | 4.0                                | 8                                                      | .085                           | 2.9                                           | 0011                                                      | 0111       | 0211        | 0311         | 2011                       | 3011        | 4011         | T262C826J010(1)S |  |  |                                                |
| 82.0                                             | C            | 10                             | 4.0                                | 8                                                      | .085                           | 2.9                                           | 0012                                                      | 0112       | 0212        | 0312         | 2012                       | 3012        | 4012         | T262C826K010(1)S |  |  |                                                |
| 100.0                                            | C            | 5                              | 5.0                                | 8                                                      | .075                           | 3.0                                           | 0013                                                      | 0113       | 0213        | 0313         | 2013                       | 3013        | 4013         | T262C107J010(1)S |  |  |                                                |
| 100.0                                            | C            | 10                             | 5.0                                | 8                                                      | .075                           | 3.0                                           | 0014                                                      | 0114       | 0214        | 0314         | 2014                       | 3014        | 4014         | T262C107K010(1)S |  |  |                                                |
| 100.0                                            | C            | 20                             | 5.0                                | 8                                                      | .075                           | 3.0                                           | 0015                                                      | 0115       | 0215        | 0315         | 2015                       | 3015        | 4015         | T262C107M010(1)S |  |  |                                                |
| 120.0                                            | C            | 5                              | 6.0                                | 8                                                      | .070                           | 3.2                                           | 0016                                                      | 0116       | 0216        | 0316         | 2016                       | 3016        | 4016         | T262C127J010(1)S |  |  |                                                |
| 120.0                                            | C            | 10                             | 6.0                                | 8                                                      | .070                           | 3.2                                           | 0017                                                      | 0117       | 0217        | 0317         | 2017                       | 3017        | 4017         | T262C127K010(1)S |  |  |                                                |
| 180.0                                            | D            | 5                              | 9.0                                | 8                                                      | .060                           | 3.7                                           | 0018                                                      | 0118       | 0218        | 0318         | 2018                       | 3018        | 4018         | T262D187J010(1)S |  |  |                                                |
| 180.0                                            | D            | 10                             | 9.0                                | 8                                                      | .060                           | 3.7                                           | 0019                                                      | 0119       | 0219        | 0319         | 2019                       | 3019        | 4019         | T262D187K010(1)S |  |  |                                                |
| 220.0                                            | D            | 5                              | 10.0                               | 10                                                     | .055                           | 3.9                                           | 0020                                                      | 0120       | 0220        | 0320         | 2020                       | 3020        | 4020         | T262D227J010(1)S |  |  |                                                |
| 220.0                                            | D            | 10                             | 10.0                               | 10                                                     | .055                           | 3.9                                           | 0021                                                      | 0121       | 0221        | 0321         | 2021                       | 3021        | 4021         | T262D227K010(1)S |  |  |                                                |
| 220.0                                            | D            | 20                             | 10.0                               | 10                                                     | .055                           | 3.9                                           | 0022                                                      | 0122       | 0222        | 0322         | 2022                       | 3022        | 4022         | T262D227M010(1)S |  |  |                                                |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C |              |                                |                                    |                                                        |                                |                                               |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 56.0                                             | C            | 5                              | 4.0                                | 6                                                      | .100                           | 2.6                                           | 0023                                                      | 0123       | 0223        | 0323         | 2023                       | 3023        | 4023         | T262C566J015(1)S |  |  |                                                |
| 56.0                                             | C            | 10                             | 4.0                                | 6                                                      | .100                           | 2.6                                           | 0024                                                      | 0124       | 0224        | 0324         | 2024                       | 3024        | 4024         | T262C566K015(1)S |  |  |                                                |
| 68.0                                             | C            | 5                              | 5.0                                | 6                                                      | .095                           | 2.7                                           | 0025                                                      | 0125       | 0225        | 0325         | 2025                       | 3025        | 4025         | T262C686J015(1)S |  |  |                                                |
| 68.0                                             | C            | 10                             | 5.0                                | 6                                                      | .095                           | 2.7                                           | 0026                                                      | 0126       | 0226        | 0326         | 2026                       | 3026        | 4026         | T262C686K015(1)S |  |  |                                                |
| 68.0                                             | C            | 20                             | 5.0                                | 6                                                      | .095                           | 2.7                                           | 0027                                                      | 0127       | 0227        | 0327         | 2027                       | 3027        | 4027         | T262C686M015(1)S |  |  |                                                |
| 120.0                                            | D            | 5                              | 9.0                                | 8                                                      | .070                           | 3.5                                           | 0028                                                      | 0128       | 0228        | 0328         | 2028                       | 3028        | 4028         | T262D127J015(1)S |  |  |                                                |
| 120.0                                            | D            | 10                             | 9.0                                | 8                                                      | .070                           | 3.5                                           | 0029                                                      | 0129       | 0229        | 0329         | 2029                       | 3029        | 4029         | T262D127K015(1)S |  |  |                                                |
| 150.0                                            | D            | 5                              | 10.0                               | 8                                                      | .065                           | 3.6                                           | 0030                                                      | 0130       | 0230        | 0330         | 2030                       | 3030        | 4030         | T262D157J015(1)S |  |  |                                                |
| 150.0                                            | D            | 10                             | 10.0                               | 8                                                      | .065                           | 3.6                                           | 0031                                                      | 0131       | 0231        | 0331         | 2031                       | 3031        | 4031         | T262D157K015(1)S |  |  |                                                |
| 150.0                                            | D            | 20                             | 10.0                               | 8                                                      | .065                           | 3.6                                           | 0032                                                      | 0132       | 0232        | 0332         | 2032                       | 3032        | 4032         | T262D157M015(1)S |  |  |                                                |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C |              |                                |                                    |                                                        |                                |                                               |                                                           |            |             |              |                            |             |              |                  |  |  |                                                |
| 27.0                                             | C            | 5                              | 2.5                                | 5                                                      | .145                           | 2.2                                           | 0033                                                      | 0133       | 0233        | 0333         | 2033                       | 3033        | 4033         | T262C276J020(1)S |  |  |                                                |
| 27.0                                             | C            | 10                             | 2.5                                | 5                                                      | .145                           | 2.2                                           | 0034                                                      | 0134       | 0234        | 0334         | 2034                       | 3034        | 4034         | T262C276K020(1)S |  |  |                                                |
| 33.0                                             | C            | 5                              | 3.5                                | 5                                                      | .130                           | 2.3                                           | 0035                                                      | 0135       | 0235        | 0335         | 2035                       | 3035        | 4035         | T262C336J020(1)S |  |  |                                                |
| 33.0                                             | C            | 10                             | 3.5                                | 5                                                      | .130                           | 2.3                                           | 0036                                                      | 0136       | 0236        | 0336         | 2036                       | 3036        | 4036         | T262C336K020(1)S |  |  |                                                |
| 33.0                                             | C            | 20                             | 3.5                                | 5                                                      | .130                           | 2.3                                           | 0037                                                      | 0137       | 0237        | 0337         | 2037                       | 3037        | 4037         | T262C336M020(1)S |  |  |                                                |
| 39.0                                             | C            | 5                              | 4.0                                | 5                                                      | .120                           | 2.4                                           | 0038                                                      | 0138       | 0238        | 0338         | 2038                       | 3038        | 4038         | T262C396J020(1)S |  |  |                                                |
| 39.0                                             | C            | 10                             | 4.0                                | 5                                                      | .120                           | 2.4                                           | 0039                                                      | 0139       | 0239        | 0339         | 2039                       | 3039        | 4039         | T262C396K020(1)S |  |  |                                                |
| 47.0                                             | C            | 5                              | 4.5                                | 6                                                      | .110                           | 2.5                                           | 0040                                                      | 0140       | 0240        | 0340         | 2040                       | 3040        | 4040         | T262C476J020(1)S |  |  |                                                |
| 47.0                                             | C            | 10                             | 4.5                                | 6                                                      | .110                           | 2.5                                           | 0041                                                      | 0141       | 0241        | 0341         | 2041                       | 3041        | 4041         | T262C476K020(1)S |  |  |                                                |
| 47.0                                             | C            | 20                             | 4.5                                | 6                                                      | .110                           | 2.5                                           | 0042                                                      | 0142       | 0242        | 0342         | 2042                       | 3042        | 4042         | T262C476M020(1)S |  |  |                                                |
| 56.0                                             | D            | 5                              | 5.5                                | 6                                                      | .100                           | 2.9                                           | 0043                                                      | 0143       | 0243        | 0343         | 2043                       | 3043        | 4043         | T262D566J020(1)S |  |  |                                                |
| 56.0                                             | D            | 10                             | 5.5                                | 6                                                      | .100                           | 2.9                                           | 0044                                                      | 0144       | 0244        | 0344         | 2044                       | 3044        | 4044         | T262D566K020(1)S |  |  |                                                |
| 68.0                                             | D            | 5                              | 7.0                                | 6                                                      | .095                           | 3.0                                           | 0045                                                      | 0145       | 0245        | 0345         | 2045                       | 3045        | 4045         | T262D686J020(1)S |  |  |                                                |
| 68.0                                             | D            | 10                             | 7.0                                | 6                                                      | .095                           | 3.0                                           | 0046                                                      | 0146       | 0246        | 0346         | 2046                       | 3046        | 4046         | T262D686K020(1)S |  |  |                                                |
| 68.0                                             | D            | 20                             | 7.0                                | 6                                                      | .095                           | 3.0                                           | 0047                                                      | 0147       | 0247        | 0347         | 2047                       | 3047        | 4047         | T262D686M020(1)S |  |  |                                                |
| 82.0                                             | D            | 5                              | 8.0                                | 6                                                      | .085                           | 3.1                                           | 0048                                                      | 0148       | 0248        | 0348         | 2048                       | 3048        | 4048         | T262D826J020(1)S |  |  |                                                |
| 82.0                                             | D            | 10                             | 8.0                                | 6                                                      | .085                           | 3.1                                           | 0049                                                      | 0149       | 0249        | 0349         | 2049                       | 3049        | 4049         | T262D826K020(1)S |  |  |                                                |
| 100.0                                            | D            | 5                              | 10.0                               | 8                                                      | .075                           | 3.3                                           | 0050                                                      | 0150       | 0250        | 0350         | 2050                       | 3050        | 4050         | T262D107J020(1)S |  |  |                                                |
| 100.0                                            | D            | 10                             | 10.0                               | 8                                                      | .075                           | 3.3                                           | 0051                                                      | 0151       | 0251        | 0351         | 2051                       | 3051        | 4051         | T262D107K020(1)S |  |  |                                                |
| 100.0                                            | D            | 20                             | 10.0                               | 8                                                      | .075                           | 3.3                                           | 0052                                                      | 0152       | 0252        | 0352         | 2052                       | 3052        | 4052         | T262D107M020(1)S |  |  |                                                |

(1) To complete the T262 Series Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 34.

T262 Series Tantalum  
Hermetically Sealed



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003 T262 (CSR21) SERIES

## RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T262 SERIES                  |                                                        |                                |                                               | MIL-PRF-39003/09 (CSR21) CAPACITORS                       |            |             |              |                            |             |              |                                                |
|--------------------------------------------------|--------------|--------------------------------|------------------------------------|--------------------------------------------------------|--------------------------------|-----------------------------------------------|-----------------------------------------------------------|------------|-------------|--------------|----------------------------|-------------|--------------|------------------------------------------------|
|                                                  |              |                                | D.C.<br>LEAKAGE<br>μA@25°C<br>MAX. | MAX.<br>DISSI-<br>PATION<br>FACTOR<br>%@25°C,<br>1 kHz | MAX. ESR<br>Ω@25°C,<br>100 kHz | MAX. RIPPLE<br>CURRENT<br>Arms@25°C<br>40 kHz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS.) |            |             |              |                            |             |              | KEMET<br>EQUIVALENT<br>MILITARY<br>PART NUMBER |
|                                                  |              |                                |                                    |                                                        |                                |                                               | MIL-PRF-39003/9D<br>EXPONENTIAL                           |            |             |              | MIL-PRF-39003/9D<br>GRADED |             |              |                                                |
|                                                  |              |                                |                                    |                                                        |                                |                                               | M<br>(1.0)                                                | P<br>(0.1) | R<br>(0.01) | S<br>(0.001) | B<br>(0.1)                 | C<br>(0.01) | D<br>(0.001) |                                                |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C |              |                                |                                    |                                                        |                                |                                               |                                                           |            |             |              |                            |             |              |                                                |
| 22.0                                             | C            | 5                              | 4.0                                | 4                                                      | .160                           | 2.1                                           | 0053                                                      | 0153       | 0253        | 0353         | 2053                       | 3053        | 4053         | T262C226J035(1)S                               |
| 22.0                                             | C            | 10                             | 4.0                                | 4                                                      | .160                           | 2.1                                           | 0054                                                      | 0154       | 0254        | 0354         | 2054                       | 3054        | 4054         | T262C226K035(1)S                               |
| 22.0                                             | C            | 20                             | 4.0                                | 4                                                      | .160                           | 2.1                                           | 0055                                                      | 0155       | 0255        | 0355         | 2055                       | 3055        | 4055         | T262C226M035(1)S                               |
| 27.0                                             | D            | 5                              | 4.5                                | 4                                                      | .145                           | 2.4                                           | 0056                                                      | 0156       | 0256        | 0356         | 2056                       | 3056        | 4056         | T262D276J035(1)S                               |
| 27.0                                             | D            | 10                             | 4.5                                | 4                                                      | .145                           | 2.4                                           | 0057                                                      | 0157       | 0257        | 0357         | 2057                       | 3057        | 4057         | T262D276K035(1)S                               |
| 33.0                                             | D            | 5                              | 5.5                                | 5                                                      | .130                           | 2.5                                           | 0058                                                      | 0158       | 0258        | 0358         | 2058                       | 3058        | 4058         | T262D336J035(1)S                               |
| 33.0                                             | D            | 10                             | 5.5                                | 5                                                      | .130                           | 2.5                                           | 0059                                                      | 0159       | 0259        | 0359         | 2059                       | 3059        | 4059         | T262D336K035(1)S                               |
| 33.0                                             | D            | 20                             | 5.5                                | 5                                                      | .130                           | 2.5                                           | 0060                                                      | 0160       | 0260        | 0360         | 2060                       | 3060        | 4060         | T262D336M035(1)S                               |
| 39.0                                             | D            | 5                              | 7.0                                | 5                                                      | .120                           | 2.6                                           | 0061                                                      | 0161       | 0261        | 0361         | 2061                       | 3061        | 4061         | T262D396J035(1)S                               |
| 39.0                                             | D            | 10                             | 7.0                                | 5                                                      | .120                           | 2.6                                           | 0062                                                      | 0162       | 0262        | 0362         | 2062                       | 3062        | 4062         | T262D396K035(1)S                               |
| 47.0                                             | D            | 5                              | 8.0                                | 5                                                      | .110                           | 2.7                                           | 0063                                                      | 0163       | 0263        | 0363         | 2063                       | 3063        | 4063         | T262D476J035(1)S                               |
| 47.0                                             | D            | 10                             | 8.0                                | 5                                                      | .110                           | 2.7                                           | 0064                                                      | 0164       | 0264        | 0364         | 2064                       | 3064        | 4064         | T262D476K035(1)S                               |
| 47.0                                             | D            | 20                             | 8.0                                | 5                                                      | .110                           | 2.7                                           | 0065                                                      | 0165       | 0265        | 0365         | 2065                       | 3065        | 4065         | T262D476M035(1)S                               |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C |              |                                |                                    |                                                        |                                |                                               |                                                           |            |             |              |                            |             |              |                                                |
| 5.6                                              | C            | 5                              | 2.2                                | 3                                                      | .300                           | 1.5                                           | 0066                                                      | 0166       | 0266        | 0366         | 2066                       | 3066        | 4066         | T262C565J050(1)S                               |
| 5.6                                              | C            | 10                             | 2.2                                | 3                                                      | .300                           | 1.5                                           | 0067                                                      | 0167       | 0267        | 0367         | 2067                       | 3067        | 4067         | T262C565K050(1)S                               |
| 6.8                                              | C            | 5                              | 2.2                                | 3                                                      | .275                           | 1.6                                           | 0068                                                      | 0168       | 0268        | 0368         | 2068                       | 3068        | 4068         | T262C685J050(1)S                               |
| 6.8                                              | C            | 10                             | 2.2                                | 3                                                      | .275                           | 1.6                                           | 0069                                                      | 0169       | 0269        | 0369         | 2069                       | 3069        | 4069         | T262C685K050(1)S                               |
| 6.8                                              | C            | 20                             | 2.2                                | 3                                                      | .275                           | 1.6                                           | 0070                                                      | 0170       | 0270        | 0370         | 2070                       | 3070        | 4070         | T262C685M050(1)S                               |
| 8.2                                              | C            | 5                              | 2.5                                | 3                                                      | .250                           | 1.6                                           | 0071                                                      | 0171       | 0271        | 0371         | 2071                       | 3071        | 4071         | T262C825J050(1)S                               |
| 8.2                                              | C            | 10                             | 2.5                                | 3                                                      | .250                           | 1.6                                           | 0072                                                      | 0172       | 0272        | 0372         | 2072                       | 3072        | 4072         | T262C825K050(1)S                               |
| 10.0                                             | C            | 5                              | 2.5                                | 3                                                      | .230                           | 1.7                                           | 0073                                                      | 0173       | 0273        | 0373         | 2073                       | 3073        | 4073         | T262C106J050(1)S                               |
| 10.0                                             | C            | 10                             | 2.5                                | 3                                                      | .230                           | 1.7                                           | 0074                                                      | 0174       | 0274        | 0374         | 2074                       | 3074        | 4074         | T262C106K050(1)S                               |
| 10.0                                             | C            | 20                             | 2.5                                | 3                                                      | .230                           | 1.7                                           | 0075                                                      | 0175       | 0275        | 0375         | 2075                       | 3075        | 4075         | T262C106M050(1)S                               |
| 12.0                                             | C            | 5                              | 3.0                                | 3                                                      | .210                           | 1.8                                           | 0076                                                      | 0176       | 0276        | 0376         | 2076                       | 3076        | 4076         | T262C126J050(1)S                               |
| 12.0                                             | C            | 10                             | 3.0                                | 3                                                      | .210                           | 1.8                                           | 0077                                                      | 0177       | 0277        | 0377         | 2077                       | 3077        | 4077         | T262C126K050(1)S                               |
| 15.0                                             | C            | 5                              | 4.0                                | 3                                                      | .190                           | 1.9                                           | 0078                                                      | 0178       | 0278        | 0378         | 2078                       | 3078        | 4078         | T262C156J050(1)S                               |
| 15.0                                             | C            | 10                             | 4.0                                | 3                                                      | .190                           | 1.9                                           | 0079                                                      | 0179       | 0279        | 0379         | 2079                       | 3079        | 4079         | T262C156K050(1)S                               |
| 15.0                                             | C            | 20                             | 4.0                                | 3                                                      | .190                           | 1.9                                           | 0080                                                      | 0180       | 0280        | 0380         | 2080                       | 3080        | 4080         | T262C156M050(1)S                               |
| 18.0                                             | C            | 5                              | 4.5                                | 4                                                      | .175                           | 2.0                                           | 0081                                                      | 0181       | 0281        | 0381         | 2081                       | 3081        | 4081         | T262C186J050(1)S                               |
| 18.0                                             | C            | 10                             | 4.5                                | 4                                                      | .175                           | 2.0                                           | 0082                                                      | 0182       | 0282        | 0382         | 2082                       | 3082        | 4082         | T262C186K050(1)S                               |
| 22.0                                             | D            | 5                              | 5.5                                | 4                                                      | .160                           | 2.3                                           | 0083                                                      | 0183       | 0283        | 0383         | 2083                       | 3083        | 4083         | T262D226J050(1)S                               |
| 22.0                                             | D            | 10                             | 5.5                                | 4                                                      | .160                           | 2.3                                           | 0084                                                      | 0184       | 0284        | 0384         | 2084                       | 3084        | 4084         | T262D226K050(1)S                               |
| 22.0                                             | D            | 20                             | 5.5                                | 4                                                      | .160                           | 2.3                                           | 0085                                                      | 0185       | 0285        | 0385         | 2085                       | 3085        | 4085         | T262D226M050(1)S                               |

(1) To complete the T262 Series Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 34.

# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003 T216 (CSS13) & T256 (CSS33) SERIES



T216 and T256 are KEMET's new designation for MIL-Style CSS13 and CSS33 capacitors. The T216/T256 Series is qualified to all failure rates per MIL-PRF-39003/10. Products meeting this specification have passed rigorous test requirements and are used in space applications or other equally demanding environments.

The T216 is available in capacitance ratings from .15  $\mu$ F to 330  $\mu$ F; voltage ratings from 6 VDC to 75 VDC. The T256 is available in capacitance ratings from 1.2  $\mu$ F to 1000  $\mu$ F with voltage ratings of 6 VDC to 50 VDC.

These capacitors provide circuit designers an excellent choice for blocking, bypass, decoupling, filtering and timing applications.

## CAPACITOR OUTLINE DRAWINGS



## DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | UNINSULATED                       |                                   | INSULATED                         |                                   | B<br>$\pm 0.002$<br>( $\pm .05$ ) | C<br>MAX.     |
|-----------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------|
|           | D<br>$\pm 0.005$<br>( $\pm .13$ ) | L<br>$\pm 0.031$<br>( $\pm .79$ ) | D<br>$\pm 0.010$<br>( $\pm .25$ ) | L<br>$\pm 0.031$<br>( $\pm .79$ ) |                                   |               |
| A         | 0.125 (3.18)                      | 0.250 (6.35)                      | 0.135 (3.43)                      | 0.286 (7.26)                      | 0.020 (.51)                       | 0.422 (10.72) |
| B         | 0.175 (4.45)                      | 0.438 (11.13)                     | 0.185 (4.70)                      | 0.474 (12.04)                     | 0.020 (.51)                       | 0.610 (15.49) |
| C         | 0.279 (7.09)                      | 0.650 (16.51)                     | 0.289 (7.34)                      | 0.686 (17.42)                     | 0.025 (.64)                       | 0.822 (20.88) |
| D         | 0.341 (8.66)                      | 0.750 (19.05)                     | 0.351 (8.92)                      | 0.786 (19.96)                     | 0.025 (.64)                       | 0.922 (23.42) |

## ORDERING INFORMATION



\*Part Number Example: T216A105K050CS (14 digits – no spaces)

T216/T256 Series Tantalum  
Hermetically Sealed



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003 T216 (CSS13) & T256 (CSS33) SERIES

## MIL-PRF-39003/10 ORDERING INFORMATION

### M39003/10 — 3078S

Military Specification  
Document Number

S — designates sleeved  
U — designates unsleeved

Slash Sheet Number

MIL dash number signifies  
capacitance, voltage and failure  
rate (see ratings and part number  
tables).

## MARKING INFORMATION

### A CASE

|        |                                                                                                      |
|--------|------------------------------------------------------------------------------------------------------|
| 39003  | Military specification number                                                                        |
| 10 - K | Specification sheet number and trademark                                                             |
| 3078S  | Military dash number and "S" for sleeved                                                             |
| +J310  | Polarity, "J" for JAN date code (1st digit indicates year and the next two digits indicate the week) |
| XYA    | Lot, unique lot code                                                                                 |

### C & D CASE

|              |                                                                   |
|--------------|-------------------------------------------------------------------|
| M39003       | Military specification number                                     |
| 10-2049SJ    | Specification sheet number, military dash number and "J" for Jan. |
| +6.8 $\mu$ F | Positive terminal identifier and capacitance value                |
| 10% 35V      | Capacitance tolerance and voltage rating                          |
| 31433        | Source code                                                       |
| 0310 NAB K   | Date code, lot code, unique lot code, and trademark               |

### B CASE

|        |                                                                                          |
|--------|------------------------------------------------------------------------------------------|
| M39003 | Military specification number                                                            |
| 10 -   | Specification sheet number                                                               |
| 3082SJ | Military dash number and "J" for JAN                                                     |
| 31433  | Source code                                                                              |
| +310   | Polarity, date code (1st digit indicates year and the next two digits indicate the week) |
| NABK   | Lot code, unique lot code and trademark.                                                 |

NOTE: Marking will include S or U after the MIL dash number, a third letter following lot symbol or lot code designates a unique lot identifier, and a black band on negative end of case.

Black band on negative end.

## T216/(CSS13) RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF      | CASE<br>SIZE | KEMET EQUIVALENT<br>PART NUMBER FOR<br>CSS13 CAPACITORS | KEMET T216        |                   |                    |                         |                          |                                | MIL-PRF-39003 (CSS13) CAPACITORS                         |             |
|------------------------|--------------|---------------------------------------------------------|-------------------|-------------------|--------------------|-------------------------|--------------------------|--------------------------------|----------------------------------------------------------|-------------|
|                        |              |                                                         | DC LEAKAGE        |                   |                    | MAX. DISSIPATION FACTOR |                          | MAX. ESR<br>Ω @ 25°C<br>100kHz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS) |             |
|                        |              |                                                         | μA @ +25°<br>MAX. | μA @ +85°<br>MAX. | μA @ +125°<br>MAX. | % @ -55°C<br>+25°C MAX. | % @ -85°C<br>+125°C MAX. |                                | B<br>(0.1)                                               | C<br>(0.01) |
| 6 VOLT RATING AT 85°C  |              |                                                         |                   |                   |                    |                         |                          |                                |                                                          |             |
| 5.6                    | A            | T216A565K006CS                                          | .3                | 6.0               | 7.5                | 4                       | 4                        | .90                            |                                                          | 3001(1)     |
| 6.8                    | A            | T216A685K006CS                                          | .3                | 6.0               | 7.5                | 6                       | 6                        | .80                            |                                                          | 3002(1)     |
| 47.0                   | B            | T216B476K006CS                                          | 1.5               | 24.0              | 30.0               | 6                       | 6                        | .24                            |                                                          | 3003(1)     |
| 56.0                   | B            | T216B566K006CS                                          | 1.5               | 24.0              | 30.0               | 6                       | 6                        | .24                            |                                                          | 3004(1)     |
| 150.0                  | C            | T216C157K006CS                                          | 4.5               | 90.0              | 113.0              | 8                       | 8                        | .09                            |                                                          | 3005(1)     |
| 180.0                  | C            | T216C187K006CS                                          | 5.5               | 110.0             | 138.0              | 8                       | 8                        | .08                            |                                                          | 3006(1)     |
| 270.0                  | D            | T216D277K006CS                                          | 6.5               | 130.0             | 163.0              | 8                       | 8                        | .07                            |                                                          | 3007(1)     |
| 330.0                  | D            | T216D337K006CS                                          | 7.5               | 150.0             | 188.0              | 8                       | 8                        | .06                            |                                                          | 3008(1)     |
| 10 VOLT RATING AT 85°C |              |                                                         |                   |                   |                    |                         |                          |                                |                                                          |             |
| 3.9                    | A            | T216A395K010CS                                          | .3                | 6.0               | 7.5                | 4                       | 4                        | 1.00                           |                                                          | 3009(1)     |
| 4.7                    | A            | T216A475K010CS                                          | .4                | 7.0               | 8.8                | 4                       | 4                        | .90                            |                                                          | 3010(1)     |
| 27.0                   | B            | T216B276K010CS                                          | 2.0               | 40.0              | 50.0               | 6                       | 6                        | .25                            |                                                          | 3011(1)     |
| 33.0                   | B            | T216B336K010CS                                          | 2.5               | 50.0              | 63.0               | 6                       | 6                        | .24                            |                                                          | 3012(1)     |
| 39.0                   | B            | T216B396K010CS                                          | 2.5               | 50.0              | 63.0               | 6                       | 6                        | .24                            |                                                          | 3013(1)     |
| 82.0                   | C            | T216C826K010CS                                          | 4.0               | 80.0              | 100.0              | 6                       | 6                        | .12                            |                                                          | 3014(1)     |
| 100.0                  | C            | T216C107K010CS                                          | 5.0               | 100.0             | 125.0              | 8                       | 8                        | .11                            |                                                          | 3015(1)     |
| 120.0                  | C            | T216C127K010CS                                          | 6.0               | 120.0             | 150.0              | 8                       | 8                        | .10                            |                                                          | 3016(1)     |
| 180.0                  | D            | T216D187K010CS                                          | 9.0               | 180.0             | 226.0              | 8                       | 8                        | .08                            |                                                          | 3017(1)     |
| 220.0                  | D            | T216D227K010CS                                          | 10.0              | 200.0             | 250.0              | 8                       | 8                        | .07                            |                                                          | 3018(1)     |

(1) To complete, insert S for sleeved or U for unsleeved, if "U" ordered also use C-0100.

## RATINGS &amp; PART NUMBER REFERENCE T216/(CSS13) (Cont'd)

| CAPACITANCE<br>μF      | CASE<br>SIZE | KEMET EQUIVALENT<br>PART NUMBER FOR<br>CSS13 CAPACITORS | KEMET T216        |                   |                    |                         |                          |                                | MIL-PRF-39003 (CSS13) CAPACITORS                          |            |
|------------------------|--------------|---------------------------------------------------------|-------------------|-------------------|--------------------|-------------------------|--------------------------|--------------------------------|-----------------------------------------------------------|------------|
|                        |              |                                                         | DC LEAKAGE        |                   |                    | MAX. DISSIPATION FACTOR |                          | MAX. ESR<br>Ω @ 25°C<br>100kHz | DASH NUMBER REFERENCE                                     |            |
|                        |              |                                                         | μA @ +25°<br>MAX. | μA @ +85°<br>MAX. | μA @ +125°<br>MAX. | % @ -55°C<br>+25°C MAX. | % @ -85°C<br>+125°C MAX. |                                | FAILURE RATE LEVEL (%/1000 HRS<br>MIL-PRF-39003/10 GRADED | B<br>(0.1) |
| 15 VOLT RATING AT 85°C |              |                                                         |                   |                   |                    |                         |                          |                                |                                                           |            |
| 2.7                    | A            | T216A275K015CS                                          | .3                | 6.0               | 7.5                | 4                       | 4                        | 1.20                           |                                                           | 3019(1)    |
| 3.3                    | A            | T216A335K015CS                                          | .4                | 8.0               | 10.0               | 4                       | 4                        | 1.00                           |                                                           | 3020(1)    |
| 18.0                   | B            | T216B186K015CS                                          | 2.0               | 35.0              | 44.0               | 6                       | 6                        | .27                            |                                                           | 3021(1)    |
| 22.0                   | B            | T216B226K015CS                                          | 2.0               | 40.0              | 50.0               | 6                       | 6                        | .26                            |                                                           | 3022(1)    |
| 56.0                   | C            | T216C566K015CS                                          | 4.0               | 80.0              | 100.0              | 6                       | 6                        | .15                            |                                                           | 3023(1)    |
| 68.0                   | C            | T216C686K015CS                                          | 5.0               | 100.0             | 125.0              | 6                       | 6                        | .13                            |                                                           | 3024(1)    |
| 120.0                  | D            | T216D127K015CS                                          | 9.0               | 180.0             | 226.0              | 8                       | 8                        | .09                            |                                                           | 3025(1)    |
| 150.0                  | D            | T216D157K015CS                                          | 10.0              | 220.0             | 250.0              | 8                       | 8                        | .09                            |                                                           | 3026(1)    |
| 20 VOLT RATING AT 85°C |              |                                                         |                   |                   |                    |                         |                          |                                |                                                           |            |
| 1.2                    | A            | T216A125K020CS                                          | .3                | 6.0               | 7.5                | 4                       | 4                        | 1.40                           |                                                           | 3027(1)    |
| 1.5                    | A            | T216A155K020CS                                          | .3                | 6.0               | 7.5                | 4                       | 4                        | 1.30                           |                                                           | 3028(1)    |
| 1.8                    | A            | T216A185K020CS                                          | .3                | 6.0               | 7.5                | 4                       | 4                        | 1.25                           |                                                           | 3029(1)    |
| 2.2                    | A            | T216A225K020CS                                          | .4                | 8.0               | 10.0               | 4                       | 4                        | 1.20                           |                                                           | 3030(1)    |
| 8.2                    | B            | T216B825K020CS                                          | 1.0               | 20.0              | 25.0               | 6                       | 6                        | .39                            |                                                           | 3031(1)    |
| 10.0                   | B            | T216B106K020CS                                          | 1.5               | 30.0              | 38.0               | 6                       | 6                        | .35                            |                                                           | 3032(1)    |
| 12.0                   | B            | T216B126K020CS                                          | 1.8               | 35.0              | 44.0               | 6                       | 6                        | .32                            |                                                           | 3033(1)    |
| 15.0                   | B            | T216B156K020CS                                          | 2.0               | 40.0              | 50.0               | 6                       | 6                        | .29                            |                                                           | 3034(1)    |
| 27.0                   | C            | T216C276K020CS                                          | 2.5               | 50.0              | 63.0               | 6                       | 6                        | .21                            |                                                           | 3035(1)    |
| 33.0                   | C            | T216C336K020CS                                          | 3.5               | 70.0              | 88.0               | 6                       | 6                        | .19                            |                                                           | 3036(1)    |
| 39.0                   | C            | T216C396K020CS                                          | 4.0               | 80.0              | 100.0              | 6                       | 6                        | .17                            |                                                           | 3037(1)    |
| 47.0                   | C            | T216C476K020CS                                          | 4.5               | 90.0              | 113.0              | 6                       | 6                        | .16                            |                                                           | 3038(1)    |
| 56.0                   | D            | T216D566K020BS                                          | 5.5               | 110.0             | 138.0              | 6                       | 6                        | .13                            | 2039(1)                                                   |            |
| 68.0                   | D            | T216D686K020BS                                          | 7.0               | 140.0             | 175.0              | 6                       | 6                        | .12                            | 2040(1)                                                   |            |
| 82.0                   | D            | T216D826K020BS                                          | 8.0               | 160.0             | 200.0              | 6                       | 6                        | .11                            | 2041(1)                                                   |            |
| 100.0                  | D            | T216D107K020BS                                          | 10.0              | 200.0             | 250.0              | 8                       | 8                        | .10                            | 2042(1)                                                   |            |
| 35 VOLT RATING AT 85°C |              |                                                         |                   |                   |                    |                         |                          |                                |                                                           |            |
| 5.6                    | B            | T216B565K035BS                                          | 1.3               | 25.0              | 32.0               | 4                       | 4                        | .47                            | 2043(1)                                                   |            |
| 6.8                    | B            | T216B685K035BS                                          | 1.5               | 30.0              | 38.0               | 6                       | 6                        | .43                            | 2044(1)                                                   |            |
| 22.0                   | C            | T216C226K035BS                                          | 4.0               | 40.0              | 100.0              | 6                       | 6                        | .25                            | 2045(1)                                                   |            |
| 27.0                   | D            | T216D276K035BS                                          | 4.5               | 90.0              | 113.0              | 6                       | 6                        | .18                            | 2046(1)                                                   |            |
| 33.0                   | D            | T216D336K035BS                                          | 5.5               | 110.0             | 138.0              | 6                       | 6                        | .17                            | 2047(1)                                                   |            |
| 39.0                   | D            | T216D396K035BS                                          | 7.0               | 140.0             | 175.0              | 6                       | 6                        | .15                            | 2048(1)                                                   |            |
| 47.0                   | D            | T216D476K035BS                                          | 8.0               | 160.0             | 200.0              | 6                       | 6                        | .14                            | 2049(1)                                                   |            |
| 50 VOLT RATING AT 85°C |              |                                                         |                   |                   |                    |                         |                          |                                |                                                           |            |
| .12                    | A            | T216A124K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 6.50                           |                                                           | 3067(1)    |
| .15                    | A            | T216A154K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 5.50                           |                                                           | 3068(1)    |
| .18                    | A            | T216A184K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 5.00                           |                                                           | 3069(1)    |
| .22                    | A            | T216A224K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 4.00                           |                                                           | 3070(1)    |
| .27                    | A            | T216A274K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 3.50                           |                                                           | 3071(1)    |
| .33                    | A            | T216A334K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 3.30                           |                                                           | 3072(1)    |
| .39                    | A            | T216A394K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 3.20                           |                                                           | 3073(1)    |
| .47                    | A            | T216A474K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 3.00                           |                                                           | 3074(1)    |
| .56                    | A            | T216A564K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 2.50                           |                                                           | 3075(1)    |
| .68                    | A            | T216A684K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 1.80                           |                                                           | 3076(1)    |
| .82                    | A            | T216A824K050CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 1.60                           |                                                           | 3077(1)    |
| 1.0                    | A            | T216A105K050CS                                          | .4                | 8.0               | 10.0               | 2                       | 4                        | 1.40                           |                                                           | 3078(1)    |
| 1.2                    | B            | T216B125K050CS                                          | .4                | 9.0               | 11.0               | 4                       | 4                        | 1.20                           |                                                           | 3079(1)    |
| 1.5                    | B            | T216B155K050CS                                          | .6                | 12.0              | 15.0               | 4                       | 4                        | 1.10                           |                                                           | 3080(1)    |
| 1.8                    | B            | T216B185K050CS                                          | .7                | 14.0              | 18.0               | 4                       | 4                        | .92                            |                                                           | 3081(1)    |
| 2.2                    | B            | T216B225K050CS                                          | .8                | 17.0              | 22.0               | 4                       | 4                        | .80                            |                                                           | 3082(1)    |
| 2.7                    | B            | T216B275K050CS                                          | 1.0               | 20.0              | 25.0               | 4                       | 4                        | .68                            |                                                           | 3083(1)    |
| 3.3                    | B            | T216B335K050CS                                          | 1.2               | 25.0              | 32.0               | 4                       | 4                        | .62                            |                                                           | 3084(1)    |
| 3.9                    | B            | T216B395K050CS                                          | 1.5               | 30.0              | 38.0               | 4                       | 4                        | .56                            |                                                           | 3085(1)    |
| 4.7                    | B            | T216B475K050BS                                          | 1.7               | 35.0              | 44.0               | 4                       | 4                        | .51                            | 2086(1)                                                   |            |
| 5.6                    | C            | T216C565K050CS                                          | 2.2               | 45.0              | 56.0               | 4                       | 4                        | .44                            |                                                           | 3087(1)    |
| 6.8                    | C            | T216C685K050CS                                          | 2.2               | 45.0              | 56.0               | 6                       | 6                        | .40                            |                                                           | 3088(1)    |
| 8.2                    | C            | T216C825K050CS                                          | 2.5               | 50.0              | 63.0               | 6                       | 6                        | .36                            |                                                           | 3089(1)    |
| 10.0                   | C            | T216C106K050CS                                          | 2.5               | 50.0              | 63.0               | 6                       | 6                        | .33                            |                                                           | 3090(1)    |
| 12.0                   | C            | T216C126K050BS                                          | 3.0               | 60.0              | 75.0               | 6                       | 6                        | .30                            | 2091(1)                                                   |            |
| 15.0                   | C            | T216C156K020BS                                          | 4.0               | 80.0              | 100.0              | 6                       | 6                        | .27                            | 2092(1)                                                   |            |
| 18.0                   | C            | T216C186K050BS                                          | 4.5               | 90.0              | 113.0              | 6                       | 6                        | .25                            | 2093(1)                                                   |            |
| 22.0                   | D            | T216D226K050BS                                          | 5.5               | 100.0             | 138.0              | 6                       | 6                        | .20                            | 2094(1)                                                   |            |

(1) To complete, insert S for sleeved or U for unsleeved, if "U" ordered also use C-0100.

T216/T256 Series Tantalum  
Hermetically Sealed



# TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003 T216 (CSS13) & T256 (CSS33) SERIES

## RATINGS & PART NUMBER REFERENCE T216/(CSS13) (Cont'd)

| CAPACITANCE<br>μF      | CASE<br>SIZE | KEMET EQUIVALENT<br>PART NUMBER FOR<br>CSS13 CAPACITORS | KEMET T216 SERIES |                   |                    |                         |                          |                                | MIL-PRF-39003 (CSS13) CAPACITORS                                                    |             |
|------------------------|--------------|---------------------------------------------------------|-------------------|-------------------|--------------------|-------------------------|--------------------------|--------------------------------|-------------------------------------------------------------------------------------|-------------|
|                        |              |                                                         | DC LEAKAGE        |                   |                    | MAX. DISSIPATION FACTOR |                          | MAX. ESR<br>Ω @ 25°C<br>100kHz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS)<br>MIL-PRF-39003/10 GRADED |             |
|                        |              |                                                         | μA @ +25°<br>MAX. | μA @ +85°<br>MAX. | μA @ +125°<br>MAX. | % @ -55°C<br>+25°C MAX. | % @ -85°C<br>+125°C MAX. |                                | B<br>(0.1)                                                                          | C<br>(0.01) |
| 75 VOLT RATING AT 85°C |              |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| .15                    | A            | T216A154K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 4.4                            |                                                                                     | 3097(1)     |
| .18                    | A            | T216A184K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 4.0                            |                                                                                     | 3098(1)     |
| .22                    | A            | T216A224K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 3.5                            |                                                                                     | 3099(1)     |
| .27                    | A            | T216A274K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 3.1                            |                                                                                     | 3100(1)     |
| .33                    | A            | T216A334K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 2.8                            |                                                                                     | 3101(1)     |
| .39                    | A            | T216A394K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 2.6                            |                                                                                     | 3102(1)     |
| .47                    | A            | T216A474K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 2.4                            |                                                                                     | 3103(1)     |
| .56                    | A            | T216A564K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 2.25                           |                                                                                     | 3104(1)     |
| .68                    | A            | T216A684K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 2.10                           |                                                                                     | 3105(1)     |
| .82                    | B            | T216B824K075CS                                          | .3                | 5.0               | 6.3                | 2                       | 4                        | 1.47                           |                                                                                     | 3106(1)     |
| 1.0                    | B            | T216B105K075CS                                          | .4                | 5.0               | 6.3                | 2                       | 4                        | 1.40                           |                                                                                     | 3107(1)     |
| 1.2                    | B            | T216B125K075CS                                          | .4                | 5.0               | 6.3                | 4                       | 4                        | 1.33                           |                                                                                     | 3108(1)     |
| 1.5                    | B            | T216B155K075CS                                          | .6                | 10.0              | 13.0               | 4                       | 4                        | 1.06                           |                                                                                     | 3109(1)     |
| 1.8                    | B            | T216B185K075CS                                          | .7                | 10.0              | 13.0               | 4                       | 4                        | .92                            |                                                                                     | 3110(1)     |
| 2.2                    | B            | T216B225K075CS                                          | .8                | 15.0              | 19.0               | 4                       | 4                        | .80                            |                                                                                     | 3111(1)     |
| 2.7                    | B            | T216B275K075BS                                          | 1.0               | 15.0              | 19.0               | 4                       | 4                        | .68                            | 2112(1)                                                                             |             |
| 3.3                    | B            | T216B335K075BS                                          | 1.2               | 20.0              | 25.0               | 4                       | 4                        | .62                            | 2113(1)                                                                             |             |
| 3.9                    | B            | T216B395K075BS                                          | 1.5               | 20.0              | 25.0               | 4                       | 4                        | .56                            | 2114(1)                                                                             |             |
| 4.7                    | C            | T216C475K075BS                                          | 3.0               | 60.0              | 75.0               | 4                       | 4                        | .47                            | 2115(1)                                                                             |             |
| 5.6                    | C            | T216C565K075BS                                          | 3.0               | 60.0              | 75.0               | 4                       | 4                        | .44                            | 2116(1)                                                                             |             |
| 6.8                    | C            | T216C685K075BS                                          | 5.0               | 100.0             | 125.0              | 6                       | 6                        | .44                            | 2117(1)                                                                             |             |
| 8.2                    | C            | T216C825K075BS                                          | 5.0               | 100.0             | 125.0              | 6                       | 6                        | .36                            | 2118(1)                                                                             |             |
| 10.0                   | C            | T216C106K075BS                                          | 5.0               | 100.0             | 125.0              | 6                       | 6                        | .33                            | 2119(1)                                                                             |             |
| 12.0                   | D            | T216D126K075BS                                          | 5.0               | 100.0             | 125.0              | 6                       | 6                        | .26                            | 2120(1)                                                                             |             |
| 15.0                   | D            | T216D156K075BS                                          | 7.0               | 140.0             | 175.0              | 6                       | 6                        | .23                            | 2121(1)                                                                             |             |

## T256/(CSS33) RATINGS AND PART NUMBER REFERENCE

| CAPACITANCE<br>μF      | KEMET T256 SERIES |                                                         |                   |                   |                    |                         |                          |                                | MIL-PRF-39003 (CSS33) CAPACITORS                                                    |             |
|------------------------|-------------------|---------------------------------------------------------|-------------------|-------------------|--------------------|-------------------------|--------------------------|--------------------------------|-------------------------------------------------------------------------------------|-------------|
|                        | CASE<br>SIZE      | KEMET EQUIVALENT<br>PART NUMBER FOR<br>CSS33 CAPACITORS | DC LEAKAGE        |                   |                    | MAX. DISSIPATION FACTOR |                          | MAX. ESR<br>Ω @ 25°C<br>100kHz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS)<br>MIL-PRF-39003/10 GRADED |             |
|                        |                   |                                                         | μA @ +25°<br>MAX. | μA @ +85°<br>MAX. | μA @ +125°<br>MAX. | % @ -55°C<br>+25°C MAX. | % @ -85°C<br>+125°C MAX. |                                | B<br>(0.1)                                                                          | C<br>(0.01) |
| 6 VOLT RATING AT 85°C  |                   |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| 10.0                   | A                 | T256A106K006CS                                          | .5                | 2.0               | 2.0                | 6                       | 6                        | .70                            |                                                                                     | 3500(1)     |
| 12.0                   | A                 | T256A126K006CS                                          | .5                | 2.0               | 2.0                | 6                       | 6                        | .60                            |                                                                                     | 3501(1)     |
| 100.0                  | B                 | T256B107K006CS                                          | 1.0               | 3.0               | 3.0                | 8                       | 8                        | .20                            |                                                                                     | 3502(1)     |
| 330.0                  | C                 | T256C337K006BS                                          | 2.0               | 8.0               | 8.0                | 8                       | 8                        | .065                           | 2503(1)                                                                             |             |
| 390.0                  | C                 | T256C397K006BS                                          | 2.0               | 8.0               | 8.0                | 10                      | 10                       | .065                           | 2504(1)                                                                             |             |
| 470.0                  | C                 | T256C477K006BS                                          | 2.0               | 8.0               | 8.0                | 10                      | 10                       | .060                           | 2505(1)                                                                             |             |
| 680.0                  | D                 | T256D687K006CS                                          | 5.0               | 10.0              | 10.0               | 10                      | 10                       | .060                           |                                                                                     | 3506(1)     |
| 820.0                  | D                 | T256D827K006CS                                          | 5.0               | 10.0              | 10.0               | 10                      | 10                       | .055                           |                                                                                     | 3507(1)     |
| 1000.0                 | D                 | T256D108K006CS                                          | 5.0               | 10.0              | 10.0               | 10                      | 10                       | .050                           |                                                                                     | 3508(1)     |
| 10 VOLT RATING AT 85°C |                   |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| 6.8                    | A                 | T256A685K010CS                                          | .5                | 2.0               | 2.0                | 6                       | 6                        | .80                            |                                                                                     | 3509(1)     |
| 8.2                    | A                 | T256A825K010CS                                          | .5                | 2.0               | 2.0                | 6                       | 6                        | .70                            |                                                                                     | 3510(1)     |
| 47.0                   | B                 | T256B476K010CS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .22                            |                                                                                     | 3511(1)     |
| 56.0                   | B                 | T256B566K010CS                                          | 1.0               | 4.0               | 4.0                | 6                       | 6                        | .20                            |                                                                                     | 3512(1)     |
| 68.0                   | B                 | T256B686K010CS                                          | 1.0               | 4.0               | 4.0                | 6                       | 6                        | .18                            |                                                                                     | 3513(1)     |
| 82.0                   | B                 | T256B826K010CS                                          | 1.0               | 4.0               | 4.0                | 6                       | 6                        | .15                            |                                                                                     | 3514(1)     |
| 220.0                  | C                 | T256C227K010BS                                          | 1.0               | 7.0               | 7.0                | 8                       | 8                        | .090                           | 2515(1)                                                                             |             |
| 270.0                  | C                 | T256C277K010BS                                          | 2.0               | 10.0              | 10.0               | 8                       | 8                        | .075                           | 2516(1)                                                                             |             |
| 390.0                  | D                 | T256D397K010CS                                          | 2.0               | 16.0              | 16.0               | 10                      | 10                       | .070                           |                                                                                     | 3517(1)     |
| 470.0                  | D                 | T256D477K010CS                                          | 4.0               | 16.0              | 16.0               | 10                      | 10                       | .065                           |                                                                                     | 3518(1)     |
| 560.0                  | D                 | T256D567K010CS                                          | 4.0               | 16.0              | 16.0               | 10                      | 10                       | .060                           |                                                                                     | 3519(1)     |

(1) To complete, insert S for sleeved or U for unsleeved, if "U" ordered also use C-0100.

## RATINGS AND PART NUMBER REFERENCE T256/(CSS33) (Cont'd)

| CAPACITANCE<br>μF      | KEMET T256 SERIES |                                                         |                   |                   |                    |                         |                          |                                | MIL-PRF-39003 (CSS33) CAPACITORS                                                    |             |
|------------------------|-------------------|---------------------------------------------------------|-------------------|-------------------|--------------------|-------------------------|--------------------------|--------------------------------|-------------------------------------------------------------------------------------|-------------|
|                        | CASE<br>SIZE      | KEMET EQUIVALENT<br>PART NUMBER FOR<br>CSS33 CAPACITORS | DC LEAKAGE        |                   |                    | MAX. DISSIPATION FACTOR |                          | MAX. ESR<br>Ω @ 25°C<br>100kHz | DASH NUMBER REFERENCE<br>FAILURE RATE LEVEL (%/1000 HRS)<br>MIL-PRF-39003/10 GRADED |             |
|                        |                   |                                                         | μA @ +25°<br>MAX. | μA @ +85°<br>MAX. | μA @ +125°<br>MAX. | % @ -55°C<br>+25°C MAX. | % @ -85°C<br>+125°C MAX. |                                | B<br>(0.1)                                                                          | C<br>(0.01) |
| 15 VOLT RATING AT 85°C |                   |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| 4.7                    | A                 | T256A475K015CS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | .90                            |                                                                                     | 3520(1)     |
| 5.6                    | A                 | T256A565K015CS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | .80                            |                                                                                     | 3521(1)     |
| 33.0                   | B                 | T256B336K015CS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .24                            |                                                                                     | 3522(1)     |
| 39.0                   | B                 | T256B396K015CS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .22                            |                                                                                     | 3523(1)     |
| 150.0                  | C                 | T256C157K015BS                                          | 1.0               | 7.0               | 7.0                | 8                       | 8                        | .10                            | 2524(1)                                                                             |             |
| 180.0                  | C                 | T256C187K015BS                                          | 2.0               | 10.0              | 10.0               | 8                       | 8                        | .09                            | 2525(1)                                                                             |             |
| 220.0                  | D                 | T256D227K015BS                                          | 2.0               | 10.0              | 10.0               | 8                       | 8                        | .07                            | 2526(1)                                                                             |             |
| 270.0                  | D                 | T256D277K015BS                                          | 2.0               | 16.0              | 16.0               | 8                       | 8                        | .065                           | 2527(1)                                                                             |             |
| 330.0                  | D                 | T256D337K015BS                                          | 2.0               | 16.0              | 16.0               | 8                       | 8                        | .060                           | 2528(1)                                                                             |             |
| 20 VOLT RATING AT 85°C |                   |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| 2.7                    | A                 | T256A275K020CS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | 1.15                           |                                                                                     | 3529(1)     |
| 3.3                    | A                 | T256A335K020CS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | .95                            |                                                                                     | 3530(1)     |
| 3.9                    | A                 | T256A395K020CS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | .90                            |                                                                                     | 3531(1)     |
| 18.0                   | B                 | T256B186K020CS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .27                            |                                                                                     | 3532(1)     |
| 22.0                   | B                 | T256B226K020BS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .26                            | 2533(1)                                                                             |             |
| 27.0                   | B                 | T256B276K020BS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .24                            | 2534(1)                                                                             |             |
| 56.0                   | C                 | T256C566K020CS                                          | 1.0               | 10.0              | 10.0               | 6                       | 6                        | .15                            |                                                                                     | 3535(1)     |
| 68.0                   | C                 | T256C686K020CS                                          | 1.0               | 10.0              | 10.0               | 6                       | 6                        | .14                            |                                                                                     | 3536(1)     |
| 82.0                   | C                 | T256C826K020BS                                          | 1.0               | 10.0              | 10.0               | 6                       | 6                        | .12                            | 2537(1)                                                                             |             |
| 100.0                  | C                 | T256C107K020BS                                          | 1.0               | 10.0              | 10.0               | 6                       | 6                        | .10                            | 2538(1)                                                                             |             |
| 120.0                  | C                 | T256C127K020BS                                          | 1.0               | 10.0              | 10.0               | 6                       | 6                        | .09                            | 2539(1)                                                                             |             |
| 150.0                  | D                 | T256D157K020BS                                          | 2.0               | 10.0              | 10.0               | 8                       | 8                        | .08                            | 2540(1)                                                                             |             |
| 180.0                  | D                 | T256D187K020BS                                          | 2.0               | 10.0              | 10.0               | 8                       | 8                        | .07                            | 2541(1)                                                                             |             |
| 35 VOLT RATING AT 85°C |                   |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| 1.8                    | A                 | T256A185K035BS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | .20                            | 2542(1)                                                                             |             |
| 8.2                    | B                 | T256B825K035BS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .40                            | 2543(1)                                                                             |             |
| 10.0                   | B                 | T256B106K035BS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .35                            | 2544(1)                                                                             |             |
| 33.0                   | C                 | T256C336K035BS                                          | 1.0               | 5.0               | 5.0                | 6                       | 6                        | .19                            | 2545(1)                                                                             |             |
| 39.0                   | C                 | T256C396K035BS                                          | 1.0               | 5.0               | 5.0                | 6                       | 6                        | .17                            | 2546(1)                                                                             |             |
| 47.0                   | C                 | T256C476K035BS                                          | 1.0               | 5.0               | 5.0                | 6                       | 6                        | .15                            | 2547(1)                                                                             |             |
| 56.0                   | D                 | T256D566K035BS                                          | 2.0               | 10.0              | 10.0               | 6                       | 6                        | .13                            | 2548(1)                                                                             |             |
| 68.0                   | D                 | T256D686K035BS                                          | 2.0               | 10.0              | 10.0               | 6                       | 6                        | .12                            | 2549(1)                                                                             |             |
| 50 VOLT RATING AT 85°C |                   |                                                         |                   |                   |                    |                         |                          |                                |                                                                                     |             |
| 1.2                    | A                 | T256A125K050BS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | 1.30                           | 2550(1)                                                                             |             |
| 1.5                    | A                 | T256A155K050BS                                          | .5                | 2.0               | 2.0                | 4                       | 4                        | 1.20                           | 2551(1)                                                                             |             |
| 5.6                    | B                 | T256B565K050BS                                          | 1.0               | 2.0               | 2.0                | 4                       | 4                        | .47                            | 2552(1)                                                                             |             |
| 6.8                    | B                 | T256B685K050BS                                          | 1.0               | 2.0               | 2.0                | 6                       | 6                        | .43                            | 2553(1)                                                                             |             |
| 22.0                   | C                 | T256C226K050BS                                          | 1.0               | 5.0               | 5.0                | 6                       | 6                        | .22                            | 2554(1)                                                                             |             |
| 27.0                   | C                 | T256C276K050BS                                          | 1.0               | 5.0               | 5.0                | 6                       | 6                        | .20                            | 2555(1)                                                                             |             |
| 33.0                   | D                 | T256D336K050BS                                          | 1.0               | 9.0               | 9.0                | 6                       | 6                        | .18                            | 2556(1)                                                                             |             |
| 39.0                   | D                 | T256D396K050BS                                          | 1.0               | 9.0               | 9.0                | 6                       | 6                        | .16                            | 2557(1)                                                                             |             |

(1) To complete, insert S for sleeved or U for unsleeved, if "U" ordered also use C-0100.



# TANTALUM MOLDED / AXIAL — MIL-PRF-49137/1&5

## T322 & T323 (CX01 & CX05) SERIES

The KEMET T322 AND T323 (CX01 & CX05) Series offers a complete line of extended range molded solid tantalum capacitors designed specifically for high speed automatic insertion applications. These capacitors offer an extremely high capacitance-to-volume ratio while still maintaining excellent performance characteristics.

Supplied in six axial lead tubular case sizes, these capacitors are ideally suited for use in printed wiring boards and all applications requiring a high degree of packaging density and can be supplied in bulk packaging or lead-taped on reels.

The T322/T323 Series dimensions and tight lead wire-to-body concentricity permit installation by the same automatic insertion equipment used for diodes and resistors. Available in working voltages of

2, 4, 6, 10, 15, 20, 25, 35, and 50 volts. Operating temperature range -55°C to +85°C at full rated voltage and with  $\frac{2}{3}$  85°C rated voltage at 125°C.

The gold color epoxy utilized permits laser marking with outstanding permanency and legibility.

T323 Series capacitors are qualified under MIL-PRF-49137/1 & 5 as Military Style CX01 & CX05.

Typical applications include decoupling, blocking, bypassing and filtering in commercial computers, data processing, communications, and other electronic equipment. The low ESR/impedance at high frequencies offered by this capacitor is especially suitable for decoupling required by high speed computers.

## PERFORMANCE CHARACTERISTICS

- CAPACITANCE/VOLTAGE RANGE:**  
0.1-330 $\mu$ F, 2-50 Volts.
- CAPACITANCE TOLERANCE:** Available in standard EIA nominal values with  $\pm 20\%$ ,  $\pm 10\%$  and  $\pm 5\%$  tolerance.
- DISSIPATION FACTOR:** Maximum DF limits are shown in corresponding series part number listings on pages 44-48. See Application Notes Section, page 76 for additional description.
- DC LEAKAGE CURRENT:** Each corresponding part number table lists maximum leakage current for each capacitor on pages 44 through 48. See Application Notes Section, page 76 for additional description.
- RATED VOLTAGE; WORKING VOLTAGE; SURGE VOLTAGE; REVERSE VOLTAGE:** See Application Notes Section, page 76 & 77 for description.
- AC RIPPLE VOLTAGE:** Permissible AC ripple voltage is related to equivalent series resistance (ESR) and power dissipation capability. Maximum power dissipation for each case size is listed in Table below. For additional description see page 79.

| Case Size | Power Dissipation (max.) @ 25°C (watts) |
|-----------|-----------------------------------------|
| A         | .060                                    |
| B         | .070                                    |
| C         | .080                                    |
| D         | .090                                    |
| E         | .100                                    |
| F         | .110                                    |

Maximum Power Dissipation Capability @ 25°C

- IMPEDANCE and ESR:** See Application Notes Section, pages 77 & 78 for description. Reference ESR values are shown in adjoining column, this page.
- ENVIRONMENTAL CONSIDERATIONS:**
  - Shock Test: MIL-STD-202, Method 213.
  - Thermal Shock, MIL-STD-202, Method 107.
  - Moisture Resistance: MIL-STD-202, Method 106.
  - Solderability: MIL-STD-202, Method 208.

**T322 ESR (OHMS) at 100 kHz @ +25°C**  
(The ESR values provided below are for reference only. No warranty, as stated on page 3 and reincorporated here, is made as to the accuracy of these values for any particular T322 Series product.)

| Cap. $\mu$ F | 6 Volt | 10 Volt | 15 Volt | 20 Volt | 25 Volt | 35 Volt | 50 Volt |
|--------------|--------|---------|---------|---------|---------|---------|---------|
| 0.10         |        |         |         |         |         | 26.0    | 26.0    |
| 0.12         |        |         |         |         |         | 26.0    | 26.0    |
| 0.15         |        |         |         |         |         | 21.0    | 21.0    |
| 0.18         |        |         |         |         |         | 21.0    | 21.0    |
| 0.22         |        |         |         |         |         | 17.0    | 17.0    |
| 0.27         |        |         |         |         |         | 17.0    | 17.0    |
| 0.33         |        |         |         |         |         | 15.0    | 15.0    |
| 0.39         |        |         |         |         |         | 15.0    | 15.0    |
| 0.47         |        |         |         |         | 16.0    | 13.0    | 13.0    |
| 0.56         |        |         |         |         | 14.0    | 13.0    | 13.0    |
| 0.68         |        |         |         |         | 12.0    | 10.0    | 10.0    |
| 0.82         |        |         |         |         | 12.0    | 10.0    | 10.0    |
| 1.00         |        |         |         | 10.0    | 10.0    | 8.0     | 8.0     |
| 1.20         |        |         |         | 10.0    | 10.0    | 8.0     | 8.0     |
| 1.50         |        |         | 10.0    | 9.0     | 8.0     | 6.0     | 5.0     |
| 1.80         |        |         | 10.0    | 9.0     | 8.0     | 6.0     | 5.0     |
| 2.20         |        | 13.0    | 8.0     | 7.0     | 6.0     | 5.0     | 3.5     |
| 2.70         |        | 13.0    | 8.0     | 7.0     | 6.0     | 5.0     | 3.5     |
| 3.30         | 13.0   | 10.0    | 6.0     | 5.5     | 5.0     | 4.0     | 3.0     |
| 3.90         | 13.0   | 10.0    | 6.0     | 5.5     | 5.0     | 4.0     | 3.0     |
| 4.70         | 10.0   | 8.0     | 5.0     | 4.5     | 4.0     | 3.0     | 2.5     |
| 5.60         | 10.0   | 8.0     | 5.0     | 4.5     | 4.0     | 3.0     | 2.5     |
| 6.80         | 8.0    | 6.0     | 4.0     | 3.6     | 3.1     | 2.5     | 2.0     |
| 8.20         | 8.0    | 6.0     | 4.0     | 3.6     | 3.1     | 2.5     | 2.0     |
| 10.0         | 6.0    | 5.0     | 3.2     | 2.9     | 2.5     | 2.0     | 1.6     |
| 12.0         | 6.0    | 5.0     | 3.2     | 2.9     | 2.5     | 2.0     | 1.6     |
| 15.0         | 5.0    | 3.7     | 2.5     | 2.3     | 2.0     | 1.6     | 1.2     |
| 18.0         | 5.0    | 3.7     | 2.5     | 2.3     | 2.0     | 1.6     | 1.2     |
| 22.0         | 3.7    | 2.7     | 2.0     | 1.8     | 1.5     | 1.3     | 1.0     |
| 27.0         | 3.7    | 2.7     | 2.0     | 1.8     | 1.5     | 1.3     | 1.0     |
| 33.0         | 3.0    | 2.1     | 1.6     | 1.4     | 1.2     | 1.0     |         |
| 39.0         | 3.0    | 2.1     | 1.6     | 1.4     | 1.2     | 1.0     |         |
| 47.0         | 2.0    | 1.7     | 1.3     | 1.2     | 1.0     | 0.8     |         |
| 56.0         | 2.0    | 1.7     | 1.3     | 1.2     | 1.0     |         |         |
| 68.0         | 1.8    | 1.3     | 1.0     | 0.9     | 0.8     |         |         |
| 82.0         | 1.8    | 1.3     | 1.0     | 0.9     |         |         |         |
| 100.0        | 1.6    | 1.0     | 0.8     | 0.6     |         |         |         |
| 120.0        | 1.6    | 1.0     | 0.8     |         |         |         |         |
| 150.0        | 0.9    | 0.8     | 0.6     |         |         |         |         |
| 180.0        | 0.9    | 0.8     |         |         |         |         |         |
| 220.0        | 0.9    | 0.6     |         |         |         |         |         |
| 270.0        | 0.9    |         |         |         |         |         |         |
| 330.0        | 0.7    |         |         |         |         |         |         |

For additional Environmental Test Information see pages 80, 81 and 82.

- LEAD MATERIAL:** Solder coated steel core with copper ply per MIL-STD-1276.
- LEAD TAPE and REEL:** Reeling per specification RS-296. See pages 71 and 73 for additional information.

Effective September 30, 2005, the KEMET T322 Series is RoHS compliant.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | D (MAX)     | L (MAX)      | W          |
|-----------|-------------|--------------|------------|
| A         | .095 (2.41) | .260 (6.6)   | .020 (.51) |
| B         | .110 (2.79) | .290 (7.37)  | .020 (.51) |
| C         | .180 (4.57) | .345 (8.76)  | .020 (.51) |
| D         | .180 (4.57) | .420 (10.67) | .020 (.51) |
| E         | .280 (7.11) | .530 (13.46) | .025 (.64) |
| F         | .300 (7.62) | .710 (18.03) | .025 (.64) |

### T322 & T323 ORDERING INFORMATION

**TANTALUM** — T — **SERIES** — 32X — **CASE SIZE** — A — **CAPACITANCE IN PICO FARADS** — 474 — **VOLTAGE RATING** — M — **CAPACITANCE TOLERANCE** — 035 — **LEAD MATERIAL** — A — **FAILURE RATE LEVEL** — S — **SPECIFICATION (when necessary)** — C\*

Sub-Miniature, Molded, Polar, Solid Tantalum, Insert appropriate number to replace letter "X" — 322 or 323 (CX01, CX05).

A, B, C, D, E, or F

First two digits are significant figures. Third digit is number of zeros following.

Reeling Per EIA Specification RS-296

S — Standard  
T — 100% Tin

A — Not Applicable

\*M — ±20%  
\*K — ±10%  
\*J — ±5%

\*Part Number Example: T322A474M035AS (14 digits – no spaces)

\* M & K only tolerances available for T323 Series.

### MIL-PRF-49137/5 MILITARY ORDERING INFORMATION

**TYPE** — CX — **STYLE** — 05 — **VOLTAGE** — D — **CAPACITANCE TOLERANCE** — 225 — **CAPACITANCE TOLERANCE** — K

Capacitor, Fixed, Solid Tantalum, Molded, Non-hermetically Sealed

01, 05 (T323) A, B, C, and D

| Symbol | Rated (85°C)<br>Volts, DC | Surge (85°C)<br>Volts, DC |
|--------|---------------------------|---------------------------|
| D      | 6                         | 8.0                       |
| F      | 10                        | 13.0                      |
| H      | 15                        | 20.0                      |
| J      | 20                        | 26.0                      |
| K      | 25                        | 32.0                      |
| M      | 35                        | 46.0                      |
| N      | 50                        | 65.0                      |

| Symbol | Capacitance Tolerance<br>Percent (±) |
|--------|--------------------------------------|
| K      | 10                                   |
| M      | 20                                   |

**CAPACITANCE TOLERANCE**  
The nominal capacitance value, expressed in picofarads (pF), is identified by a three-digit number; the first two digits represent significant figures and the last digit specifies the number of zeros to follow.

### CAPACITOR MARKING

105M — Capacitance Value (pF), Capacitance Tolerance  
+25 K — Polarity, Voltage, KEMET  
0324 — Date Code (Year, Week)



# TANTALUM MOLDED / AXIAL — MIL-PRF-49137/1 & 5

## T322 & T323 (CX01 & CX05) SERIES

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T322 SERIES    |                            |                                                    | CX01 & CX05 CAPACITORS<br>PER MIL-PRF-49137/1 & 5 |                      |
|--------------------------------------------------|--------------|--------------------------------|----------------------|----------------------------|----------------------------------------------------|---------------------------------------------------|----------------------|
|                                                  |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MILITARY<br>PART NUMBER                           | KEMET<br>PART NUMBER |
| 2 VOLT RATING AT 85°C — 1.3 VOLT RATING AT 125°C |              |                                |                      |                            |                                                    |                                                   |                      |
| 6.8                                              | A            | 5,10,20                        | T322A685(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 8.2                                              | A            | 5,10,20                        | T322A825(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 10.0                                             | A            | 5,10,20                        | T322A106(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 12.0                                             | B            | 5,10,20                        | T322B126(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 15.0                                             | B            | 5,10,20                        | T322B156(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 18.0                                             | B            | 5,10,20                        | T322B186(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 22.0                                             | B            | 5,10,20                        | T322B226(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 27.0                                             | B            | 5,10,20                        | T322B276(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 33.0                                             | B            | 5,10,20                        | T322B336(1)002AS     | 0.5                        | 10                                                 |                                                   |                      |
| 39.0                                             | C            | 5,10,20                        | T322C396(1)002AS     | 0.6                        | 10                                                 |                                                   |                      |
| 47.0                                             | C            | 5,10,20                        | T322C476(1)002AS     | 0.8                        | 10                                                 |                                                   |                      |
| 56.0                                             | C            | 5,10,20                        | T322C566(1)002AS     | 0.9                        | 10                                                 |                                                   |                      |
| 68.0                                             | C            | 5,10,20                        | T322C686(1)002AS     | 1.1                        | 10                                                 |                                                   |                      |
| 4 VOLT RATING AT 85°C — 2.7 VOLT RATING AT 125°C |              |                                |                      |                            |                                                    |                                                   |                      |
| 4.7                                              | A            | 5,10,20                        | T322A475(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 5.6                                              | A            | 5,10,20                        | T322A565(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 6.8                                              | A            | 5,10,20                        | T322A685(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 8.2                                              | B            | 5,10,20                        | T322B825(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 10.0                                             | B            | 5,10,20                        | T322B106(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 12.0                                             | B            | 5,10,20                        | T322B126(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 15.0                                             | B            | 5,10,20                        | T322B156(1)004AS     | 0.5                        | 8                                                  |                                                   |                      |
| 18.0                                             | B            | 5,10,20                        | T322B186(1)004AS     | 0.6                        | 8                                                  |                                                   |                      |
| 22.0                                             | B            | 5,10,20                        | T322B226(1)004AS     | 0.7                        | 8                                                  |                                                   |                      |
| 27.0                                             | C            | 5,10,20                        | T322C276(1)004AS     | 0.9                        | 8                                                  |                                                   |                      |
| 33.0                                             | C            | 5,10,20                        | T322C336(1)004AS     | 1.1                        | 8                                                  |                                                   |                      |
| 39.0                                             | C            | 5,10,20                        | T322C396(1)004AS     | 1.2                        | 8                                                  |                                                   |                      |
| 47.0                                             | C            | 5,10,20                        | T322C476(1)004AS     | 1.5                        | 8                                                  |                                                   |                      |
| 56.0                                             | D            | 5,10,20                        | T322D566(1)004AS     | 1.8                        | 8                                                  |                                                   |                      |
| 68.0                                             | D            | 5,10,20                        | T322D686(1)004AS     | 2.2                        | 8                                                  |                                                   |                      |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C   |              |                                |                      |                            |                                                    |                                                   |                      |
| 3.3                                              | A            | 5,10,20                        | T322A335(1)006AS     | 0.5                        | 4                                                  |                                                   |                      |
| 3.9                                              | A            | 5,10,20                        | T322A395(1)006AS     | 0.5                        | 4                                                  |                                                   |                      |
| 4.7                                              | A            | 5                              | T322A475J006AS       | 0.5                        | 4                                                  |                                                   |                      |
| 4.7                                              | A            | 10                             | T322A475K006AS       | 0.5                        | 4                                                  | CX05D475K                                         | T323A475K006AS       |
| 4.7                                              | A            | 20                             | T322A475M006AS       | 0.5                        | 4                                                  | CX05D475M                                         | T323A475M006AS       |
| 5.6                                              | B            | 5                              | T322B565J006AS       | 0.5                        | 4                                                  |                                                   |                      |
| 5.6                                              | B            | 10                             | T322B565K006AS       | 0.5                        | 4                                                  | CX01D565K                                         | T323B565K 006AS      |
| 5.6                                              | B            | 20                             | T322B565M006AS       | 0.5                        | 4                                                  | CX01D565M                                         | T323B565M006AS       |
| 6.8                                              | B            | 5                              | T322B685J006AS       | 0.5                        | 6                                                  |                                                   |                      |
| 6.8                                              | B            | 10                             | T322B685K006AS       | 0.5                        | 6                                                  | CX01D685K                                         | T323B685K006AS       |
| 6.8                                              | B            | 20                             | T322B685M006AS       | 0.5                        | 6                                                  | CX01D685M                                         | T323B685M006AS       |
| 8.2                                              | B            | 5                              | T322B825J006AS       | 0.5                        | 6                                                  |                                                   |                      |
| 8.2                                              | B            | 10                             | T322B825K006AS       | 0.5                        | 6                                                  | CX01D825K                                         | T323B825K 006AS      |
| 8.2                                              | B            | 20                             | T322B825M006AS       | 0.5                        | 6                                                  | CX01D825M                                         | T323B825M006AS       |
| 10.0                                             | B            | 5                              | T322B106J006AS       | 0.5                        | 6                                                  |                                                   |                      |
| 10.0                                             | B            | 10                             | T322B106K006AS       | 0.5                        | 6                                                  | CX01D106K                                         | T323B106K006AS       |
| 10.0                                             | B            | 20                             | T322B106M006AS       | 0.5                        | 6                                                  | CX01D106M                                         | T323B106M006AS       |
| 12.0                                             | B            | 5                              | T322B126J006AS       | 0.6                        | 6                                                  |                                                   |                      |
| 12.0                                             | B            | 10                             | T322B126K006AS       | 0.6                        | 6                                                  | CX01D126K                                         | T323B126K 006AS      |
| 12.0                                             | B            | 20                             | T322B126M006AS       | 0.6                        | 6                                                  | CX01D126M                                         | T323B126M006AS       |
| 15.0                                             | B            | 5                              | T322B156J006AS       | 0.7                        | 6                                                  |                                                   |                      |
| 15.0                                             | B            | 10                             | T322B156K006AS       | 0.7                        | 6                                                  | CX05D156K                                         | T323B156K006AS       |
| 15.0                                             | B            | 20                             | T322B156M006AS       | 0.7                        | 6                                                  | CX05D156M                                         | T323B156M006AS       |
| 18.0                                             | C            | 5,10,20                        | T322C186(1)006AS     | 0.9                        | 6                                                  |                                                   |                      |
| 22.0                                             | C            | 5,10,20                        | T322C226(1)006AS     | 1.1                        | 6                                                  |                                                   |                      |
| 27.0                                             | C            | 5,10,20                        | T322C276(1)006AS     | 1.3                        | 6                                                  |                                                   |                      |
| 33.0                                             | C            | 5                              | T322C336J006AS       | 1.5                        | 6                                                  |                                                   |                      |
| 33.0                                             | C            | 10                             | T322C336K006AS       | 1.5                        | 6                                                  | CX05D336K                                         | T323C336K006AS       |
| 33.0                                             | C            | 20                             | T322C336M006AS       | 1.5                        | 6                                                  | CX05D336M                                         | T323C336M006AS       |
| 39.0                                             | D            | 5,10,20                        | T322D396(1)006AS     | 1.9                        | 6                                                  |                                                   |                      |
| 47.0                                             | D            | 5                              | T322D476J006AS       | 2.3                        | 6                                                  |                                                   |                      |
| 47.0                                             | D            | 10                             | T322D476K006AS       | 2.3                        | 6                                                  | CX05D476K                                         | T323D476K006AS       |
| 47.0                                             | D            | 20                             | T322D476M006AS       | 2.3                        | 6                                                  | CX05D476M                                         | T323D476M006AS       |
| 56.0                                             | D            | 5,10,20                        | T322D566(1)006AS     | 2.7                        | 6                                                  |                                                   |                      |
| 68.0                                             | D            | 5,10,20                        | T322D686(1)006AS     | 3.3                        | 6                                                  |                                                   |                      |

(1) To complete KEMET Part Number, insert Capacitance Tolerance Symbol as follows: M — ±20%, K — ±10%, J — ±5%  
Bold Face lines indicate preferred part types and values.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T322 SERIES    |                            |                                                    | CX01 & CX05 CAPACITORS<br>PER MIL-PRF-49137/1 & 5 |                                  |
|---------------------------------------------------------|--------------|--------------------------------|----------------------|----------------------------|----------------------------------------------------|---------------------------------------------------|----------------------------------|
|                                                         |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MILITARY<br>PART NUMBER                           | KEMET<br>PART NUMBER             |
| 6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                            |                                                    |                                                   |                                  |
| 82.0                                                    | E            | 5,10,20                        | T322E826(1)006AS     | 3.9                        | 8                                                  |                                                   |                                  |
| 100.0                                                   | E            | 5,10,20                        | T322E107(1)006AS     | 4.8                        | 8                                                  |                                                   |                                  |
| 120.0                                                   | E            | 5,10,20                        | T322E127(1)006AS     | 5.0                        | 8                                                  |                                                   |                                  |
| 150.0                                                   | E            | 5,10,20                        | T322E157(1)006AS     | 5.0                        | 8                                                  |                                                   |                                  |
| 180.0                                                   | E            | 5,10,20                        | T322E187(1)006AS     | 8.6                        | 8                                                  |                                                   |                                  |
| 220.0                                                   | E            | 5,10,20                        | T322E227(1)006AS     | 10.0                       | 8                                                  |                                                   |                                  |
| 270.0                                                   | F            | 5,10,20                        | T322F277(1)006AS     | 10.0                       | 8                                                  |                                                   |                                  |
| 330.0                                                   | F            | 5,10,20                        | T322F337(1)006AS     | 10.0                       | 8                                                  |                                                   |                                  |
| 10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C         |              |                                |                      |                            |                                                    |                                                   |                                  |
| 2.2                                                     | A            | 5,10,20                        | T322A225(1)010AS     | 0.5                        | 4                                                  | CX05F335K<br>CX05F335M                            | T323A335K010AS<br>T323A335M010AS |
| 2.7                                                     | A            | 5,10,20                        | T322A275(1)010AS     | 0.5                        | 4                                                  |                                                   |                                  |
| 3.3                                                     | A            | 5                              | T322A335J010AS       | 0.5                        | 4                                                  |                                                   |                                  |
| 3.3                                                     | A            | 10                             | T322A335K010AS       | 0.5                        | 4                                                  |                                                   |                                  |
| 3.3                                                     | A            | 20                             | T322A335M010AS       | 0.5                        | 4                                                  |                                                   |                                  |
| 3.9                                                     | B            | 5,10,20                        | T322B395(1)010AS     | 0.5                        | 4                                                  | CX05F106K<br>CX05F106M                            | T323B106K010AS<br>T323B106M010AS |
| 4.7                                                     | B            | 5,10,20                        | T322B475(1)010AS     | 0.5                        | 4                                                  |                                                   |                                  |
| 5.6                                                     | B            | 5,10,20                        | T322B565(1)010AS     | 0.5                        | 4                                                  |                                                   |                                  |
| 6.8                                                     | B            | 5,10,20                        | T322B685(1)010AS     | 0.5                        | 6                                                  |                                                   |                                  |
| 8.2                                                     | B            | 5,10,20                        | T322B825(1)010AS     | 0.7                        | 6                                                  |                                                   |                                  |
| 10.0                                                    | B            | 5                              | T322B106J010AS       | 0.8                        | 6                                                  |                                                   |                                  |
| 10.0                                                    | B            | 10                             | T322B106K010AS       | 0.8                        | 6                                                  |                                                   |                                  |
| 10.0                                                    | B            | 20                             | T322B106M010AS       | 0.8                        | 6                                                  |                                                   |                                  |
| 12.0                                                    | C            | 5,10,20                        | T322C126(1)010AS     | 1.0                        | 6                                                  |                                                   |                                  |
| 15.0                                                    | C            | 5,10,20                        | T322C156(1)010AS     | 1.2                        | 6                                                  |                                                   |                                  |
| 18.0                                                    | C            | 5,10,20                        | T322C186(1)010AS     | 1.4                        | 6                                                  |                                                   |                                  |
| 22.0                                                    | C            | 5                              | T322C226J010AS       | 1.5                        | 6                                                  |                                                   |                                  |
| 22.0                                                    | C            | 10                             | T322C226K010AS       | 1.5                        | 6                                                  |                                                   |                                  |
| 22.0                                                    | C            | 20                             | T322C226M010AS       | 1.5                        | 6                                                  |                                                   |                                  |
| 27.0                                                    | D            | 5                              | T322D276J010AS       | 2.2                        | 6                                                  | CX05F276K<br>CX05F276M                            | T323D276K010AS<br>T323D276M010AS |
| 27.0                                                    | D            | 10                             | T322D276K010AS       | 2.2                        | 6                                                  |                                                   |                                  |
| 27.0                                                    | D            | 20                             | T322D276M010AS       | 2.2                        | 6                                                  |                                                   |                                  |
| 33.0                                                    | D            | 5                              | T322D336J010AS       | 2.6                        | 6                                                  | CX05F336K<br>CX05F336M                            | T323D336K010AS<br>T323D336M010AS |
| 33.0                                                    | D            | 10                             | T322D336K010AS       | 2.6                        | 6                                                  |                                                   |                                  |
| 33.0                                                    | D            | 20                             | T322D336M010AS       | 2.6                        | 6                                                  |                                                   |                                  |
| 39.0                                                    | D            | 5                              | T322D396J010AS       | 3.1                        | 6                                                  | CX05F396K<br>CX05F396M                            | T323D396K010AS<br>T323D396M010AS |
| 39.0                                                    | D            | 10                             | T322D396K010AS       | 3.1                        | 6                                                  |                                                   |                                  |
| 39.0                                                    | D            | 20                             | T322D396M010AS       | 3.1                        | 6                                                  |                                                   |                                  |
| 47.0                                                    | D            | 5                              | T322D476J010AS       | 3.8                        | 6                                                  | CX05F476K<br>CX05F476M                            | T323D476K010AS<br>T323D476M010AS |
| 47.0                                                    | D            | 10                             | T322D476K010AS       | 3.8                        | 6                                                  |                                                   |                                  |
| 47.0                                                    | D            | 20                             | T322D476M010AS       | 3.8                        | 6                                                  |                                                   |                                  |
| 56.0                                                    | E            | 5,10,20                        | T322E566(1)010AS     | 4.4                        | 6                                                  |                                                   |                                  |
| 68.0                                                    | E            | 5,10,20                        | T322E686(1)010AS     | 5.0                        | 6                                                  |                                                   |                                  |
| 82.0                                                    | E            | 5,10,20                        | T322E826(1)010AS     | 5.0                        | 8                                                  |                                                   |                                  |
| 100.0                                                   | E            | 5,10,20                        | T322E107(1)010AS     | 8.0                        | 8                                                  |                                                   |                                  |
| 120.0                                                   | E            | 5,10,20                        | T322E127(1)010AS     | 9.6                        | 8                                                  |                                                   |                                  |
| 150.0                                                   | E            | 5,10,20                        | T322E157(1)010AS     | 10.0                       | 8                                                  |                                                   |                                  |
| 180.0                                                   | F            | 5,10,20                        | T322F187(1)010AS     | 10.0                       | 8                                                  |                                                   |                                  |
| 220.0                                                   | F            | 5,10,20                        | T322F227(1)010AS     | 10.0                       | 8                                                  |                                                   |                                  |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C        |              |                                |                      |                            |                                                    |                                                   |                                  |
| 1.5                                                     | A            | 5,10,20                        | T322A155(1)015AS     | 0.5                        | 4                                                  | CX05H225K<br>CX05H225M                            | T323A225K015AS<br>T323A225M015AS |
| 1.8                                                     | A            | 5,10,20                        | T322A185(1)015AS     | 0.5                        | 4                                                  |                                                   |                                  |
| 2.2                                                     | A            | 5                              | T322A225J015AS       | 0.5                        | 4                                                  |                                                   |                                  |
| 2.2                                                     | A            | 10                             | T322A225K015AS       | 0.5                        | 4                                                  |                                                   |                                  |
| 2.2                                                     | A            | 20                             | T322A225M015AS       | 0.5                        | 4                                                  |                                                   |                                  |
| 2.7                                                     | B            | 5,10,20                        | T322B275(1)015AS     | 0.5                        | 4                                                  | CX05H685K<br>CX05H685M                            | T323B685K015AS<br>T323B685M015AS |
| 3.3                                                     | B            | 5,10,20                        | T322B335(1)015AS     | 0.5                        | 4                                                  |                                                   |                                  |
| 3.9                                                     | B            | 5,10,20                        | T322B395(1)015AS     | 0.5                        | 4                                                  |                                                   |                                  |
| 4.7                                                     | B            | 5,10,20                        | T322B475(1)015AS     | 0.6                        | 4                                                  |                                                   |                                  |
| 5.6                                                     | B            | 5,10,20                        | T322B565(1)015AS     | 0.7                        | 4                                                  |                                                   |                                  |
| 6.8                                                     | B            | 5                              | T322B685J015AS       | 0.8                        | 6                                                  |                                                   |                                  |
| 6.8                                                     | B            | 10                             | T322B685K015AS       | 0.8                        | 6                                                  |                                                   |                                  |
| 6.8                                                     | B            | 20                             | T322B685M015AS       | 0.8                        | 6                                                  |                                                   |                                  |
| 8.2                                                     | C            | 5,10,20                        | T322C825(1)015AS     | 1.0                        | 6                                                  |                                                   |                                  |
| 10.0                                                    | C            | 5,10,20                        | T322C106(1)015AS     | 1.2                        | 6                                                  |                                                   |                                  |
| 12.0                                                    | C            | 5,10,20                        | T322C126(1)015AS     | 1.4                        | 6                                                  |                                                   |                                  |
| 15.0                                                    | C            | 5                              | T322C156J015AS       | 1.5                        | 6                                                  |                                                   |                                  |
| 15.0                                                    | C            | 10                             | T322C156K015AS       | 1.5                        | 6                                                  |                                                   |                                  |
| 15.0                                                    | C            | 20                             | T322C156M015AS       | 1.5                        | 6                                                  |                                                   |                                  |

(1) To complete KEMET Part Number, insert Capacitance Tolerance Symbol as follows: M — ±20%, K — ±10%, J — ±5%  
**Bold Face** lines indicate preferred part types and values.

T322/T323 Series Tantalum  
Molded / Axial



# TANTALUM MOLDED / AXIAL — MIL-PRF-49137/1 & 5

## T322 & T323 (CX01 & CX05) SERIES

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T322 SERIES    |                            |                                                    | CX01 & CX05 CAPACITORS<br>PER MIL-PRF-49137/1 & 5                     |                                                                                                |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|----------------------------|----------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MILITARY<br>PART NUMBER                                               | KEMET<br>PART NUMBER                                                                           |
| 15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                            |                                                    |                                                                       |                                                                                                |
| 18.0                                                      | D            | 5,10,20                        | T322D186(1)015AS     | 2.2                        | 6                                                  | CX05H226K<br>CX05H226M                                                | T323D226K015AS<br>T323D226M015AS                                                               |
| 22.0                                                      | D            | 5                              | T322D226J015AS       | 2.6                        | 6                                                  |                                                                       |                                                                                                |
| 22.0                                                      | D            | 10                             | T322D226K015AS       | 2.6                        | 6                                                  |                                                                       |                                                                                                |
| 22.0                                                      | D            | 20                             | T322D226M015AS       | 2.6                        | 6                                                  |                                                                       |                                                                                                |
| 27.0                                                      | D            | 5,10,20                        | T322D276(1)015AS     | 3.2                        | 6                                                  |                                                                       |                                                                                                |
| 33.0                                                      | D            | 5                              | T322D336J015AS       | 4.0                        | 6                                                  | CX05H336K<br>CX05H336M                                                | T323D336K015AS<br>T323E336M015AS                                                               |
| 33.0                                                      | D            | 10                             | T322D336K015AS       | 4.0                        | 6                                                  |                                                                       |                                                                                                |
| 33.0                                                      | D            | 20                             | T322D336M015AS       | 4.0                        | 6                                                  |                                                                       |                                                                                                |
| 39.0                                                      | E            | 5,10,20                        | T322E396(1)015AS     | 4.7                        | 6                                                  |                                                                       |                                                                                                |
| 47.0                                                      | E            | 5,10,20                        | T322E476(1)015AS     | 5.0                        | 6                                                  |                                                                       |                                                                                                |
| 56.0                                                      | E            | 5,10,20                        | T322E566(1)015AS     | 6.7                        | 6                                                  |                                                                       |                                                                                                |
| 68.0                                                      | E            | 5,10,20                        | T322E686(1)015AS     | 8.2                        | 6                                                  |                                                                       |                                                                                                |
| 82.0                                                      | E            | 5,10,20                        | T322E826(1)015AS     | 9.8                        | 8                                                  |                                                                       |                                                                                                |
| 100.0                                                     | E            | 5,10,20                        | T322E107(1)015AS     | 10.0                       | 8                                                  |                                                                       |                                                                                                |
| 120.0                                                     | F            | 5,10,20                        | T322F127(1)015AS     | 10.0                       | 8                                                  |                                                                       |                                                                                                |
| 150.0                                                     | F            | 5,10,20                        | T322F157(1)015AS     | 10.0                       | 8                                                  |                                                                       |                                                                                                |
| 20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C          |              |                                |                      |                            |                                                    |                                                                       |                                                                                                |
| 1.0                                                       | A            | 5,10,20                        | T322A105(1)020AS     | 0.5                        | 4                                                  | CX05J155K<br>CX05J155M                                                | T323A155K020AS<br>T323A155M020AS                                                               |
| 1.2                                                       | A            | 5,10,20                        | T322A125(1)020AS     | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 1.5                                                       | A            | 5                              | T322A155J020AS       | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 1.5                                                       | A            | 10                             | T322A155K020AS       | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 1.5                                                       | A            | 20                             | T322A155M020AS       | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 1.8                                                       | B            | 5,10,20                        | T322B185(1)020AS     | 0.5                        | 4                                                  | CX05J475K<br>CX05J475M                                                | T323B475K020AS<br>T323B475M020AS                                                               |
| 2.2                                                       | B            | 5,10,20                        | T322B225(1)020AS     | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 2.7                                                       | B            | 5,10,20                        | T322B275(1)020AS     | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 3.3                                                       | B            | 5,10,20                        | T322B335(1)020AS     | 0.5                        | 4                                                  |                                                                       |                                                                                                |
| 3.9                                                       | B            | 5,10,20                        | T322B395(1)020AS     | 0.6                        | 4                                                  |                                                                       |                                                                                                |
| 4.7                                                       | B            | 5                              | T322B475J020AS       | 0.8                        | 4                                                  |                                                                       |                                                                                                |
| 4.7                                                       | B            | 10                             | T322B475K020AS       | 0.8                        | 4                                                  |                                                                       |                                                                                                |
| 4.7                                                       | B            | 20                             | T322B475M020AS       | 0.8                        | 4                                                  |                                                                       |                                                                                                |
| 5.6                                                       | C            | 5,10,20                        | T322C565(1)020AS     | 0.9                        | 4                                                  |                                                                       |                                                                                                |
| 6.8                                                       | C            | 5,10,20                        | T322C685(1)020AS     | 1.1                        | 6                                                  |                                                                       |                                                                                                |
| 8.2                                                       | C            | 5,10,20                        | T322C825(1)020AS     | 1.3                        | 6                                                  |                                                                       |                                                                                                |
| 10.0                                                      | C            | 5,10,20                        | T322C106(1)020AS     | 1.6                        | 6                                                  |                                                                       |                                                                                                |
| 12.0                                                      | D            | 5                              | T322D126J020AS       | 1.9                        | 6                                                  | CX05J126K<br>CX05J126M                                                | T323D126K020AS<br>T323D126M020AS                                                               |
| 12.0                                                      | D            | 10                             | T322D126K020AS       | 1.9                        | 6                                                  |                                                                       |                                                                                                |
| 12.0                                                      | D            | 20                             | T322D126M020AS       | 1.9                        | 6                                                  |                                                                       |                                                                                                |
| 15.0                                                      | D            | 5                              | T322D156J020AS       | 2.4                        | 6                                                  | CX05J156K<br>CX05J156M                                                | T323D156K020AS<br>T323D156M020AS                                                               |
| 15.0                                                      | D            | 10                             | T322D156K020AS       | 2.4                        | 6                                                  |                                                                       |                                                                                                |
| 15.0                                                      | D            | 20                             | T322D156M020AS       | 2.4                        | 6                                                  |                                                                       |                                                                                                |
| 18.0                                                      | D            | 5,10,20                        | T322D186(1)020AS     | 2.9                        | 6                                                  |                                                                       |                                                                                                |
| 22.0                                                      | D            | 5,10,20                        | T322D226(1)020AS     | 3.5                        | 6                                                  |                                                                       |                                                                                                |
| 27.0                                                      | E            | 5,10,20                        | T322E276(1)020AS     | 4.3                        | 6                                                  |                                                                       |                                                                                                |
| 33.0                                                      | E            | 5,10,20                        | T322E336(1)020AS     | 5.0                        | 6                                                  |                                                                       |                                                                                                |
| 39.0                                                      | E            | 5,10,20                        | T322E396(1)020AS     | 6.2                        | 6                                                  |                                                                       |                                                                                                |
| 47.0                                                      | E            | 5,10,20                        | T322E476(1)020AS     | 7.5                        | 6                                                  |                                                                       |                                                                                                |
| 56.0                                                      | E            | 5,10,20                        | T322E566(1)020AS     | 8.9                        | 6                                                  |                                                                       |                                                                                                |
| 68.0                                                      | E            | 5,10,20                        | T322E686(1)020AS     | 10.0                       | 6                                                  |                                                                       |                                                                                                |
| 82.0                                                      | F            | 5,10,20                        | T322F826(1)020AS     | 10.0                       | 8                                                  |                                                                       |                                                                                                |
| 100.0                                                     | F            | 5,10,20                        | T322F107(1)020AS     | 10.0                       | 8                                                  |                                                                       |                                                                                                |
| 25 VOLT RATING AT 85°C — 17 VOLT RATING AT 125°C          |              |                                |                      |                            |                                                    |                                                                       |                                                                                                |
| 0.47                                                      | A            | 5,10,20                        | T322A474(1)025AS     | 0.5                        | 3                                                  | CX05K105K<br>CX05K105M                                                | T323A105K025AS<br>T323A105M025AS                                                               |
| 0.56                                                      | A            | 5,10,20                        | T322A564(1)025AS     | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 0.68                                                      | A            | 5,10,20                        | T322A684(1)025AS     | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 0.82                                                      | A            | 5,10,20                        | T322A824(1)025AS     | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.0                                                       | A            | 5                              | T322A105J025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.0                                                       | A            | 10                             | T322A105K025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.0                                                       | A            | 20                             | T322A105M025AS       | 0.5                        | 3                                                  | CX01K155K<br>CX01K155M<br><br>CX01K185K<br>CX01K185M<br><br>CX05K225K | T323B155K025AS<br>T323B155M020AS<br><br>T323B185K025AS<br>T323B185M025AS<br><br>T323B225K025AS |
| 1.2                                                       | B            | 5,10,20                        | T322B125(1)025AS     | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.5                                                       | B            | 5                              | T322B155J025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.5                                                       | B            | 10                             | T322B155K025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.5                                                       | B            | 20                             | T322B155M025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.8                                                       | B            | 5                              | T322B185J025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.8                                                       | B            | 10                             | T322B185K025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 1.8                                                       | B            | 20                             | T322B185M025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 2.2                                                       | B            | 5                              | T322B225J025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |
| 2.2                                                       | B            | 10                             | T322B225K025AS       | 0.5                        | 3                                                  |                                                                       |                                                                                                |

(1) To complete KEMET Part Number, insert Capacitance Tolerance Symbol as follows: M — ±20%, K — ±10%, J — ±5%  
**Bold Face** lines indicate preferred part types and values.

# TANTALUM MOLDED / AXIAL — MIL-PRF-49137/1 & 5

## T322 & T323 (CX01 & CX05) SERIES



### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T322 SERIES    |                            |                                                    | CX01 & CX05 CAPACITORS<br>PER MIL-PRF-49137/1 & 5 |                                  |
|-----------------------------------------------------------|--------------|--------------------------------|----------------------|----------------------------|----------------------------------------------------|---------------------------------------------------|----------------------------------|
|                                                           |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MILITARY<br>PART NUMBER                           | KEMET<br>PART NUMBER             |
| 25 VOLT RATING AT 85°C — 17 VOLT RATING AT 125°C (Cont'd) |              |                                |                      |                            |                                                    |                                                   |                                  |
| 2.2                                                       | B            | 20                             | T322B225M025AS       | 0.5                        | 3                                                  | CX01/5K225M                                       | T323B225M025AS                   |
| 2.7                                                       | B            | 5,10,20                        | T322B275(1)025AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 3.3                                                       | B            | 5                              | T322B335J025AS       | 0.7                        | 3                                                  | CX05K335K<br>CX05K335M                            | T323B335K025AS                   |
| 3.3                                                       | B            | 10                             | T322B335K025AS       | 0.7                        | 3                                                  |                                                   | T323B335M025AS                   |
| 3.3                                                       | B            | 20                             | T322B335M025AS       | 0.7                        | 3                                                  |                                                   |                                  |
| 3.9                                                       | C            | 5,10,20                        | T322C395(1)025AS     | 0.8                        | 3                                                  | CX05K685K<br>CX05K685M                            | T323C685K025AS<br>T323C685M025AS |
| 4.7                                                       | C            | 5,10,20                        | T322C475(1)025AS     | 0.9                        | 4                                                  |                                                   |                                  |
| 5.6                                                       | C            | 5,10,20                        | T322C565(1)025AS     | 1.1                        | 4                                                  |                                                   |                                  |
| 6.8                                                       | C            | 5                              | T322C685J025AS       | 1.4                        | 4                                                  |                                                   |                                  |
| 6.8                                                       | C            | 10                             | T322C685K025AS       | 1.4                        | 4                                                  |                                                   |                                  |
| 6.8                                                       | C            | 20                             | T322C685M025AS       | 1.4                        | 4                                                  |                                                   |                                  |
| 8.2                                                       | C            | 5,10,20                        | T322C825(1)025AS     | 1.5                        | 4                                                  | CX05K106K<br>CX05K106M                            | T323C106K025AS<br>T323C106M025AS |
| 10.0                                                      | C            | 5                              | T322C106J025AS       | 1.5                        | 4                                                  |                                                   |                                  |
| 10.0                                                      | C            | 10                             | T322C106K025AS       | 1.5                        | 4                                                  |                                                   |                                  |
| 10.0                                                      | C            | 20                             | T322C106M025AS       | 1.5                        | 4                                                  |                                                   |                                  |
| 12.0                                                      | D            | 5,10,20                        | T322D126(1)025AS     | 2.4                        | 4                                                  |                                                   |                                  |
| 15.0                                                      | D            | 5,10,20                        | T322D156(1)025AS     | 3.0                        | 4                                                  |                                                   |                                  |
| 18.0                                                      | E            | 5,10,20                        | T322E186(1)025AS     | 3.6                        | 6                                                  |                                                   |                                  |
| 22.0                                                      | E            | 5,10,20                        | T322E226(1)025AS     | 4.4                        | 6                                                  |                                                   |                                  |
| 27.0                                                      | E            | 5,10,20                        | T322E276(1)025AS     | 5.4                        | 6                                                  |                                                   |                                  |
| 33.0                                                      | E            | 5,10,20                        | T322E336(1)025AS     | 6.6                        | 6                                                  |                                                   |                                  |
| 39.0                                                      | E            | 5,10,20                        | T322E396(1)025AS     | 7.8                        | 6                                                  |                                                   |                                  |
| 47.0                                                      | E            | 5,10,20                        | T322E476(1)025AS     | 9.4                        | 6                                                  |                                                   |                                  |
| 56.0                                                      | F            | 5,10,20                        | T322F566(1)025AS     | 10.0                       | 6                                                  |                                                   |                                  |
| 68.0                                                      | F            | 5,10,20                        | T322F686(1)025AS     | 10.0                       | 6                                                  |                                                   |                                  |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C          |              |                                |                      |                            |                                                    |                                                   |                                  |
| 0.1                                                       | A            | 5,10,20                        | T322A104(1)035AS     | 0.5                        | 3                                                  | CX05M334K<br>CX05M334M                            | T323A334K035AS<br>T323A334M035AS |
| 0.12                                                      | A            | 5,10,20                        | T322A124(1)035AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.15                                                      | A            | 5,10,20                        | T322A154(1)035AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.18                                                      | A            | 5,10,20                        | T322A184(1)035AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.22                                                      | A            | 5,10,20                        | T322A224(1)035AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.27                                                      | A            | 5,10,20                        | T322A274(1)035AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.33                                                      | A            | 5                              | T322A334J035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.33                                                      | A            | 10                             | T322A334K035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.33                                                      | A            | 20                             | T322A334M035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.39                                                      | A            | 5,10,20                        | T322A394(1)035AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.47                                                      | A            | 5                              | T322A474J035AS       | 0.5                        | 3                                                  | CX05M474K<br>CX05M474M                            | T323A474K035AS<br>T323A474M035AS |
| 0.47                                                      | A            | 10                             | T322A474K035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.47                                                      | A            | 20                             | T322A474M035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.56                                                      | B            | 5                              | T322B564J035AS       | 0.5                        | 3                                                  | CX01M564K<br>CX01M564M                            | T323B564K035AS<br>T323B564M035AS |
| 0.56                                                      | B            | 10                             | T322B564K035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.56                                                      | B            | 20                             | T322B564M035AS       | 0.5                        | 3                                                  | CX01M684K<br>CX01M684M                            | T323B684K035AS<br>T323B684M035AS |
| 0.68                                                      | B            | 5                              | T322B684J035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.68                                                      | B            | 10                             | T322B684K035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.68                                                      | B            | 20                             | T322B684M035AS       | 0.5                        | 3                                                  | CX01M824K<br>CX01M824M                            | T323B824K035AS<br>T323B824M035AS |
| 0.82                                                      | B            | 5                              | T322B824J035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.82                                                      | B            | 10                             | T322B824K035AS       | 0.5                        | 3                                                  | CX01M105K<br>CX01M105M                            | T323B105K035AS<br>T323B105M035AS |
| 0.82                                                      | B            | 20                             | T322B824M035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.0                                                       | B            | 5                              | T322B105J035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.0                                                       | B            | 10                             | T322B105K035AS       | 0.5                        | 3                                                  | CX01M125K<br>CX01M125M                            | T323B125K035AS<br>T323B125M035AS |
| 1.0                                                       | B            | 20                             | T322B105M035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.2                                                       | B            | 5                              | T322B125J035AS       | 0.5                        | 3                                                  | CX05M155K<br>CX05M155M                            | T323B155K035AS<br>T323B155M035AS |
| 1.2                                                       | B            | 10                             | T322B125K035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.2                                                       | B            | 20                             | T322B125M035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.5                                                       | B            | 5                              | T322B155J035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.5                                                       | B            | 10                             | T322B155K035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.5                                                       | B            | 20                             | T322B155M035AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.8                                                       | C            | 5,10,20                        | T322C185(1)035AS     | 0.5                        | 3                                                  | CX05M335K<br>CX05M335M                            | T323C335K035AS<br>T323C335M035AS |
| 2.2                                                       | C            | 5,10,20                        | T322C225(1)035AS     | 0.6                        | 3                                                  |                                                   |                                  |
| 2.7                                                       | C            | 5,10,20                        | T322C275(1)035AS     | 0.8                        | 3                                                  |                                                   |                                  |
| 3.3                                                       | C            | 5                              | T322C335J035AS       | 0.9                        | 4                                                  |                                                   |                                  |
| 3.3                                                       | C            | 10                             | T322C335K035AS       | 0.9                        | 4                                                  |                                                   |                                  |
| 3.3                                                       | C            | 20                             | T322C335M035AS       | 0.9                        | 4                                                  |                                                   |                                  |
| 3.9                                                       | C            | 5                              | T322C395J035AS       | 1.1                        | 4                                                  |                                                   |                                  |
| 3.9                                                       | C            | 10                             | T322C395K035AS       | 1.1                        | 4                                                  |                                                   |                                  |
| 3.9                                                       | C            | 20                             | T322C395M035AS       | 1.1                        | 4                                                  |                                                   |                                  |
| 4.7                                                       | C            | 5                              | T322C475J035AS       | 1.3                        | 4                                                  |                                                   |                                  |
| 4.7                                                       | C            | 10                             | T322C475K035AS       | 1.3                        | 4                                                  | CX05M475K<br>CX05M475M                            | T323C475K035AS<br>T323C475M035AS |
| 4.7                                                       | C            | 20                             | T322C475M035AS       | 1.3                        | 4                                                  |                                                   |                                  |

(1) To complete KEMET Part Number, insert Capacitance Tolerance Symbol as follows: M — ±20%, K — ±10%, J — ±5%  
**Bold Face** lines indicate preferred part types and values.



# TANTALUM MOLDED / AXIAL — MIL-PRF-49137/1 & 5

## T322 & T323 (CX01 & CX05) SERIES

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>µF                                | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | KEMET T322 SERIES    |                            |                                                    | CX01 & CX05 CAPACITORS<br>PER MIL-PRF-49137/1 & 5 |                                  |
|--------------------------------------------------|--------------|--------------------------------|----------------------|----------------------------|----------------------------------------------------|---------------------------------------------------|----------------------------------|
|                                                  |              |                                | KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>µA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MILITARY<br>PART NUMBER                           | KEMET<br>PART NUMBER             |
|                                                  |              |                                |                      |                            |                                                    |                                                   |                                  |
| 35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C |              |                                |                      |                            |                                                    |                                                   |                                  |
| 5.6                                              | D            | 5,10,20                        | T322D565(1)035AS     | 1.6                        | 4                                                  | CX05M685K<br>CX05M685M                            | T323D685K035AS<br>T323D685M035AS |
| 6.8                                              | D            | 5                              | T322D685J035AS       | 1.9                        | 4                                                  |                                                   |                                  |
| 6.8                                              | D            | 10                             | T322D685K035AS       | 1.9                        | 4                                                  |                                                   |                                  |
| 6.8                                              | D            | 20                             | T322D685M035AS       | 1.9                        | 4                                                  |                                                   |                                  |
| 8.2                                              | D            | 5,10,20                        | T322D825(1)035AS     | 2.3                        | 4                                                  | CX05M106K<br>CX05M106M                            | T323D106K035AS<br>T323D106M035AS |
| 10.0                                             | D            | 5                              | T322D106J035AS       | 2.8                        | 4                                                  |                                                   |                                  |
| 10.0                                             | D            | 10                             | T322D106K035AS       | 2.8                        | 4                                                  |                                                   |                                  |
| 10.0                                             | D            | 20                             | T322D106M035AS       | 2.8                        | 4                                                  |                                                   |                                  |
| 12.0                                             | E            | 5,10,20                        | T322E126(1)035AS     | 3.3                        | 4                                                  |                                                   |                                  |
| 15.0                                             | E            | 5,10,20                        | T322E156(1)035AS     | 4.2                        | 6                                                  |                                                   |                                  |
| 18.0                                             | E            | 5,10,20                        | T322E186(1)035AS     | 5.0                        | 6                                                  |                                                   |                                  |
| 22.0                                             | E            | 5,10,20                        | T322E226(1)035AS     | 6.2                        | 6                                                  |                                                   |                                  |
| 27.0                                             | E            | 5,10,20                        | T322E276(1)035AS     | 7.5                        | 6                                                  |                                                   |                                  |
| 33.0                                             | E            | 5,10,20                        | T322E336(1)035AS     | 9.2                        | 6                                                  |                                                   |                                  |
| 39.0                                             | F            | 5,10,20                        | T322F396(1)035AS     | 10.0                       | 6                                                  |                                                   |                                  |
| 47.0                                             | F            | 5,10,20                        | T322F476(1)035AS     | 10.0                       | 6                                                  |                                                   |                                  |
| 50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C |              |                                |                      |                            |                                                    |                                                   |                                  |
| 0.1                                              | A            | 5                              | T322A104J050AS       | 0.5                        | 3                                                  | CX05N104K<br>CX05N104M                            | T323A104K050AS<br>T323A104M050AS |
| 0.1                                              | A            | 10                             | T322A104K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.1                                              | A            | 20                             | T322A104M050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.12                                             | A            | 5,10,20                        | T322A124(1)050AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.15                                             | A            | 5                              | T322A154J050AS       | 0.5                        | 3                                                  | CX05N154K<br>CX05N154M                            | T323A154K050AS<br>T323A154M050AS |
| 0.15                                             | A            | 10                             | T322A154K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.15                                             | A            | 20                             | T322A154M050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.18                                             | A            | 5,10,20                        | T322A184(1)050AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.22                                             | A            | 5                              | T322A224J050AS       | 0.5                        | 3                                                  | CX05N224K<br>CX05N224M                            | T323A224K050AS<br>T323A224M050AS |
| 0.22                                             | A            | 10                             | T322A224K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.22                                             | A            | 20                             | T322A224M050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.27                                             | A            | 5,10,20                        | T322A274(1)050AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.33                                             | B            | 5                              | T322B334J050AS       | 0.5                        | 3                                                  | CX05N334K<br>CX05N334M                            | T323B334K050AS<br>T323B334M050AS |
| 0.33                                             | B            | 10                             | T322B334K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.33                                             | B            | 20                             | T322B334M050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.39                                             | B            | 5                              | T322B394J050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.39                                             | B            | 10                             | T322B394K050AS       | 0.5                        | 3                                                  | CX05N394K<br>CX05N394M                            | T323B394K050AS<br>T323B394M050AS |
| 0.39                                             | B            | 20                             | T322B394M050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.47                                             | B            | 5                              | T322B474J050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.47                                             | B            | 10                             | T322B474K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.47                                             | B            | 20                             | T322B474M050AS       | 0.5                        | 3                                                  | CX05N474K<br>CX05N474M                            | T323B474K050AS<br>T323B474M050AS |
| 0.56                                             | B            | 5,10,20                        | T322B564(1)050AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 0.68                                             | B            | 5                              | T322B684J050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.68                                             | B            | 10                             | T322B684K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 0.68                                             | B            | 20                             | T322B684M050AS       | 0.5                        | 3                                                  | CX05N684K<br>CX05N684M                            | T323B684K050AS<br>T323B684M050AS |
| 0.82                                             | B            | 5,10,20                        | T322B824(1)050AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 1.0                                              | B            | 5                              | T322B105J050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.0                                              | B            | 10                             | T322B105K050AS       | 0.5                        | 3                                                  |                                                   |                                  |
| 1.0                                              | B            | 20                             | T322B105M050AS       | 0.5                        | 3                                                  | CX05N105K<br>CX05N105M                            | T323B105K050AS<br>T323B105M050AS |
| 1.2                                              | C            | 5,10,20                        | T322C125(1)050AS     | 0.5                        | 3                                                  |                                                   |                                  |
| 1.5                                              | C            | 5                              | T322C155J050AS       | 0.6                        | 4                                                  |                                                   |                                  |
| 1.5                                              | C            | 10                             | T322C155K050AS       | 0.6                        | 4                                                  |                                                   |                                  |
| 1.5                                              | C            | 20                             | T322C155M050AS       | 0.6                        | 4                                                  | CX05N155K<br>CX05N155M                            | T323C155K050AS<br>T323C155M050AS |
| 1.8                                              | C            | 5,10,20                        | T322C185(1)050AS     | 0.7                        | 4                                                  |                                                   |                                  |
| 2.2                                              | C            | 5                              | T322C225J050AS       | 0.9                        | 4                                                  |                                                   |                                  |
| 2.2                                              | C            | 10                             | T322C225K050AS       | 0.9                        | 4                                                  |                                                   |                                  |
| 2.2                                              | C            | 20                             | T322C225M050AS       | 0.9                        | 4                                                  | CX05N225K<br>CX05N225M                            | T323C225K050AS<br>T323C225M050AS |
| 2.7                                              | D            | 5,10,20                        | T322D275(1)050AS     | 1.1                        | 4                                                  |                                                   |                                  |
| 3.3                                              | D            | 5                              | T322D335J050AS       | 1.3                        | 4                                                  |                                                   |                                  |
| 3.3                                              | D            | 10                             | T322D335K050AS       | 1.3                        | 4                                                  |                                                   |                                  |
| 3.3                                              | D            | 20                             | T322D335M050AS       | 1.3                        | 4                                                  | CX05N335K<br>CX05N335M                            | T323D335K050AS<br>T323D335M050AS |
| 3.9                                              | D            | 5,10,20                        | T322D395(1)050AS     | 1.6                        | 4                                                  |                                                   |                                  |
| 4.7                                              | D            | 5                              | T322D475J050AS       | 1.9                        | 4                                                  |                                                   |                                  |
| 4.7                                              | D            | 10                             | T322D475K050AS       | 1.9                        | 4                                                  |                                                   |                                  |
| 4.7                                              | D            | 20                             | T322D475M050AS       | 1.9                        | 4                                                  | CX05N475K<br>CX05N475M                            | T323D475K050AS<br>T323D475M050AS |
| 5.6                                              | E            | 5,10,20                        | T322E565(1)050AS     | 2.2                        | 4                                                  |                                                   |                                  |
| 6.8                                              | E            | 5,10,20                        | T322E685(1)050AS     | 2.7                        | 4                                                  |                                                   |                                  |
| 8.2                                              | E            | 5,10,20                        | T322E825(1)050AS     | 3.2                        | 4                                                  |                                                   |                                  |
| 10.0                                             | E            | 5,10,20                        | T322E106(1)050AS     | 4.0                        | 6                                                  |                                                   |                                  |
| 12.0                                             | F            | 5,10,20                        | T322F126(1)050AS     | 4.8                        | 6                                                  |                                                   |                                  |
| 15.0                                             | F            | 5,10,20                        | T322F156(1)050AS     | 6.0                        | 6                                                  |                                                   |                                  |
| 18.0                                             | F            | 5,10,20                        | T322F186(1)050AS     | 7.2                        | 6                                                  |                                                   |                                  |
| 22.0                                             | F            | 5,10,20                        | T322F226(1)050AS     | 8.8                        | 6                                                  |                                                   |                                  |

(1) To complete KEMET Part Number, insert Capacitance Tolerance Symbol as follows: M — ±20%, K — ±10%, J — ±5%  
**Bold Face** lines indicate preferred part types and values.

### T330 Series

KEMET T330 Series, polar-type, radial lead rectangular Precision Molded Tantalum (PMT) capacitors are primarily designed for applications that demand full use of the premium space available in printed circuitry and high density packaging. Compact, space saving T330 Series capacitors provide superior packing factor and space utilization compared with tubular units of the same microcoulomb (CV) rating.

T330 Series capacitors employ a rectangular sintered, dry tantalum anode, transfer molded in precision dies with a high impact resistant plastic having excellent electrical, physical, and moisture resistant properties. All cases utilize gold color plastic which permits laser marking with outstanding permanency and legibility. The polarity is indicated by a + sign permanently marked on the case. The radius on the two vertical edges at the positive end of B, C, and D Cases can be used as a sensing dimension for automatic insertion processes.

### T340 Series

The compact space saving T340 Series is transfer molded in precision dies with a high impact resistant plastic having excellent electrical, physical, and moisture resistant properties. The gold color plastic case utilized permits laser marking with outstanding permanency and legibility.

Marking is provided on the top of the case to allow visual inspection for proper polarity and placement after insertion. In addition, positive polarity identification is achieved by an easily recognized molded radius on the positive end of the case. This physical polarity identification is readily observed after capacitor placement as a further aid to the top marking in prevention of possible reverse insertion.

The location of the standoffs may serve a similar sensing function for the A Case. These standoffs, located in the base of all case sizes, provide vents for air circulation and also allow easy removal of flux residues from leadwire and circuit board solder joints.

T330 Series capacitors are highly reliable and exhibit performance characteristics typical of military test standards. They are available in capacitance values ranging from 0.1 to 220 microfarads in  $\pm 20$ ,  $\pm 10$ ,  $\pm 5\%$  tolerance levels, and in working voltages from 6 to 50 volts. At 85°C the capacitors will operate continuously at full rated voltage. They are rated to 125°C when operated at 2/3 of nameplate voltage. In addition, they feature exceptionally low DC leakage and Dissipation Factor characteristics.

They are ideal for bypass, coupling, and timing applications in computers, military ordinance, industrial, entertainment, and consumer electronic equipment.

Standoffs, located in the base of all case sizes, provide vents for air circulation and also allow easy removal of flux residues from leadwire and circuit board solder joints. With very low impedance and ESR values, the T340 Series features exceptionally low DC leakage and DF characteristics. The T340 Series is available in standard  $\pm 20\%$ ;  $\pm 10\%$ ;  $\pm 5\%$  (special order) capacitance tolerance.

T340 Series capacitors are highly reliable and exhibit performance characteristics typical of military test standards.

## PERFORMANCE CHARACTERISTICS

- **CAPACITANCE/VOLTAGE RANGE:**  
 T330: 0.1-220 $\mu$ F, 6-50 Volts.  
 T340: 0.1-330 $\mu$ F, 6-50 Volts.
- **CAPACITANCE TOLERANCE:** Available in standard EIA nominal values with  $\pm 20\%$  tolerance standard,  $\pm 10\%$  and  $\pm 5\%$  available on special order.
- **DISSIPATION FACTOR:** Maximum DF limits are shown in corresponding series part number listing. See Application Notes Section, page 78.
- **DC LEAKAGE CURRENT:** Maximum leakage values at 25°C are shown in part number listings, pages 51, 52, 55, 56 and 57. See Application Notes Section, page 76.
- **RATED VOLTAGE; WORKING VOLTAGE; SURGE VOLTAGE; REVERSE VOLTAGE:** See Application Notes Section, pages 76 & 77 for description.
- **IMPEDANCE and ESR:** See Application Notes Section, page 77 & 78 for additional information. Reference ESR values are shown in table below.
- **AC RIPPLE VOLTAGE:** Permissible AC ripple voltage is related to ESR of the capacitor and the power dissipation capabilities of a particular case size. Thermal capacities for the various case sizes have been determined and are listed in Table below. For additional description see page 78.

### T330/T340 ESR (OHMS) at 100 kHz @ +25°C

(The ESR values provided below are for reference only.  
 No warranty, as stated on page 3 and reincorporated here, is made as to the accuracy of these values for any particular T330/T340 Series product.)

| Cap.<br>$\mu$ F | 6<br>Volt | 10<br>Volt | 15<br>Volt | 20<br>Volt | 25<br>Volt | 35<br>Volt | 50<br>Volt |
|-----------------|-----------|------------|------------|------------|------------|------------|------------|
| 0.10            |           |            |            |            |            | 26.0       | 26.0       |
| 0.15            |           |            |            |            |            | 21.0       | 21.0       |
| 0.22            |           |            |            |            |            | 17.0       | 17.0       |
| 0.33            |           |            |            |            |            | 15.0       | 15.0       |
| 0.47            |           |            |            |            |            | 13.0       | 13.0       |
| 0.68            |           |            |            |            |            | 10.0       | 10.0       |
| 1.00            |           |            |            |            |            | 8.0        | 8.0        |
| 1.50            |           |            |            |            | 8.0        | 6.0        | 5.0        |
| 2.20            |           |            |            | 7.0        | 6.0        | 5.0        | 3.5        |
| 3.30            |           |            | 6.0        | 5.5        | 5.0        | 4.0        | 3.0        |
| 4.70            |           | 8.0        | 5.0        | 4.5        | 4.0        | 3.0        | 2.5        |
| 6.80            | 8.0       | 6.0        | 4.0        | 3.6        | 3.1        | 2.5        | 2.0        |
| 10.0            | 6.0       | 5.0        | 3.2        | 2.9        | 2.5        | 2.0        | 1.6        |
| 15.0            | 5.0       | 3.7        | 2.5        | 2.3        | 2.0        | 1.6        | 1.2        |
| 22.0            | 3.7       | 2.7        | 2.0        | 1.8        | 1.5        | 1.3        | 1.0        |
| 33.0            | 3.0       | 2.1        | 1.6        | 1.4        | 1.2        | 1.0        |            |
| 47.0            | 2.0       | 1.7        | 1.3        | 1.2        | 1.0        | 0.8        |            |
| 68.0            | 1.8       | 1.3        | 1.0        | 0.9        | 0.8        |            |            |
| 100.0           | 1.6       | 1.0        | 0.8        | 0.6        |            |            |            |
| 150.0           | 0.9       | 0.8        | 0.6        |            |            |            |            |
| 220.0           | 0.9       | 0.6        |            |            |            |            |            |
| 330.0           | 0.7       |            |            |            |            |            |            |

| Series    | Case Size | Watts |
|-----------|-----------|-------|
| T330/T340 | A         | .09   |
|           | B         | .09   |
|           | C         | .100  |
| T330      | D         | .125  |
| T340 only | D/F       | .125  |
|           | E         | .180  |

**Maximum Power Dissipation: 25°C Ambient**

- **ENVIRONMENTAL CONSIDERATIONS:**
  - A. Shock Test: MIL-STD-202, Method 213.
  - B. Thermal Shock, MIL-STD-202, Method 107.
  - C. Moisture Resistance: MIL-STD-202, Method 106.
  - D. Solderability: MIL-STD-202, Method 208.
 For additional Environmental Test Information see pages 80, 81 and 82.
- **LEAD MATERIAL:** Solder coated steel core with copper ply per MIL-STD-1276.
- **LEAD TAPE and REEL:** Reeling per specification RS-468. See pages 71 and 73 for additional information.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES & (MILLIMETERS)

| CASE SIZE | H CASE HEIGHT                | W CASE WIDTH                  | T CASE THICKNESS             | E CASE TO WIRE               | S LEAD SPACING               |
|-----------|------------------------------|-------------------------------|------------------------------|------------------------------|------------------------------|
| A         | .345 ± .008<br>(8.76 ± .203) | .230 ± .005<br>(5.84 ± .127)  | .105 ± .005<br>(2.67 ± .127) | .050 ± .010<br>(1.27 ± .25)  | .125 ± .005<br>(3.18 ± .127) |
| B         | .225 ± .015<br>(5.71 ± 0.38) | .285 ± .015<br>(7.24 ± 0.38)  | .170 ± .015<br>(4.32 ± 0.38) | .042 ± .010<br>(1.07 ± .25)  | .200 ± .005<br>(5.08 ± .127) |
| C         | .325 ± .015<br>(8.26 ± 0.38) | .325 ± .015<br>(8.26 ± 0.38)  | .170 ± .015<br>(4.32 ± 0.38) | .062 ± .010<br>(1.57 ± 0.25) | .200 ± .005<br>(5.08 ± .127) |
| D         | .375 ± .015<br>(9.53 ± 0.38) | .600 ± .015<br>(15.24 ± 0.38) | .195 ± .015<br>(4.95 ± 0.38) | .200 ± .010<br>(5.08 ± 0.25) | .200 ± .005<br>(5.08 ± .127) |

### ORDERING INFORMATION



**\*Part Number Example: T330B104M035AS (14 digits – no spaces)**

### MARKING INFORMATION



## RATINGS & PART NUMBER REFERENCE

### A CASE

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | KEMET PART NUMBER       | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------|--------------|-------------------------|----------------------------|---------------------------------------------------|
| <b>6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C</b>   |              |                         |                            |                                                   |
| 18.0                                                    | A            | T330A186(1)006AS        | 1                          | 6                                                 |
| <b>22.0</b>                                             | <b>A</b>     | <b>T330A226(1)006AS</b> | <b>1</b>                   | <b>6</b>                                          |
| <b>10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C</b>  |              |                         |                            |                                                   |
| <b>10.0</b>                                             | <b>A</b>     | <b>T330A106(1)010AS</b> | <b>1</b>                   | <b>6</b>                                          |
| 12.0                                                    | A            | T330A126(1)010AS        | 1                          | 6                                                 |
| 15.0                                                    | A            | T330A156(1)010AS        | 1                          | 6                                                 |
| <b>15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C</b> |              |                         |                            |                                                   |
| 8.2                                                     | A            | T330A825(1)015AS        | 1                          | 6                                                 |
| <b>20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C</b> |              |                         |                            |                                                   |
| 5.6                                                     | A            | T330A565(1)020AS        | 1                          | 6                                                 |
| <b>6.8</b>                                              | <b>A</b>     | <b>T330A685(1)020AS</b> | <b>1</b>                   | <b>6</b>                                          |
| <b>25 VOLT RATING AT 85°C — 17 VOLT RATING AT 125°C</b> |              |                         |                            |                                                   |
| 3.3                                                     | A            | T330A335(1)025AS        | 1                          | 4                                                 |
| 3.9                                                     | A            | T330A395(1)025AS        | 1                          | 4                                                 |
| <b>4.7</b>                                              | <b>A</b>     | <b>T330A475(1)025AS</b> | <b>1</b>                   | <b>4</b>                                          |
| <b>35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C</b> |              |                         |                            |                                                   |
| 0.10                                                    | A            | T330A104(1)035AS        | 1                          | 3                                                 |
| 0.12                                                    | A            | T330A124(1)035AS        | 1                          | 3                                                 |
| 0.15                                                    | A            | T330A154(1)035AS        | 1                          | 3                                                 |
| 0.18                                                    | A            | T330A184(1)035AS        | 1                          | 3                                                 |
| 0.22                                                    | A            | T330A224(1)035AS        | 1                          | 3                                                 |
| 0.27                                                    | A            | T330A274(1)035AS        | 1                          | 3                                                 |
| 0.33                                                    | A            | T330A334(1)035AS        | 1                          | 3                                                 |

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | KEMET PART NUMBER       | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------|--------------|-------------------------|----------------------------|---------------------------------------------------|
| <b>35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C</b> |              |                         |                            |                                                   |
| 0.39                                                    | A            | T330A394(1)035AS        | 1                          | 3                                                 |
| 0.47                                                    | A            | T330A474(1)035AS        | 1                          | 3                                                 |
| 0.56                                                    | A            | T330A564(1)035AS        | 1                          | 3                                                 |
| 0.68                                                    | A            | T330A684(1)035AS        | 1                          | 3                                                 |
| 0.82                                                    | A            | T330A824(1)035AS        | 1                          | 3                                                 |
| <b>1.0</b>                                              | <b>A</b>     | <b>T330A105(1)035AS</b> | <b>1</b>                   | <b>3</b>                                          |
| 1.2                                                     | A            | T330A125(1)035AS        | 1                          | 4                                                 |
| 1.5                                                     | A            | T330A155(1)035AS        | 1                          | 4                                                 |
| 1.8                                                     | A            | T330A185(1)035AS        | 1                          | 4                                                 |
| 2.2                                                     | A            | T330A225(1)035AS        | 1                          | 4                                                 |
| <b>2.7</b>                                              | <b>A</b>     | <b>T330A275(1)035AS</b> | <b>1</b>                   | <b>4</b>                                          |
| <b>50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C</b> |              |                         |                            |                                                   |
| 0.10                                                    | A            | T330A104(1)050AS        | 1                          | 3                                                 |
| 0.12                                                    | A            | T330A124(1)050AS        | 1                          | 3                                                 |
| 0.15                                                    | A            | T330A154(1)050AS        | 1                          | 3                                                 |
| 0.18                                                    | A            | T330A184(1)050AS        | 1                          | 3                                                 |
| 0.22                                                    | A            | T330A224(1)050AS        | 1                          | 3                                                 |
| 0.27                                                    | A            | T330A274(1)050AS        | 1                          | 3                                                 |
| 0.33                                                    | A            | T330A334(1)050AS        | 1                          | 3                                                 |
| 0.39                                                    | A            | T330A394(1)050AS        | 1                          | 3                                                 |
| 0.47                                                    | A            | T330A474(1)050AS        | 1                          | 3                                                 |
| 0.56                                                    | A            | T330A564(1)050AS        | 1                          | 3                                                 |
| 0.68                                                    | A            | T330A684(1)050AS        | 1                          | 3                                                 |
| 0.82                                                    | A            | T330A824(1)050AS        | 1                          | 4                                                 |
| 1.0                                                     | A            | T330A105(1)050AS        | 1                          | 4                                                 |
| 1.2                                                     | A            | T330A125(1)050AS        | 1                          | 4                                                 |
| 1.5                                                     | A            | T330A155(1)050AS        | 1                          | 4                                                 |

### B, C & D CASES

| CAPACITANCE<br>μF                                      | CASE<br>SIZE | KEMET PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|--------------------------------------------------------|--------------|-------------------|----------------------------|---------------------------------------------------|
| <b>6 VOLT RATING AT 85°C — 4 VOLT RATING AT 125°C</b>  |              |                   |                            |                                                   |
| 10.0                                                   | B            | T330B106(1)006AS  | 1                          | 6                                                 |
| 12.0                                                   | B            | T330B126(1)006AS  | 1                          | 6                                                 |
| 15.0                                                   | B            | T330B156(1)006AS  | 1                          | 6                                                 |
| 18.0                                                   | B            | T330B186(1)006AS  | 1                          | 6                                                 |
| 22.0                                                   | B            | T330B226(1)006AS  | 1                          | 6                                                 |
| 27.0                                                   | C            | T330C276(1)006AS  | 1                          | 6                                                 |
| 33.0                                                   | C            | T330C336(1)006AS  | 1                          | 6                                                 |
| 39.0                                                   | C            | T330C396(1)006AS  | 1                          | 6                                                 |
| 47.0                                                   | C            | T330C476(1)006AS  | 2                          | 6                                                 |
| 56.0                                                   | C            | T330C566(1)006AS  | 5                          | 6                                                 |
| 68.0                                                   | C            | T330C686(1)006AS  | 5                          | 6                                                 |
| 82.0                                                   | D            | T330D826(1)006AS  | 5                          | 6                                                 |
| 100.0                                                  | D            | T330D107(1)006AS  | 5                          | 6                                                 |
| 120.0                                                  | D            | T330D127(1)006AS  | 5                          | 6                                                 |
| 150.0                                                  | D            | T330D157(1)006AS  | 5                          | 6                                                 |
| 180.0                                                  | D            | T330D187(1)006AS  | 10                         | 6                                                 |
| 220.0                                                  | D            | T330D227(1)006AS  | 10                         | 8                                                 |
| <b>10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C</b> |              |                   |                            |                                                   |
| 5.6                                                    | B            | T330B565(1)010AS  | 1                          | 6                                                 |
| 6.8                                                    | B            | T330B685(1)010AS  | 1                          | 6                                                 |
| 8.2                                                    | B            | T330B825(1)010AS  | 1                          | 6                                                 |
| 10.0                                                   | B            | T330B106(1)010AS  | 1                          | 6                                                 |
| 12.0                                                   | B            | T330B126(1)010AS  | 1                          | 6                                                 |
| 15.0                                                   | B            | T330B156(1)010AS  | 1                          | 6                                                 |
| 18.0                                                   | C            | T330C186(1)010AS  | 1                          | 6                                                 |
| 22.0                                                   | C            | T330C226(1)010AS  | 2                          | 6                                                 |
| 27.0                                                   | C            | T330C276(1)010AS  | 2                          | 6                                                 |

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | KEMET PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------|--------------|-------------------|----------------------------|---------------------------------------------------|
| <b>10 VOLT RATING AT 85°C — 7 VOLT RATING AT 125°C</b>  |              |                   |                            |                                                   |
| 33.0                                                    | C            | T330C336(1)010AS  | 2                          | 6                                                 |
| 39.0                                                    | C            | T330C396(1)010AS  | 5                          | 6                                                 |
| 47.0                                                    | D            | T330D476(1)010AS  | 5                          | 6                                                 |
| 56.0                                                    | D            | T330D566(1)010AS  | 5                          | 6                                                 |
| 68.0                                                    | D            | T330D686(1)010AS  | 5                          | 6                                                 |
| 82.0                                                    | D            | T330D826(1)010AS  | 5                          | 6                                                 |
| 100.0                                                   | D            | T330D107(1)010AS  | 10                         | 6                                                 |
| 120.0                                                   | D            | T330D127(1)010AS  | 10                         | 6                                                 |
| 150.0                                                   | D            | T330D157(1)010AS  | 10                         | 6                                                 |
| <b>15 VOLT RATING AT 85°C — 10 VOLT RATING AT 125°C</b> |              |                   |                            |                                                   |
| 3.9                                                     | B            | T330B395(1)015AS  | 1                          | 6                                                 |
| 4.7                                                     | B            | T330B475(1)015AS  | 1                          | 6                                                 |
| 5.6                                                     | B            | T330B565(1)015AS  | 1                          | 6                                                 |
| 6.8                                                     | B            | T330B685(1)015AS  | 1                          | 6                                                 |
| 8.2                                                     | B            | T330B825(1)015AS  | 1                          | 6                                                 |
| 10.0                                                    | C            | T330C106(1)015AS  | 1                          | 6                                                 |
| 12.0                                                    | C            | T330C126(1)015AS  | 1                          | 6                                                 |
| 15.0                                                    | C            | T330C156(1)015AS  | 2                          | 6                                                 |
| 18.0                                                    | C            | T330C186(1)015AS  | 5                          | 6                                                 |
| 22.0                                                    | C            | T330C226(1)015AS  | 5                          | 6                                                 |
| 27.0                                                    | C            | T330C276(1)015AS  | 5                          | 6                                                 |
| 33.0                                                    | C            | T330C336(1)015AS  | 5                          | 6                                                 |
| 39.0                                                    | D            | T330D396(1)015AS  | 10                         | 6                                                 |
| 47.0                                                    | D            | T330D476(1)015AS  | 10                         | 6                                                 |
| 56.0                                                    | D            | T330D566(1)015AS  | 10                         | 6                                                 |
| 68.0                                                    | D            | T330D686(1)015AS  | 10                         | 6                                                 |
| 82.0                                                    | D            | T330D826(1)015AS  | 10                         | 6                                                 |

(1) To complete Part Number insert Capacitance Tolerance Symbol in the 9th character, M — ±20%, K — ±10%, J — ±5%.

**Bold face** lines indicate popular part types and values.

Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET'S option.



# TANTALUM MOLDED / RADIAL

## T330 SERIES - PRECISION MOLDED - RADIAL LEADS

### B, C & D CASES (Cont'd)

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | KEMET PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------|--------------|-------------------|----------------------------|---------------------------------------------------|
| <b>25 VOLT RATING AT 85°C — 17 VOLT RATING AT 125°C</b> |              |                   |                            |                                                   |
| 2.7                                                     | B            | T330B275(1)025AS  | 1                          | 6                                                 |
| 3.3                                                     | B            | T330B335(1)025AS  | 1                          | 6                                                 |
| 3.9                                                     | B            | T330B395(1)025AS  | 1                          | 6                                                 |
| 4.7                                                     | B            | T330B475(1)025AS  | 1                          | 6                                                 |
| 5.6                                                     | C            | T330C565(1)025AS  | 1                          | 6                                                 |
| 6.8                                                     | C            | T330C685(1)025AS  | 1                          | 6                                                 |
| 8.2                                                     | C            | T330C825(1)025AS  | 1                          | 6                                                 |
| 10.0                                                    | C            | T330C106(1)025AS  | 1                          | 6                                                 |
| 12.0                                                    | C            | T330C126(1)025AS  | 1                          | 6                                                 |
| 15.0                                                    | C            | T330C156(1)025AS  | 2                          | 6                                                 |
| 18.0                                                    | D            | T330D186(1)025AS  | 5                          | 6                                                 |
| 22.0                                                    | D            | T330D226(1)025AS  | 5                          | 6                                                 |
| 27.0                                                    | D            | T330D276(1)025AS  | 5                          | 6                                                 |
| 33.0                                                    | D            | T330D336(1)025AS  | 5                          | 6                                                 |
| 39.0                                                    | D            | T330D396(1)025AS  | 10                         | 6                                                 |
| 47.0                                                    | D            | T330D476(1)025AS  | 10                         | 6                                                 |
| <b>35 VOLT RATING AT 85°C—23 VOLT RATING AT 125°C</b>   |              |                   |                            |                                                   |
| 0.10                                                    | B            | T330B104(1)035AS  | 1                          | 6                                                 |
| 0.12                                                    | B            | T330B124(1)035AS  | 1                          | 6                                                 |
| 0.15                                                    | B            | T330B154(1)035AS  | 1                          | 6                                                 |
| 0.18                                                    | B            | T330B184(1)035AS  | 1                          | 6                                                 |
| 0.22                                                    | B            | T330B224(1)035AS  | 1                          | 6                                                 |
| 0.27                                                    | B            | T330B274(1)035AS  | 1                          | 6                                                 |
| 0.33                                                    | B            | T330B334(1)035AS  | 1                          | 6                                                 |
| 0.39                                                    | B            | T330B394(1)035AS  | 1                          | 6                                                 |
| 0.47                                                    | B            | T330B474(1)035AS  | 1                          | 6                                                 |
| 0.56                                                    | B            | T330B564(1)035AS  | 1                          | 6                                                 |
| 0.68                                                    | B            | T330B684(1)035AS  | 1                          | 6                                                 |
| 0.82                                                    | B            | T330B824(1)035AS  | 1                          | 6                                                 |
| 1.0                                                     | B            | T330B105(1)035AS  | 1                          | 6                                                 |
| 1.2                                                     | B            | T330B125(1)035AS  | 1                          | 6                                                 |
| 1.5                                                     | B            | T330B155(1)035AS  | 1                          | 6                                                 |
| 1.8                                                     | B            | T330B185(1)035AS  | 1                          | 6                                                 |
| 2.2                                                     | B            | T330B225(1)035AS  | 1                          | 6                                                 |
| 2.7                                                     | B            | T330B275(1)035AS  | 1                          | 6                                                 |
| 3.3                                                     | B            | T330B335(1)035AS  | 1                          | 6                                                 |
| 3.9                                                     | C            | T330C395(1)035AS  | 1                          | 6                                                 |
| 4.7                                                     | C            | T330C475(1)035AS  | 1                          | 6                                                 |
| 5.6                                                     | C            | T330C565(1)035AS  | 1                          | 6                                                 |

| CAPACITANCE<br>μF                                       | CASE<br>SIZE | KEMET PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------|--------------|-------------------|----------------------------|---------------------------------------------------|
| <b>35 VOLT RATING AT 85°C — 23 VOLT RATING AT 125°C</b> |              |                   |                            |                                                   |
| 6.8                                                     | C            | T330C685(1)035AS  | 2                          | 6                                                 |
| 8.2                                                     | C            | T330C825(1)035AS  | 5                          | 6                                                 |
| 10.0                                                    | C            | T330C106(1)035AS  | 5                          | 6                                                 |
| 12.0                                                    | D            | T330D126(1)035AS  | 5                          | 6                                                 |
| 15.0                                                    | D            | T330D156(1)035AS  | 5                          | 6                                                 |
| 18.0                                                    | D            | T330D186(1)035AS  | 10                         | 6                                                 |
| 22.0                                                    | D            | T330D226(1)035AS  | 10                         | 6                                                 |
| 27.0                                                    | D            | T330D276(1)035AS  | 10                         | 6                                                 |
| 33.0                                                    | D            | T330D336(1)035AS  | 10                         | 6                                                 |
| <b>50 VOLT RATING AT 85°C—33 VOLT RATING AT 125°C</b>   |              |                   |                            |                                                   |
| 0.10                                                    | B            | T330B104(1)050AS  | 1                          | 6                                                 |
| 0.12                                                    | B            | T330B124(1)050AS  | 1                          | 6                                                 |
| 0.15                                                    | B            | T330B154(1)050AS  | 1                          | 6                                                 |
| 0.18                                                    | B            | T330B184(1)050AS  | 1                          | 6                                                 |
| 0.22                                                    | B            | T330B224(1)050AS  | 1                          | 6                                                 |
| 0.27                                                    | B            | T330B274(1)050AS  | 1                          | 6                                                 |
| 0.33                                                    | B            | T330B334(1)050AS  | 1                          | 6                                                 |
| 0.39                                                    | B            | T330B394(1)050AS  | 1                          | 6                                                 |
| 0.47                                                    | B            | T330B474(1)050AS  | 1                          | 6                                                 |
| 0.56                                                    | B            | T330B564(1)050AS  | 1                          | 6                                                 |
| 0.68                                                    | B            | T330B684(1)050AS  | 1                          | 6                                                 |
| 0.82                                                    | B            | T330B824(1)050AS  | 1                          | 6                                                 |
| 1.0                                                     | B            | T330B105(1)050AS  | 1                          | 6                                                 |
| 1.2                                                     | B            | T330B125(1)050AS  | 1                          | 6                                                 |
| 1.5                                                     | B            | T330B155(1)050AS  | 1                          | 6                                                 |
| 1.8                                                     | B            | T330B185(1)050AS  | 1                          | 6                                                 |
| 2.2                                                     | B            | T330B225(1)050AS  | 1                          | 6                                                 |
| 2.7                                                     | C            | T330C275(1)050AS  | 1                          | 6                                                 |
| 3.3                                                     | C            | T330C335(1)050AS  | 2                          | 6                                                 |
| 3.9                                                     | C            | T330C395(1)050AS  | 5                          | 6                                                 |
| 4.7                                                     | C            | T330C475(1)050AS  | 5                          | 6                                                 |
| 5.6                                                     | C            | T330C565(1)050AS  | 5                          | 6                                                 |
| 6.8                                                     | D            | T330D685(1)050AS  | 5                          | 6                                                 |
| 8.2                                                     | D            | T330D825(1)050AS  | 5                          | 6                                                 |
| 10.0                                                    | D            | T330D106(1)050AS  | 5                          | 6                                                 |
| 12.0                                                    | D            | T330D126(1)050AS  | 5                          | 6                                                 |
| 15.0                                                    | D            | T330D156(1)050AS  | 10                         | 6                                                 |
| 18.0                                                    | D            | T330D186(1)050AS  | 10                         | 6                                                 |

(1) To complete Part Number insert Capacitance Tolerance Symbol in the 9th character, M — ±20%, K — ±10%, J — ±5%.

**Bold face** lines indicate popular part types and values.

Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET'S option.

# TANTALUM MOLDED / RADIAL

## T340 SERIES - PRECISION MOLDED - RADIAL LEADS



Effective September 30, 2005, the KEMET T340 Series is RoHS compliant.

### CAPACITOR OUTLINE DRAWINGS



T340 Series Tantalum Molded / Radial

### DIMENSIONS — INCHES & MILLIMETERS

| CASE SIZE | H** (MAX) |      | W (MAX) |      | T (MAX) |      | LEAD SPACING S |      | LEAD LENGTH L |      | LEAD DIAMETER D |      |
|-----------|-----------|------|---------|------|---------|------|----------------|------|---------------|------|-----------------|------|
|           | H         |      | W       |      | T       |      | Inches         | mm   | Inches        | mm   | Inches          | mm   |
|           | Inches    | mm   | Inches  | mm   | inches  | mm   | ±.020          | ±.5  | ±.078         | ±2.0 | ±.001           | ±.03 |
| A         | .287      | 7.3  | .185    | 4.7  | .165    | 4.2  | .100           | 2.5  | .600          | 15.0 | .020            | 0.50 |
| B         | .327      | 8.3  | .283    | 7.2  | .157    | 4.0  | .200           | 5.0  | .600          | 15.0 | .020            | 0.50 |
| C         | .413      | 10.5 | .287    | 7.3  | .169    | 4.3  | .200           | 5.0  | .600          | 15.0 | .020            | 0.50 |
| D         | .413      | 10.5 | .484    | 12.3 | .287    | 7.3  | .400           | 10.0 | .600          | 15.0 | .025            | 0.64 |
| E         | .413      | 10.5 | .484    | 12.3 | .484    | 12.3 | .400           | 10.0 | .600          | 15.0 | .025            | 0.64 |
| F         | .413      | 10.5 | .484    | 12.3 | .287    | 7.3  | .200           | 5.0  | .600          | 15.0 | .025            | 0.64 |

\*\*Includes Standoff Height of .015 ± .005" (.38 ± .13 mm) for All Case Sizes.

### ORDERING INFORMATION



\*Part Number Example: T340A105M035AS (14 digits – no spaces)

### MARKING INFORMATION

#### American



#### European



#### □ □ = DIN. Specification Date Code

Insert Date Code as follows:

- |                               |                                |
|-------------------------------|--------------------------------|
| □ 1st digit - represents year | □ 2nd digit - represents month |
| L - 2000                      | Q - 2005                       |
| M - 2001                      | R - 2006                       |
| N - 2002                      | S - 2007                       |
| O - 2003                      | T - 2008                       |
| P - 2004                      | U - 2009                       |
|                               | 1 - 9 for January - September  |
|                               | O for October                  |
|                               | N for November                 |
|                               | D for December                 |

**RATINGS & PART NUMBER REFERENCE**

| CAPACITANCE<br>μF                                       | CASE<br>SIZE                                  | KEMET<br>PART NUMBER                                                                                                                                          | MAX.<br>DC<br>LEAKAGE<br>μA@25°C                        | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MAX.<br>IMPEDANCE<br>Ω@<br>10 kHz |
|---------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------|-----------------------------------|
| <b>3 VOLT RATING AT 85°C — 2 VOLT AT 125°C</b>          |                                               |                                                                                                                                                               |                                                         |                                                    |                                   |
| 10.0<br>15.0                                            | A<br>A                                        | T340A106(1)003AS<br>T340A156(1)003AS                                                                                                                          | 1.0<br>1.0                                              | 6<br>6                                             | 6.0<br>3.2                        |
| 33.0<br>47.0                                            | B<br>B                                        | T340B336(1)003AS<br>T340B476(1)003AS                                                                                                                          | 1.5<br>3.0                                              | 6<br>6                                             | 2.1<br>1.8                        |
| 68.0<br>100.0                                           | C<br>C                                        | T340C686(1)003AS<br>T340C107(1)003AS                                                                                                                          | 4.0<br>5.0                                              | 6<br>6                                             | 1.5<br>1.2                        |
| <b>6/6.3 VOLT RATING AT 85°C — 4 VOLT AT 125°C</b>      |                                               |                                                                                                                                                               |                                                         |                                                    |                                   |
| 6.8                                                     | A                                             | T340A685(1)006AS                                                                                                                                              | 1.0                                                     | 6                                                  | 6.0                               |
| 10.0<br>12.0<br>15.0<br>18.0<br>22.0                    | B<br>B<br>B<br>B<br>B                         | T340B106(1)006AS<br>T340B126(1)006AS<br>T340B156(1)006AS<br>T340B186(1)006AS<br>T340B226(1)006AS                                                              | 1.0<br>1.0<br>1.0<br>1.0<br>2.5                         | 6<br>6<br>6<br>6<br>6                              | 2.1                               |
| 27.0<br>33.0<br>39.0<br>47.0<br>56.0<br>68.0            | C<br>C<br>C<br>C<br>C<br>C                    | T340C276(1)006AS<br>T340C336(1)006AS<br>T340C396(1)006AS<br><b>T340C476(1)006AS</b><br>T340C566(1)006AS<br>T340C686(1)006AS                                   | 2.5<br>2.5<br>2.5<br><b>3.0</b><br>5.0<br>5.0           | 6<br>6<br>6<br><b>6</b><br>6<br>6                  | 1.5                               |
| 82.0<br>100.0<br>120.0<br>150.0<br>180.0<br>220.0       | D/F<br>D/F<br>D/F<br>D/F<br>D/F<br>D/F        | T340(2)826(1)006AS<br>T340(2)107(1)006AS<br>T340(2)127(1)006AS<br>T340(2)157(1)006AS<br>T340(2)187(1)006AS<br>T340(2)227(1)006AS                              | 5.0<br>5.0<br>5.0<br>8.0<br>10.0<br>10.0                | 6<br>6<br>6<br>6<br>6<br>6                         | 0.8                               |
| 330.0                                                   | E                                             | T340E337(1)006AS                                                                                                                                              | 10.0                                                    | 8                                                  | 0.5                               |
| <b>10 VOLT RATING AT 85°C — 6 VOLT AT 125°C</b>         |                                               |                                                                                                                                                               |                                                         |                                                    |                                   |
| 4.7                                                     | A                                             | <b>T340A475(1)010AS</b>                                                                                                                                       | 1.0                                                     | 6                                                  | 7.5                               |
| 5.6<br>6.8<br>8.2<br>10.0<br>12.0<br>15.0               | B<br>B<br>B<br>B<br>B<br>B                    | T340B565(1)010AS<br>T340B685(1)010AS<br>T340B825(1)010AS<br>T340B106(1)010AS<br>T340B126(1)010AS<br>T340B156(1)010AS                                          | 1.0<br>1.0<br>1.0<br>1.0<br>1.0<br>3.0                  | 6<br>6<br>6<br>6<br>6<br>6                         | 2.5                               |
| 18.0<br>22.0<br>27.0<br>33.0<br>39.0                    | C<br>C<br>C<br>C<br>C                         | T340C186(1)010AS<br>T340C226(1)010AS<br>T340C276(1)010AS<br><b>T340C336(1)010AS</b><br>T340C396(1)010AS                                                       | 3.0<br>3.0<br>3.0<br><b>5.0</b><br>5.0                  | 6<br>6<br>6<br><b>6</b><br>6                       | 1.7                               |
| 47.0<br>56.0<br>68.0<br>82.0<br>100.0<br>120.0<br>150.0 | D/F<br>D/F<br>D/F<br>D/F<br>D/F<br>D/F<br>D/F | T340(2)476(1)010AS<br>T340(2)566(1)010AS<br>T340(2)686(1)010AS<br>T340(2)826(1)010AS<br><b>T340(2)107(1)010AS</b><br>T340(2)127(1)010AS<br>T340(2)157(1)010AS | 5.0<br>5.0<br>5.0<br>8.0<br><b>10.0</b><br>10.0<br>10.0 | 6<br>6<br>6<br>6<br><b>6</b><br>6<br>6             | 1.0                               |
| 220.0                                                   | E                                             | T340E227(1)010AS                                                                                                                                              | 10.0                                                    | 6                                                  | 0.5                               |
| <b>15/16 VOLT RATING AT 85°C — 10 VOLT AT 125°C</b>     |                                               |                                                                                                                                                               |                                                         |                                                    |                                   |
| 3.3                                                     | A                                             | <b>T340A335(1)015AS</b>                                                                                                                                       | 1.0                                                     | 6                                                  | 9.0                               |
| 3.9<br>4.7<br>5.6<br>6.8<br>8.2<br>10.0                 | B<br>B<br>B<br>B<br>B<br>B                    | T340B395(1)015AS<br>T340B475(1)015AS<br>T340B565(1)015AS<br>T340B685(1)015AS<br>T340B825(1)015AS<br><b>T340B106(1)015AS</b>                                   | 1.0<br>1.0<br>1.0<br>1.0<br>1.0<br><b>3.0</b>           | 6<br>6<br>6<br>6<br>6<br><b>6</b>                  | 3.2                               |

(1) To complete KEMET Part Number, insert M — ±20%, K — ±10%, or J — ±5% for capacitance tolerance as shown in T340 ordering information.  
(2) To complete KEMET Part Number, insert letter "D" for 10.0 mm (.394) lead spacing or letter "F" for 5.0 mm (.197) lead spacing. See page 53 for outline drawings.  
**Bold face** lines indicate popular part types and values.  
Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET'S option.

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                            | CASE<br>SIZE | KEMET<br>PART NUMBER      | MAX.<br>DC<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MAX<br>IMPEDANCE<br>Ω@<br>10 kHz |
|--------------------------------------------------------------|--------------|---------------------------|----------------------------------|----------------------------------------------------|----------------------------------|
| <b>15/16 VOLT RATING AT 85°C — 10 VOLT AT 125°C (Cont'd)</b> |              |                           |                                  |                                                    |                                  |
| 12.0                                                         | C            | T340C126(1)015AS          | 3.0                              | 6                                                  | 2.5                              |
| 15.0                                                         | C            | T340C156(1)015AS          | 3.5                              | 6                                                  |                                  |
| 18.0                                                         | C            | T340C186(1)015AS          | 4.0                              | 6                                                  | 2.1                              |
| <b>22.0</b>                                                  | <b>C</b>     | <b>T340C226(1)015AS</b>   | <b>4.0</b>                       | <b>6</b>                                           |                                  |
| 27.0                                                         | C            | T340C276(1)015AS          | 5.0                              | 6                                                  |                                  |
| 33.0                                                         | C            | T340C336(1)015AS          | 5.0                              | 6                                                  |                                  |
| 39.0                                                         | D/F          | T340(2)396(1)015AS        | 7.0                              | 6                                                  | 1.3                              |
| <b>47.0</b>                                                  | <b>D/F</b>   | <b>T340(2)476(1)015AS</b> | <b>7.0</b>                       | <b>6</b>                                           |                                  |
| 56.0                                                         | D/F          | T340(2)566(1)015AS        | 8.0                              | 6                                                  | 1.1                              |
| <b>68.0</b>                                                  | <b>D/F</b>   | <b>T340(2)686(1)015AS</b> | <b>9.0</b>                       | <b>6</b>                                           |                                  |
| 82.0                                                         | D/F          | T340(2)826(1)015AS        | 10.0                             | 6                                                  |                                  |
| 100.0                                                        | E            | T340E107(1)015AS          | 10.0                             | 6                                                  | 0.8                              |
| <b>150.0</b>                                                 | <b>E</b>     | <b>T340E157(1)015AS</b>   | <b>10.0</b>                      | <b>6</b>                                           | <b>0.6</b>                       |
| <b>20 VOLT RATING AT 85°C — 13 VOLT AT 125°C</b>             |              |                           |                                  |                                                    |                                  |
| 2.2                                                          | A            | T340A225(1)020AS          | 1.0                              | 6                                                  | 12.0                             |
| 3.3                                                          | B            | T340B335(1)020AS          | 1.0                              | 6                                                  | 8.0                              |
| 4.7                                                          | B            | T340B475(1)020AS          | 1.5                              | 6                                                  | 5.5                              |
| 6.8                                                          | B            | T340B685(1)020AS          | 2.5                              | 6                                                  | 4.2                              |
| 15.0                                                         | C            | T340C156(1)020AS          | 5.0                              | 6                                                  | 2.5                              |
| 47.0                                                         | D            | T340D476(1)020AS          | 9.0                              | 6                                                  | 1.3                              |
| 100.0                                                        | E            | T340E107(1)020AS          | 10.0                             | 6                                                  | 0.8                              |
| <b>25 VOLT RATING AT 85°C — 16 VOLT AT 125°C</b>             |              |                           |                                  |                                                    |                                  |
| <b>1.5</b>                                                   | <b>A</b>     | <b>T340A155(1)025AS</b>   | <b>1.0</b>                       | <b>6</b>                                           | <b>17.0</b>                      |
| 2.7                                                          | B            | T340B275(1)025AS          | 1.0                              | 6                                                  | 5.5                              |
| 3.3                                                          | B            | T340B335(1)025AS          | 1.0                              | 6                                                  |                                  |
| 3.9                                                          | B            | T340B395(1)025AS          | 1.0                              | 6                                                  |                                  |
| 4.7                                                          | B            | T340B475(1)025AS          | 2.0                              | 6                                                  |                                  |
| 5.6                                                          | C            | T340C565(1)025AS          | 2.0                              | 6                                                  | 4.2                              |
| 6.8                                                          | C            | T340C685(1)025AS          | 3.0                              | 6                                                  |                                  |
| 8.2                                                          | C            | T340C825(1)025AS          | 3.0                              | 6                                                  |                                  |
| <b>10.0</b>                                                  | <b>C</b>     | <b>T340C106(1)025AS</b>   | <b>3.5</b>                       | <b>6</b>                                           |                                  |
| 12.0                                                         | C            | T340C126(1)025AS          | 3.5                              | 6                                                  | 3.0                              |
| 15.0                                                         | C            | T340C156(1)025AS          | 4.0                              | 6                                                  |                                  |
| 18.0                                                         | D/F          | T340(2)186(1)025AS        | 5.0                              | 6                                                  | 2.0                              |
| 22.0                                                         | D/F          | T340(2)226(1)025AS        | 5.5                              | 6                                                  |                                  |
| 27.0                                                         | D/F          | T340(2)276(1)025AS        | 7.0                              | 6                                                  | 1.5                              |
| <b>33.0</b>                                                  | <b>D/F</b>   | <b>T340(2)336(1)025AS</b> | <b>8.0</b>                       | <b>6</b>                                           |                                  |
| 39.0                                                         | D/F          | T340(2)396(1)025AS        | 10.0                             | 6                                                  |                                  |
| 47.0                                                         | D/E/F        | T340(2)476(1)025AS        | 10.0                             | 6                                                  | 1.3                              |
| 68.0                                                         | E            | T340E686(1)025AS          | 10.0                             | 6                                                  | 0.9                              |
| <b>35 VOLT RATING AT 85°C — 23 VOLT AT 125°C</b>             |              |                           |                                  |                                                    |                                  |
| 0.1                                                          | A            | T340A104(1)035AS          | 1.0                              | 6                                                  | 220.0                            |
| 0.15                                                         | A            | T340A154(1)035AS          | 1.0                              | 6                                                  | 150.0                            |
| 0.22                                                         | A            | T340A224(1)035AS          | 1.0                              | 6                                                  | 100.0                            |
| 0.33                                                         | A            | T340A334(1)035AS          | 1.0                              | 6                                                  | 75.0                             |
| 0.47                                                         | A            | T340A474(1)035AS          | 1.0                              | 6                                                  | 50.0                             |
| 0.68                                                         | A            | T340A684(1)035AS          | 1.0                              | 6                                                  | 36.0                             |
| <b>1.0</b>                                                   | <b>A</b>     | <b>T340A105(1)035AS</b>   | <b>1.0</b>                       | <b>6</b>                                           | <b>25.0</b>                      |
| 1.2                                                          | B            | T340B125(1)035AS          | 1.0                              | 6                                                  | 15.0                             |
| 1.5                                                          | B            | T340B155(1)035AS          | 1.0                              | 6                                                  |                                  |
| 1.8                                                          | B            | T340B185(1)035AS          | 1.0                              | 6                                                  | 11.0                             |
| <b>2.2</b>                                                   | <b>B</b>     | <b>T340B225(1)035AS</b>   | <b>1.0</b>                       | <b>6</b>                                           |                                  |
| 2.7                                                          | B            | T340B275(1)035AS          | 1.0                              | 6                                                  |                                  |
| 3.3                                                          | B/C          | T340(2)335(1)035AS        | 1.0                              | 6                                                  | 7.5                              |

(1) To complete KEMET Part Number, insert M — ±20%, K — ±10%, or J — ±5% for capacitance tolerance as shown in T340 ordering information.

(2) To complete KEMET Part Number, insert letter "C" for 5.0 mm (.197") lead spacing, "D" for 10.0 mm (.394") lead spacing, "E" for 10.0 mm (.394") lead spacing or "F" for 5.0 mm (.197") lead spacing. See page 53 for outline drawings.

**Bold face** lines indicate popular part types and values.

Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET'S option.

**RATINGS & PART NUMBER REFERENCE**

| CAPACITANCE<br>μF                                         | CASE<br>SIZE | KEMET<br>PART NUMBER      | MAX.<br>DC<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120 HZ | MAX<br>IMPEDANCE<br>Ω@<br>10 kHz |
|-----------------------------------------------------------|--------------|---------------------------|----------------------------------|----------------------------------------------------|----------------------------------|
| <b>35 VOLT RATING AT 85°C — 23 VOLT AT 125°C (Cont'd)</b> |              |                           |                                  |                                                    |                                  |
| 3.9                                                       | C            | T340C395(1)035AS          | 1.0                              | 6                                                  |                                  |
| <b>4.7</b>                                                | <b>C</b>     | <b>T340C475(1)035AS</b>   | <b>2.5</b>                       | <b>6</b>                                           | <b>5.5</b>                       |
| 5.6                                                       | C            | T340C565(1)035AS          | 2.5                              | 6                                                  |                                  |
| <b>6.8</b>                                                | <b>C</b>     | <b>T340C685(1)035AS</b>   | <b>3.0</b>                       | <b>6</b>                                           | <b>4.2</b>                       |
| 8.2                                                       | C            | T340C825(1)035AS          | 4.0                              | 6                                                  |                                  |
| <b>10.0</b>                                               | <b>C</b>     | <b>T340(2)106(1)035AS</b> | <b>4.0</b>                       | <b>6</b>                                           | <b>2.8</b>                       |
| 12.0                                                      | D/F          | T340(2)126(1)035AS        | 5.0                              | 6                                                  |                                  |
| 15.0                                                      | D/F          | T340(2)156(1)035AS        | 5.0                              | 6                                                  | 2.2                              |
| 18.0                                                      | D/F          | T340(2)186(1)035AS        | 8.0                              | 6                                                  |                                  |
| <b>22.0</b>                                               | <b>D/F</b>   | <b>T340(2)226(1)035AS</b> | <b>8.0</b>                       | <b>6</b>                                           | <b>1.9</b>                       |
| 27.0                                                      | D/F          | T340(2)276(1)035AS        | 10.0                             | 6                                                  |                                  |
| 33.0                                                      | D/E/F        | T340(2)336(1)035AS        | 10.0                             | 6                                                  | 1.4                              |
| <b>47.0</b>                                               | <b>E</b>     | <b>T340E476(1)035AS</b>   | <b>10.0</b>                      | <b>6</b>                                           | <b>1.1</b>                       |
| <b>40 VOLT RATING AT 85°C — 32 VOLT AT 100°C</b>          |              |                           |                                  |                                                    |                                  |
| 0.1                                                       | A            | T340A104(1)040AS          | 1.0                              | 6                                                  | 200.0                            |
| 0.15                                                      | A            | T340A154(1)040AS          | 1.0                              | 6                                                  | 140.0                            |
| 0.22                                                      | A            | T340A224(1)040AS          | 1.0                              | 6                                                  | 95.0                             |
| 0.33                                                      | A            | T340A334(1)040AS          | 1.0                              | 6                                                  | 70.0                             |
| 0.47                                                      | A            | T340A474(1)040AS          | 1.0                              | 6                                                  | 46.0                             |
| 0.68                                                      | A            | T340A684(1)040AS          | 1.0                              | 6                                                  | 34.0                             |
| 1.0                                                       | A            | T340A105(1)040AS          | 1.0                              | 6                                                  | 23.0                             |
| 1.5                                                       | B            | T340B155(1)040AS          | 1.0                              | 6                                                  | 14.0                             |
| 2.2                                                       | B            | T340B225(1)040AS          | 1.7                              | 6                                                  | 10.0                             |
| 3.3                                                       | C            | T340C335(1)040AS          | 2.3                              | 6                                                  | 7.0                              |
| 4.7                                                       | C            | T340C475(1)040AS          | 3.0                              | 6                                                  | 5.0                              |
| 6.8                                                       | C            | T340C685(1)040AS          | 3.5                              | 6                                                  | 3.9                              |
| 10.0                                                      | D            | T340D106(1)040AS          | 4.5                              | 6                                                  | 2.6                              |
| 15.0                                                      | D            | T340D156(1)040AS          | 6.0                              | 6                                                  | 2.0                              |
| 22.0                                                      | D            | T340D226(1)040AS          | 9.0                              | 6                                                  | 1.7                              |
| 33.0                                                      | E            | T340E336(1)040AS          | 10.0                             | 6                                                  | 1.3                              |
| 47.0                                                      | E            | T340E476(1)040AS          | 10.0                             | 6                                                  | 1.0                              |
| <b>50 VOLT RATING AT 85°C — 33 VOLT AT 125°C</b>          |              |                           |                                  |                                                    |                                  |
| 0.1                                                       | A            | T340A104(1)050AS          | 1.0                              | 6                                                  | 220.0                            |
| 0.15                                                      | A            | T340A154(1)050AS          | 1.0                              | 6                                                  | 150.0                            |
| 0.22                                                      | A            | T340A224(1)050AS          | 1.0                              | 6                                                  | 100.0                            |
| 0.33                                                      | A            | T340A334(1)050AS          | 1.0                              | 6                                                  | 75.0                             |
| 0.39                                                      | B            | T340B394(1)050AS          | 1.0                              | 6                                                  |                                  |
| 0.47                                                      | B            | T340B474(1)050AS          | 1.0                              | 6                                                  | 50.0                             |
| 0.56                                                      | B            | T340B564(1)050AS          | 1.0                              | 6                                                  |                                  |
| 0.68                                                      | B            | T340B684(1)050AS          | 1.0                              | 6                                                  | 36.0                             |
| 0.82                                                      | B            | T340B824(1)050AS          | 1.0                              | 6                                                  |                                  |
| 1.0                                                       | B            | T340B105(1)050AS          | 1.0                              | 6                                                  | 25.0                             |
| 1.2                                                       | B            | T340B125(1)050AS          | 1.0                              | 6                                                  |                                  |
| 1.5                                                       | B/C          | T340(2)155(1)050AS        | 1.1                              | 6                                                  | 15.0                             |
| 1.8                                                       | B            | T340B185(1)050AS          | 1.1                              | 6                                                  |                                  |
| 2.2                                                       | B/C          | T340(2)225(1)050AS        | 1.5                              | 6                                                  | 11.0                             |
| 2.7                                                       | C            | T340C275(1)050AS          | 1.5                              | 6                                                  |                                  |
| 3.3                                                       | C/D          | T340(2)335(1)050AS        | 2.5                              | 6                                                  | 7.5                              |
| 3.9                                                       | C            | T340C395(1)050AS          | 3.0                              | 6                                                  |                                  |
| 4.7                                                       | C/D          | T340(2)475(1)050AS        | 3.5                              | 6                                                  | 5.5                              |
| 5.6                                                       | C            | T340C565(1)050AS          | 4.0                              | 6                                                  |                                  |
| 6.8                                                       | D/F          | T340(2)685(1)050AS        | 5.0                              | 6                                                  | 4.0                              |
| 8.2                                                       | D/F          | T340(2)825(1)050AS        | 6.0                              | 6                                                  |                                  |
| 10.0                                                      | D/F          | T340(2)106(1)050AS        | 7.0                              | 6                                                  | 2.8                              |
| 12.0                                                      | D/F          | T340(2)126(1)050AS        | 8.0                              | 6                                                  |                                  |
| 15.0                                                      | D/F          | T340(2)156(1)050AS        | 9.0                              | 6                                                  | 2.2                              |
| 18.0                                                      | D/F          | T340(2)186(1)050AS        | 10.0                             | 6                                                  |                                  |
| 22.0                                                      | E            | T340E226(1)050AS          | 10.0                             | 6                                                  | 1.7                              |

(1) To complete KEMET Part Number, insert M — ±20%, K — ±10%, or J — ±5% for capacitance tolerance as shown in T340 ordering information.

(2) To complete KEMET Part Number, insert letter "C" for 5.0 mm (.197") lead spacing, "D" for 10.0 mm (.394") lead spacing, "E" for 10.0 mm (.394") lead spacing or letter "F" for 5.0 mm (.197") lead spacing. See page 53 for outline drawings.

**Bold face** lines indicate popular part types and values.

Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET'S option.

The KEMET Micron Series is available in a variety of case styles and sizes. They are designed to operate from -55°C to +85°C at full voltage and to +125°C with derating. Typical applications include use in bypass coupling, filtering, and timing circuits.

The KEMET Micron Series is qualified under MIL-PRF-49137/6 as military styles CX06 (T378 Series).

The KEMET T370 Series is encapsulated in a molded gold color epoxy. This encasement technique allows maximum utilization of circuit board real estate with precisely centered leads in a microminiature case.

These molded packages also provide significant improvements in overall dimensional consistency as well as lead wires precisely spaced to within .010 inches (.25mm).

With our new molded packaging design, these capacitors can now be marked using our laser printing technique. The KEMET laser marking system ensures legibility and permanency while offering a complete alphanumeric print format. Laser print meets all requirements of the Resistance to Solvents Test, method 215 of MIL-STD-202.

## PERFORMANCE CHARACTERISTICS

- **CAPACITANCE/VOLTAGE RANGE:**  
T370 Series: 0.68-220μF, 3-35 Volts.  
T378 Series: 2.2-220μF, 3-35 Volts.
- **CAPACITANCE TOLERANCE:** Available in standard EIA nominal values with ±20% tolerance standard, +40% -20%, ±10% and ±5% are also available.
- **DISSIPATION FACTOR:** Maximum DF limits are shown in corresponding series part number listings on page 60. See Application Notes Section, page 76 for additional information.
- **DC LEAKAGE CURRENT:** Maximum leakage values at 25° are shown in part number listings, page 60. See Application Notes Section, page 76 for additional information.
- **RATED VOLTAGE; WORKING VOLTAGE; SURGE VOLTAGE; REVERSE VOLTAGE:** See Application Notes Section, pages 76 & 77 for description.
- **IMPEDANCE and ESR:** See Application Notes Section, pages 78 for description. Reference ESR values are listed in table below.
- **AC RIPPLE VOLTAGE:** Permissible AC ripple volt-

**T370 ESR (OHMS) at 100 kHz @ +25°C**  
(The ESR values provided below are for reference only. No warranty, as stated on page 3 and reincorporated here, is made as to the accuracy of these values for any particular T370 Series product.)

| Cap.<br>μF | 6<br>Volt | 10<br>Volt | 15<br>Volt | 20<br>Volt | 25<br>Volt | 35<br>Volt |
|------------|-----------|------------|------------|------------|------------|------------|
| 0.68       |           |            |            |            |            | 10.0       |
| 1.00       |           |            |            |            |            | 8.0        |
| 1.50       |           |            |            |            |            | 6.0        |
| 2.20       |           |            |            |            | 6.0        | 5.0        |
| 3.30       |           |            |            | 5.5        | 5.0        | 4.0        |
| 4.70       |           |            |            | 4.5        | 4.0        | 3.0        |
| 6.80       |           | 6.0        |            | 3.6        | 3.1        | 2.5        |
| 10.0       | 6.0       | 5.0        |            | 2.9        | 2.5        | 2.0        |
| 15.0       | 5.0       | 3.7        | 2.5        | 2.3        | 2.0        | 1.6        |
| 22.0       | 3.7       | 2.7        | 2.0        | 1.8        | 1.5        | 1.3        |
| 33.0       | 3.0       | 2.1        | 1.6        | 1.4        | 1.2        |            |
| 47.0       | 2.0       | 1.7        | 1.3        | 1.2        |            |            |
| 68.0       | 1.8       | 1.3        | 1.0        |            |            |            |
| 100.0      | 1.6       | 1.0        |            |            |            |            |
| 150.0      | 0.9       |            |            |            |            |            |

age is related to the ESR of the capacitor and the power dissipation capabilities of a particular case size. Thermal capacities for the various case sizes have been determined and are listed in Table below. For additional description see page 78.

### ENVIRONMENTAL CONSIDERATIONS:

| Case<br>Size | Watts |
|--------------|-------|
| C            | .070  |
| D            | .080  |
| E            | .090  |
| F            | .100  |

Maximum Power Dissipation Capability @ 25°C

- A. Shock Test: MIL-STD-202, Method 213 Condition 1.
  - B. Thermal Shock, MIL-STD-202, Method 107.
  - C. Moisture Resistance: MIL-STD-202, Method 106.
  - D. Solderability: MIL-STD-202, Method 208.
- For additional Environmental Test Information see pages 80, 81 and 82.
- **LEAD MATERIAL:** Solder coated nickel per MIL-STD1266, type N32.
  - **LEAD TAPE and REEL:** Reeling per specification RS-468. See pages 72 and 74 for additional information.

## CAPACITOR OUTLINE DRAWING



## DIMENSIONS - INCHES (MILLIMETER)

| CASE SIZE | H MAX.       | W MAX.      | T MAX.      | S LEAD SPACING           | LEAD DIAMETER ± .001 (.03) |
|-----------|--------------|-------------|-------------|--------------------------|----------------------------|
| *C        | .225 (5.72)  | .185 (4.70) | .075 (1.91) | .150 ± .010 (3.81 ± .25) | .016 (.41)                 |
| D         | .290 (7.37)  | .220 (5.59) | .110 (2.79) | .180 ± .010 (4.57 ± .25) | .016 (.41)                 |
| E         | .310 (7.87)  | .230 (5.84) | .130 (3.30) | .200 ± .010 (5.08 ± .25) | .016 (.41)                 |
| F         | .475 (12.07) | .375 (9.53) | .150 (3.81) | .300 ± .010 (7.62 ± .25) | .016 (.41)                 |

\*C case size T370 style only.

## CAPACITOR MARKING

## INDUSTRIAL PRODUCT

## MILITARY PRODUCT

ORDERING INFORMATION  
KEMET PART NUMBER

\*Part Number Example: T370D475M035AS (14 digits – no spaces)

MIL-PRF-49137/6 PART NUMBER  
CX06(T378) STYLE

| Symbol | Rated (85°C)<br>Volts, dc | Surge (85°C)<br>Volts, dc |
|--------|---------------------------|---------------------------|
| A      | 2                         | 2.6                       |
| B      | 3                         | 4                         |
| C      | 4                         | 5                         |
| D      | 6                         | 8                         |
| F      | 10                        | 13                        |
| H      | 15                        | 20                        |
| J      | 20                        | 26                        |
| K      | 25                        | 32                        |
| M      | 35                        | 46                        |

**CAPACITANCE**  
The nominal capacitance value, expressed in picofarads (pF), is identified by a three digit number. The first two digits represent significant figures and the last digit specifies the number of zeros to follow.



# TANTALUM MOLDED / RADIAL — MIL-PRF-49137/6

## T370/T378 (CX06) SERIES

### RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                               | CASE<br>SIZE | INDUSTRIAL PRODUCT<br>T370<br>PART NO. | MILITARY PRODUCT                                                                                      |                                                                                                                                          | DC LEAKAGE<br>μA@25°C<br>MAXIMUM | DISSIPATION FACTOR<br>%@25°C 120HZ<br>MAXIMUM |
|-------------------------------------------------|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------|
|                                                 |              |                                        | CX06<br>PART NO.                                                                                      | T378<br>PART NO.                                                                                                                         |                                  |                                               |
| 3 VOLT RATING AT 85°C—2.0 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 220.0                                           | F            | T370F227(1)003AS                       | CX06B227(2)                                                                                           | T378F227(3)003AS                                                                                                                         | 9.0                              | 15                                            |
| 4 VOLT RATING AT 85°C—2.7 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 15.0                                            | C            | T370C156(1)004AS                       | CX06C476(2)<br>CX06C686(2)                                                                            | T378D476(3)004AS                                                                                                                         | 1.0                              | 8                                             |
| 47.0                                            | D            | T370D476(1)004AS                       |                                                                                                       | T378E476(3)004AS                                                                                                                         | 2.0                              | 8                                             |
| 68.0                                            | E            | T370E686(1)004AS                       |                                                                                                       | T378E686(3)004AS                                                                                                                         | 3.0                              | 8                                             |
| 6 VOLT RATING AT 85°C—4.0 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 10.0                                            | C            | T370C106(1)006AS                       | CX06D336(2)<br>CX06D476(2)<br>CX06D157(2)                                                             | T378D336(3)006AS                                                                                                                         | 1.0                              | 6                                             |
| 33.0                                            | D            | T370D336(1)006AS                       |                                                                                                       | T378E476(3)006AS                                                                                                                         | 2.0                              | 6                                             |
| 47.0                                            | E            | T370E476(1)006AS                       |                                                                                                       | T378F157(3)006AS                                                                                                                         | 3.0                              | 6                                             |
| 150.0                                           | F            | T370F157(1)006AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 10                                            |
| 10 VOLT RATING AT 85°C—7.0 VOLT RATING AT 125°C |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 6.8                                             | C            | T370C685(1)010AS                       | CX06F226(2)<br>CX06F336(2)<br>CX06F107(2)                                                             | T378D226(3)010AS                                                                                                                         | 1.0                              | 6                                             |
| 22.0                                            | D            | T370D226(1)010AS                       |                                                                                                       | T378E336(3)010AS                                                                                                                         | 2.0                              | 6                                             |
| 33.0                                            | E            | T370E336(1)010AS                       |                                                                                                       | T378F107(3)010AS                                                                                                                         | 3.0                              | 6                                             |
| 100.0                                           | F            | T370F107(1)010AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 8                                             |
| 15 VOLT RATING AT 85°C—10 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 15.0                                            | D            | T370D156(1)015AS                       | CX06H156(2)                                                                                           | T378D156(3)015AS                                                                                                                         | 2.0                              | 6                                             |
| 22.0                                            | E            | T370E226(1)015AS                       | CX06H226(2)                                                                                           | T378E226(3)015AS                                                                                                                         | 3.0                              | 6                                             |
| 68.0                                            | F            | T370F686(1)015AS                       | CX06H686(2)                                                                                           | T378F686(3)015AS                                                                                                                         | 9.0                              | 8                                             |
| 20 VOLT RATING AT 85°C—13 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 3.3                                             | C            | T370C335(1)020AS                       | CX06J106(2)<br>CX06J156(2)<br>CX06J476(2)                                                             | T378D106(3)020AS<br>T378E156(3)020AS<br>T378F476(3)020AS                                                                                 | 1.0                              | 6                                             |
| 4.7                                             | C            | T370C475(1)020AS                       |                                                                                                       |                                                                                                                                          | 1.0                              | 6                                             |
| 10.0                                            | D            | T370D106(1)020AS                       |                                                                                                       |                                                                                                                                          | 2.0                              | 6                                             |
| 15.0                                            | E            | T370E156(1)020AS                       |                                                                                                       |                                                                                                                                          | 3.0                              | 6                                             |
| 47.0                                            | F            | T370F476(1)020AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 8                                             |
| 25 VOLT RATING AT 85°C—17 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 2.2                                             | C            | T370C225(1)025AS                       | CX06K685(2)<br>CX06K106(2)<br>CX06K336(2)                                                             | T378D685(3)025AS<br>T378E106(3)025AS<br>T378F336(3)025AS                                                                                 | 1.0                              | 6                                             |
| 6.8                                             | D            | T370D685(1)025AS                       |                                                                                                       |                                                                                                                                          | 2.0                              | 6                                             |
| 10.0                                            | E            | T370E106(1)025AS                       |                                                                                                       |                                                                                                                                          | 3.0                              | 6                                             |
| 33.0                                            | F            | T370F336(1)025AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 6                                             |
| 35 VOLT RATING AT 85°C—23 VOLT RATING AT 125°C  |              |                                        |                                                                                                       |                                                                                                                                          |                                  |                                               |
| 0.68                                            | C            | T370C684(1)035AS                       | CX06M225(2)<br>CX06M335(2)<br>CX06M475(2)<br>CX06M685(2)<br>CX06M106(2)<br>CX06M156(2)<br>CX06M226(2) | T378D225(3)035AS<br>T378D335(3)035AS<br>T378D475(3)035AS<br>T378E685(3)035AS<br>T378F106(3)035AS<br>T378F156(3)035AS<br>T378F226(3)035AS | 1.0                              | 6                                             |
| 1.0                                             | C            | T370C105(1)035AS                       |                                                                                                       |                                                                                                                                          | 1.0                              | 6                                             |
| 1.5                                             | C            | T370C155(1)035AS                       |                                                                                                       |                                                                                                                                          | 1.0                              | 6                                             |
| 2.2                                             | D            | T370D225(1)035AS                       |                                                                                                       |                                                                                                                                          | 2.0                              | 6                                             |
| 3.3                                             | D            | T370D335(1)035AS                       |                                                                                                       |                                                                                                                                          | 2.0                              | 6                                             |
| 4.7                                             | D            | T370D475(1)035AS                       |                                                                                                       |                                                                                                                                          | 2.0                              | 6                                             |
| 6.8                                             | E            | T370E685(1)035AS                       |                                                                                                       |                                                                                                                                          | 3.0                              | 6                                             |
| 10.0                                            | F            | T370F106(1)035AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 6                                             |
| 15.0                                            | F            | T370F156(1)035AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 6                                             |
| 22.0                                            | F            | T370F226(1)035AS                       |                                                                                                       |                                                                                                                                          | 9.0                              | 6                                             |

(1) To complete KEMET part number, insert capacitance tolerance symbol as follows: L = +40%, -20%; M = ±20%; K = ±10%; J = ±5%.

(2) To complete military part number, insert capacitance tolerance symbol as follows: M = ±20%; K = ±10%.

(3) To complete KEMET part number, insert capacitance tolerance symbol as follows: M = ±20%; K = ±10%.

## PERFORMANCE CHARACTERISTICS

- **CAPACITANCE/VOLTAGE RANGE:**  
T35X/T39X: 0.1-680 $\mu$ F, 3-50 Volts.  
T36X: 0.1-330 $\mu$ F, 6-50 Volts.
- **CAPACITANCE TOLERANCE:** Available in standard EIA nominal values with  $\pm 20\%$  and  $\pm 10\%$  standard.
- **DISSIPATION FACTOR:** Maximum DF limits are shown in corresponding series part number listings. See Application Notes Section, page 76 for additional information.
- **DC LEAKAGE CURRENT:** Maximum leakage values at 25° are shown in part number listings, pages 63-65, 67, 68 and 70. See Application Notes Section, pages 76 & 77 for additional information.
- **RATED VOLTAGE; WORKING VOLTAGE; SURGE VOLTAGE; REVERSE VOLTAGE:** See Application Notes Section, pages 76 & 77 for description.
- **IMPEDANCE and ESR:** See Application Notes Section, page 77 & 78 for description. Reference ESR values are shown in table below.

**Commercial T35X/T36X/T39X ESR (OHMS) at 100 kHz @ +25°C**  
(The ESR values provided below are for reference only. No warranty, as stated on page 3 and reincorporated here, is made as to the accuracy of these values for any particular T35X, T36X, T39X Series product.)

| Cap.<br>$\mu$ F | 6<br>Volt | 10<br>Volt | 16<br>Volt | 20<br>Volt | 25<br>Volt | 35<br>Volt | 50<br>Volt |
|-----------------|-----------|------------|------------|------------|------------|------------|------------|
| 0.10            |           |            |            |            |            | 26.0       | 26.0       |
| 0.15            |           |            |            |            |            | 21.0       | 21.0       |
| 0.22            |           |            |            |            |            | 17.0       | 17.0       |
| 0.33            |           |            |            |            |            | 15.0       | 15.0       |
| 0.47            |           |            |            |            |            | 13.0       | 13.0       |
| 0.68            |           |            |            |            |            | 10.0       | 10.0       |
| 1.00            |           |            |            | 10.0       | 10.0       | 8.0        | 8.0        |
| 1.50            |           |            | 10.0       | 9.0        | 8.0        | 6.0        | 5.0        |
| 2.20            |           | 13.0       | 8.0        | 7.0        | 6.0        | 5.0        | 3.5        |
| 3.30            | 13.0      | 10.0       | 6.0        | 5.5        | 5.0        | 4.0        | 3.0        |
| 4.70            | 10.0      | 8.0        | 5.0        | 4.5        | 4.0        | 3.0        | 2.5        |
| 6.80            | 8.0       | 6.0        | 4.0        | 3.6        | 3.1        | 2.5        | 2.0        |
| 10.0            | 6.0       | 5.0        | 3.2        | 2.9        | 2.5        | 2.0        | 1.6        |
| 15.0            | 5.0       | 3.7        | 2.5        | 2.3        | 2.0        | 1.6        | 1.2        |
| 22.0            | 3.7       | 2.7        | 2.0        | 1.8        | 1.5        | 1.3        | 1.0        |
| 33.0            | 3.0       | 2.1        | 1.6        | 1.4        | 1.2        | 1.0        |            |
| 47.0            | 2.0       | 1.7        | 1.3        | 1.2        | 1.0        | 0.8        |            |
| 68.0            | 1.8       | 1.3        | 1.0        | 0.9        | 0.8        |            |            |
| 100.0           | 1.6       | 1.0        | 0.8        | 0.6        |            |            |            |
| 150.0           | 0.9       | 0.8        | 0.6        |            |            |            |            |
| 220.0           | 0.9       | 0.6        |            |            |            |            |            |
| 330.0           | 0.7       |            |            |            |            |            |            |

- **AC RIPPLE VOLTAGE:** Permissible AC ripple voltage is related to equivalent series resistance (ESR) and power dissipation capability. Maximum power dissipation for each case size is listed in Table below. For additional description see page 78.

| Case Size | Power Dissipation<br>(max.) @ 25°C (watts) |
|-----------|--------------------------------------------|
| T35X, A   | .040                                       |
| T39X B    | .050                                       |
| C         | .060                                       |
| D         | .065                                       |
| E         | .070                                       |
| F         | .080                                       |
| G         | .090                                       |
| H         | .100                                       |
| J         | .110                                       |
| K         | .120                                       |
| L         | .130                                       |
| M         | .140                                       |
| T36X A    | .050                                       |
| B         | .075                                       |
| C         | .090                                       |
| D         | .135                                       |

Maximum Power Dissipation Capability @ 25°C

- **ENVIRONMENTAL CONSIDERATIONS:**
  - A. Shock Test: MIL-STD-202, Method 213.
  - B. Thermal Shock, MIL-STD-202, Method 107, Condition A.
  - C. Moisture Resistance: MIL-STD-202, Method 106.
  - D. Solderability: MIL-STD-202, Method 208.
For additional Environmental Test Information see pages 80, 81 and 82.
- **LEAD MATERIAL:** Effective June 30, 2005 the T35x, T368 and T39x Series will be available, as an option, with 100% Matte Tin (RoHS compliant) lead wire or Sn/Pb lead wire. Please see page 63 for part number ordering information. The T363 and T369 lead material will remain Sn/Pb solder coated steel core with a copper ply per MIL-STD-127 and at this time will not be available with a 100% Sn option.
- **LEAD TAPE AND REEL:** Reeling per specification RS-468. See pages 72 - 74 for additional information.

The KEMET 'UltraDip II' Capacitors offer the designer of quality instruments and entertainment systems the widely recognized advantages inherent in solid tantalum capacitors at competitive prices.

The 'UltraDip II' Series, miniature dipped solid tantalum capacitors, provide the designer with the advantage of compactness plus low leakage and low DF performance characteristics for filtering, bypassing, coupling, blocking and RC timing circuits. This series features a capacitance range from 0.1 to 680 microfarads at voltages from 3 to 50 VDC. 'UltraDip II' capacitors utilize the same sophisticated materials and processes which have advanced KEMET Electronics Corporation to the leadership position in solid tantalum capacitors.

The plastic case provides a tough barrier coating and maintains precision of lead wire spacing within  $\pm 0.015$  inch. The gold color epoxy utilized permits Laser marking with outstanding permanency and legibility. All case sizes are printed with capacitance, voltage, polarity and vendor identification.

Solid tantalum devices exhibit no degradation failure mode during shelf storage and show a constantly decreasing failure rate (i.e., absence of wearout mechanism) during life tests.

The 'UltraDip II' Series provides self-insulating cases which are resistant to shock and vibration. These capacitors exhibit low DCL, ESR and Impedance and have excellent temperature stability.

Effective June 30, 2005 the T35x Series is RoHS compliant.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES (MILLIMETERS)

|                  | All               | T350                           | T351                           | T352                           | T353                           | T354                           | T355                           | T356                           |
|------------------|-------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Case Size        | D<br>Max Diameter | H <sup>(1)</sup><br>Max Height | H <sup>(1)</sup><br>Max Height | H <sup>(1)</sup><br>Max Height | H <sup>(1)</sup><br>Max Height | H <sup>(1)</sup><br>Max Height | H <sup>(1)</sup><br>Max Height | H <sup>(1)</sup><br>Max Height |
| A                | .175 (4.5)        | .280 (7.1)                     | .380 (9.6)                     | .400 (10.2)                    | .400 (10.2)                    | .340 (8.6)                     | .340 (8.6)                     | .340 (8.6)                     |
| B                | .175 (4.5)        | .300 (7.6)                     | .390 (9.9)                     | .410 (10.4)                    | .410 (10.4)                    | .350 (8.9)                     | .350 (8.9)                     | .350 (8.9)                     |
| C                | .196 (5.0)        | .330 (8.4)                     | .420 (10.7)                    | .440 (11.2)                    | .440 (11.2)                    | .380 (9.6)                     | .380 (9.6)                     | .380 (9.6)                     |
| D                | .196 (5.0)        | .340 (8.6)                     | .430 (10.9)                    | .450 (11.4)                    | .450 (11.4)                    | .390 (9.9)                     | .390 (9.9)                     | .390 (9.9)                     |
| E                | .216 (5.5)        | .350 (8.9)                     | .440 (11.2)                    | .460 (11.7)                    | .460 (11.7)                    | .400 (10.2)                    | .400 (10.2)                    | .400 (10.2)                    |
| F                | .236 (6.0)        | .390 (9.9)                     | .480 (12.2)                    | .500 (12.7)                    | .500 (12.7)                    | .440 (11.2)                    | .440 (11.2)                    | .440 (11.2)                    |
| G                | .250 (6.3)        | .400 (10.2)                    | .490 (12.4)                    | .510 (13.0)                    | .510 (13.0)                    | .450 (11.4)                    | .450 (11.4)                    | .450 (11.4)                    |
| H                | .300 (7.6)        | .400 (10.2)                    | .500 (12.7)                    | .520 (13.2)                    | .520 (13.2)                    | .470 (11.9)                    | .470 (11.9)                    | .470 (11.9)                    |
| J <sup>(2)</sup> | .330 (8.4)        | .500 (12.7)                    | Note 3                         | Note 3                         | .580 (14.7)                    | .550 (14.0)                    | Note 3                         | .550 (14.0)                    |
| K <sup>(2)</sup> | .350 (8.9)        | .530 (13.5)                    |                                |                                | .630 (16.0)                    | .610 (15.5)                    |                                | .610 (15.5)                    |
| L <sup>(2)</sup> | .350 (8.9)        | .630 (16.0)                    |                                |                                | .730 (18.5)                    | .710 (18.1)                    |                                | .710 (18.1)                    |
| M <sup>(2)</sup> | .400 (10.2)       | .670 (17.0)                    |                                |                                | .760 (19.3)                    | .740 (18.8)                    |                                | .740 (18.8)                    |

NOTES: (1) All "H" Dimensions are from Capacitor seating plane to top of Capacitor.  
 (2) On T350 Series, case sizes A-H are supplied with .100" (2.54) lead spacing—case sizes J-M are supplied with .200" (5.08) lead spacing.  
 (3) These case sizes are not available for T351, T352 & T355 capacitors.

### LEAD CONFIGURATION & SPACING CHART

| CASE | LEAD CONFIGURATION | SERIES |               |               |      |      |               |      |
|------|--------------------|--------|---------------|---------------|------|------|---------------|------|
|      |                    | T350   | T351          | T352          | T353 | T354 | T355          | T356 |
| A-H  | .100               | X      | X             |               |      |      |               |      |
|      | .125               |        |               |               |      |      | X             |      |
|      | .200               |        |               | X             | X    |      |               | X    |
|      | .250               |        |               |               |      | X    |               |      |
|      | STRAIGHT LEAD      | X      |               |               |      |      |               |      |
|      | STAND OFF          |        | X             | X             |      | X    | X             | X    |
| J-M  | SNAP-IN            |        |               |               | X    |      |               |      |
|      | .100               |        | NOT AVAILABLE | NOT AVAILABLE |      |      | NOT AVAILABLE |      |
|      | .125               |        |               |               |      |      |               |      |
|      | .200               | X      |               |               | X    |      |               | X    |
|      | .250               |        |               |               |      | X    |               |      |
|      | STRAIGHT LEAD      | X      |               |               |      |      |               |      |
|      | STAND OFF          |        |               |               |      | X    |               | X    |
|      | SNAP-IN            |        |               |               | X    |      |               |      |



# TANTALUM DIPPED / RADIAL - POLAR

## T350, T351, T352, T353, T354, T355 & T356 SERIES "ULTRADIP II"



### T35X & T36X ORDERING INFORMATION



### T35X & T36X MARKING INFORMATION



### T35X RATINGS AND PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                         | CASE SIZE | KEMET PART NUMBER    | D.C. LEAKAGE<br>μA@25°C | MAX. DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|-----------------------------------------------------------|-----------|----------------------|-------------------------|------------------------------------------------|
| <b>3 VOLT RATING AT 85°C —<br/>2 VOLT RATING AT 125°C</b> |           |                      |                         |                                                |
| 4.7                                                       | A         | T35(1)A475(3)003A(4) | 0.5                     | 5                                              |
| 5.6                                                       | A         | T35(1)A565(3)003A(4) | 0.5                     | 5                                              |
| 6.8                                                       | A         | T35(1)A685(3)003A(4) | 0.5                     | 5                                              |
| 8.2                                                       | A         | T35(1)A825(3)003A(4) | 0.5                     | 6                                              |
| 10.0                                                      | A         | T35(1)A106(3)003A(4) | 0.5                     | 6                                              |
| 12.0                                                      | B         | T35(1)B126(3)003A(4) | 0.5                     | 6                                              |
| 15.0                                                      | B         | T35(1)B156(3)003A(4) | 0.5                     | 6                                              |
| 18.0                                                      | C         | T35(1)C186(3)003A(4) | 0.5                     | 6                                              |
| 22.0                                                      | C         | T35(1)C226(3)003A(4) | 0.5                     | 6                                              |
| 27.0                                                      | D         | T35(1)D276(3)003A(4) | 0.6                     | 6                                              |
| 33.0                                                      | D         | T35(1)D336(3)003A(4) | 0.8                     | 6                                              |
| 39.0                                                      | E         | T35(1)E396(3)003A(4) | 0.9                     | 6                                              |
| 47.0                                                      | E         | T35(1)E476(3)003A(4) | 1.1                     | 6                                              |
| 56.0                                                      | F         | T35(1)F566(3)003A(4) | 1.3                     | 6                                              |
| 68.0                                                      | F         | T35(1)F686(3)003A(4) | 1.6                     | 6                                              |
| 82.0                                                      | G         | T35(1)G826(3)003A(4) | 2.0                     | 8                                              |
| 100.0                                                     | G         | T35(1)G107(3)003A(4) | 2.4                     | 8                                              |
| 120.0                                                     | H         | T35(1)H127(3)003A(4) | 2.9                     | 8                                              |
| 150.0                                                     | H         | T35(1)H157(3)003A(4) | 3.6                     | 8                                              |
| 180.0                                                     | J         | T35(2)J187(3)003A(4) | 4.3                     | 8                                              |
| 220.0                                                     | J         | T35(2)J227(3)003A(4) | 5.3                     | 8                                              |
| 270.0                                                     | K         | T35(2)K277(3)003A(4) | 6.5                     | 8                                              |
| 330.0                                                     | K         | T35(2)K337(3)003A(4) | 7.9                     | 8                                              |
| 390.0                                                     | L         | T35(2)L397(3)003A(4) | 9.4                     | 9                                              |
| 470.0                                                     | L         | T35(2)L477(3)003A(4) | 10.0                    | 9                                              |
| 560.0                                                     | M         | T35(2)M567(3)003A(4) | 10.0                    | 9                                              |
| 680.0                                                     | M         | T35(2)M687(3)003A(4) | 10.0                    | 9                                              |

| CAPACITANCE<br>μF                                           | CASE SIZE | KEMET PART NUMBER    | D.C. LEAKAGE<br>μA@25°C | MAX. DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|-------------------------------------------------------------|-----------|----------------------|-------------------------|------------------------------------------------|
| <b>6.3 VOLT RATING AT 85°C —<br/>4 VOLT RATING AT 125°C</b> |           |                      |                         |                                                |
| 3.3                                                         | A         | T35(1)A335(3)006A(4) | 0.5                     | 5                                              |
| 3.9                                                         | A         | T35(1)A395(3)006A(4) | 0.5                     | 5                                              |
| 4.7                                                         | A         | T35(1)A475(3)006A(4) | 0.5                     | 5                                              |
| 5.6                                                         | A         | T35(1)A565(3)006A(4) | 0.5                     | 5                                              |
| 6.8                                                         | A         | T35(1)A685(3)006A(4) | 0.5                     | 5                                              |
| 8.2                                                         | B         | T35(1)B825(3)006A(4) | 0.5                     | 6                                              |
| 10.0                                                        | B         | T35(1)B106(3)006A(4) | 0.5                     | 6                                              |
| 12.0                                                        | C         | T35(1)C126(3)006A(4) | 0.6                     | 6                                              |
| 15.0                                                        | C         | T35(1)C156(3)006A(4) | 0.7                     | 6                                              |
| 18.0                                                        | D         | T35(1)D186(3)006A(4) | 0.9                     | 6                                              |
| 22.0                                                        | D         | T35(1)D226(3)006A(4) | 1.1                     | 6                                              |
| 27.0                                                        | E         | T35(1)E276(3)006A(4) | 1.3                     | 6                                              |
| 33.0                                                        | E         | T35(1)E336(3)006A(4) | 1.6                     | 6                                              |
| 39.0                                                        | F         | T35(1)F396(3)006A(4) | 1.9                     | 6                                              |
| 47.0                                                        | F         | T35(1)F476(3)006A(4) | 2.3                     | 6                                              |
| 56.0                                                        | G         | T35(1)G566(3)006A(4) | 2.7                     | 6                                              |
| 68.0                                                        | G         | T35(1)G686(3)006A(4) | 3.3                     | 6                                              |
| 82.0                                                        | H         | T35(1)H826(3)006A(4) | 3.9                     | 8                                              |
| 100.0                                                       | H         | T35(1)H107(3)006A(4) | 4.8                     | 8                                              |
| 120.0                                                       | J         | T35(2)J127(3)006A(4) | 5.8                     | 8                                              |
| 150.0                                                       | J         | T35(2)J157(3)006A(4) | 7.2                     | 8                                              |
| 180.0                                                       | K         | T35(2)K187(3)006A(4) | 8.6                     | 8                                              |
| 220.0                                                       | K         | T35(2)K227(3)006A(4) | 10.0                    | 8                                              |
| 270.0                                                       | L         | T35(2)L277(3)006A(4) | 10.0                    | 8                                              |
| 330.0                                                       | L         | T35(2)L337(3)006A(4) | 10.0                    | 8                                              |

(1) To complete KEMET Part Number, insert Series Designation as follows: "0" = T350, "1" = T351, "2" = T352, "3" = T353, "4" = T354, "5" = T355, "6" = T356.

(2) To complete KEMET Part Number, insert only Series Designation as follows: "0" = T350, "3" = T353, "4" = T354, "6" = T356.

(3) To complete KEMET Part Number, insert Capacitance Tolerance Symbol: "M" = ±20%, "K" = ±10%.

(4) To complete KEMET Part Number, insert Lead Material designation: S = Sn/Pb (tin/lead) and T = 100% Sn (tin).

NOTE: Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET's option.



# TANTALUM DIPPED / RADIAL — POLAR

## T350, T351, T352, T353, T354, T355 & T356 SERIES “ULTRADIP II”

### T35X

#### RATINGS AND PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                           | CASE<br>SIZE | KEMET PART NUMBER           | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|-------------------------------------------------------------|--------------|-----------------------------|----------------------------|---------------------------------------------------|
| <b>10 VOLT RATING AT 85°C —<br/>7 VOLT RATING AT 125°C</b>  |              |                             |                            |                                                   |
| 2.2                                                         | A            | T35(1)A225(3)010A(4)        | 0.5                        | 5                                                 |
| 2.7                                                         | A            | T35(1)A275(3)010A(4)        | 0.5                        | 5                                                 |
| 3.3                                                         | A            | T35(1)A335(3)010A(4)        | 0.5                        | 5                                                 |
| 3.9                                                         | A            | T35(1)A395(3)010A(4)        | 0.5                        | 5                                                 |
| <b>4.7</b>                                                  | <b>A</b>     | <b>T35(1)A475(3)010A(4)</b> | <b>0.5</b>                 | <b>5</b>                                          |
| 5.6                                                         | B            | T35(1)B565(3)010A(4)        | 0.5                        | 5                                                 |
| 6.8                                                         | B            | T35(1)B685(3)010A(4)        | 0.5                        | 5                                                 |
| 8.2                                                         | C            | T35(1)C825(3)010A(4)        | 0.7                        | 6                                                 |
| 10.0                                                        | C            | T35(1)C106(3)010A(4)        | 0.8                        | 6                                                 |
| 12.0                                                        | E            | T35(1)E126(3)010A(4)        | 1.0                        | 6                                                 |
| 15.0                                                        | E            | T35(1)E156(3)010A(4)        | 1.2                        | 6                                                 |
| 18.0                                                        | E            | T35(1)E186(3)010A(4)        | 1.4                        | 6                                                 |
| 22.0                                                        | E            | T35(1)E226(3)010A(4)        | 1.8                        | 6                                                 |
| 27.0                                                        | F            | T35(1)F276(3)010A(4)        | 2.2                        | 6                                                 |
| <b>33.0</b>                                                 | <b>F</b>     | <b>T35(1)F336(3)010A(4)</b> | <b>2.6</b>                 | <b>6</b>                                          |
| 39.0                                                        | G            | T35(1)G396(3)010A(4)        | 3.1                        | 6                                                 |
| 47.0                                                        | H            | T35(1)H476(3)010A(4)        | 3.8                        | 6                                                 |
| 56.0                                                        | H            | T35(1)H566(3)010A(4)        | 4.5                        | 6                                                 |
| 68.0                                                        | H            | T35(1)H686(3)010A(4)        | 5.4                        | 6                                                 |
| 82.0                                                        | J            | T35(2)J826(3)010A(4)        | 6.6                        | 8                                                 |
| <b>100.0</b>                                                | <b>J</b>     | <b>T35(2)J107(3)010A(4)</b> | <b>8.0</b>                 | <b>8</b>                                          |
| 120.0                                                       | K            | T35(2)K127(3)010A(4)        | 9.6                        | 8                                                 |
| 150.0                                                       | K            | T35(2)K157(3)010A(4)        | 10.0                       | 8                                                 |
| 180.0                                                       | L            | T35(2)L187(3)010A(4)        | 10.0                       | 8                                                 |
| 220.0                                                       | L            | T35(2)L227(3)010A(4)        | 10.0                       | 8                                                 |
| <b>16 VOLT RATING AT 85°C —<br/>10 VOLT RATING AT 125°C</b> |              |                             |                            |                                                   |
| 1.5                                                         | A            | T35(1)A155(3)016A(4)        | 0.5                        | 5                                                 |
| 1.8                                                         | A            | T35(1)A185(3)016A(4)        | 0.5                        | 5                                                 |
| <b>2.2</b>                                                  | <b>A</b>     | <b>T35(1)A225(3)016A(4)</b> | <b>0.5</b>                 | <b>5</b>                                          |
| 2.7                                                         | A            | T35(1)A275(3)016A(4)        | 0.5                        | 5                                                 |
| 3.3                                                         | A            | T35(1)A335(3)016A(4)        | 0.5                        | 5                                                 |
| 3.9                                                         | B            | T35(1)B395(3)016A(4)        | 0.5                        | 5                                                 |
| <b>4.7</b>                                                  | <b>B</b>     | <b>T35(1)B475(3)016A(4)</b> | <b>0.6</b>                 | <b>5</b>                                          |
| 5.6                                                         | C            | T35(1)C565(3)016A(4)        | 0.7                        | 5                                                 |
| 6.8                                                         | C            | T35(1)C685(3)016A(4)        | 0.9                        | 5                                                 |
| 8.2                                                         | E            | T35(1)E825(3)016A(4)        | 1.0                        | 6                                                 |
| <b>10.0</b>                                                 | <b>E</b>     | <b>T35(1)E106(3)016A(4)</b> | <b>1.3</b>                 | <b>6</b>                                          |
| 12.0                                                        | E            | T35(1)E126(3)016A(4)        | 1.5                        | 6                                                 |
| 15.0                                                        | E            | T35(1)E156(3)016A(4)        | 1.8                        | 6                                                 |
| 18.0                                                        | F            | T35(1)F186(3)016A(4)        | 2.2                        | 6                                                 |
| <b>22.0</b>                                                 | <b>F</b>     | <b>T35(1)F226(3)016A(4)</b> | <b>2.6</b>                 | <b>6</b>                                          |
| 27.0                                                        | H            | T35(1)H276(3)016A(4)        | 3.2                        | 6                                                 |
| 33.0                                                        | H            | T35(1)H336(3)016A(4)        | 4.0                        | 6                                                 |
| 39.0                                                        | J            | T35(2)J396(3)016A(4)        | 4.7                        | 6                                                 |
| <b>47.0</b>                                                 | <b>J</b>     | <b>T35(2)J476(3)016A(4)</b> | <b>5.6</b>                 | <b>6</b>                                          |
| 56.0                                                        | K            | T35(2)K566(3)016A(4)        | 6.8                        | 6                                                 |
| <b>68.0</b>                                                 | <b>K</b>     | <b>T35(2)K686(3)016A(4)</b> | <b>8.2</b>                 | <b>6</b>                                          |
| 82.0                                                        | L            | T35(2)L826(3)016A(4)        | 9.8                        | 8                                                 |
| <b>100.0</b>                                                | <b>L</b>     | <b>T35(2)L107(3)016A(4)</b> | <b>10.0</b>                | <b>8</b>                                          |
| 120.0                                                       | M            | T35(2)M127(3)016A(4)        | 10.0                       | 8                                                 |
| 150.0                                                       | M            | T35(2)M157(3)016A(4)        | 10.0                       | 8                                                 |

| CAPACITANCE<br>μF                                             | CASE<br>SIZE | KEMET PART NUMBER           | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------------|--------------|-----------------------------|----------------------------|---------------------------------------------------|
| <b>20 VOLT RATING AT 85°C —<br/>13 VOLT RATING AT 125°C</b>   |              |                             |                            |                                                   |
| 1.0                                                           | A            | T35(1)A105(3)020A(4)        | 0.5                        | 5                                                 |
| 1.2                                                           | A            | T35(1)A125(3)020A(4)        | 0.5                        | 5                                                 |
| 1.5                                                           | A            | T35(1)A155(3)020A(4)        | 0.5                        | 5                                                 |
| 1.8                                                           | A            | T35(1)A185(3)020A(4)        | 0.5                        | 5                                                 |
| 2.2                                                           | A            | T35(1)A225(3)020A(4)        | 0.5                        | 5                                                 |
| 2.7                                                           | B            | T35(1)B275(3)020A(4)        | 0.5                        | 5                                                 |
| 3.3                                                           | B            | T35(1)B335(3)020A(4)        | 0.5                        | 5                                                 |
| 3.9                                                           | C            | T35(1)C395(3)020A(4)        | 0.6                        | 5                                                 |
| 4.7                                                           | C            | T35(1)C475(3)020A(4)        | 0.8                        | 5                                                 |
| 5.6                                                           | D            | T35(1)D565(3)020A(4)        | 0.9                        | 5                                                 |
| 6.8                                                           | D            | T35(1)D685(3)020A(4)        | 1.1                        | 5                                                 |
| 8.2                                                           | E            | T35(1)E825(3)020A(4)        | 1.3                        | 6                                                 |
| 10.0                                                          | E            | T35(1)E106(3)020A(4)        | 1.6                        | 6                                                 |
| 12.0                                                          | F            | T35(1)F126(3)020A(4)        | 1.9                        | 6                                                 |
| 15.0                                                          | F            | T35(1)F156(3)020A(4)        | 2.4                        | 6                                                 |
| 18.0                                                          | G            | T35(1)G186(3)020A(4)        | 2.9                        | 6                                                 |
| 22.0                                                          | G            | T35(1)G226(3)020A(4)        | 3.5                        | 6                                                 |
| 27.0                                                          | J            | T35(2)J276(3)020A(4)        | 4.3                        | 6                                                 |
| 33.0                                                          | J            | T35(2)J336(3)020A(4)        | 5.3                        | 6                                                 |
| 39.0                                                          | K            | T35(2)K396(3)020A(4)        | 6.2                        | 6                                                 |
| 47.0                                                          | K            | T35(2)K476(3)020A(4)        | 7.5                        | 6                                                 |
| 56.0                                                          | L            | T35(2)L566(3)020A(4)        | 9.0                        | 6                                                 |
| 68.0                                                          | L            | T35(2)L686(3)020A(4)        | 10.0                       | 6                                                 |
| 82.0                                                          | M            | T35(2)M826(3)020A(4)        | 10.0                       | 8                                                 |
| <b>100.0</b>                                                  | <b>M</b>     | <b>T35(2)M107(3)020A(4)</b> | <b>10.0</b>                | <b>8</b>                                          |
| <b>25 VOLT RATING AT 85°C —<br/>16.5 VOLT RATING AT 125°C</b> |              |                             |                            |                                                   |
| <b>1.0</b>                                                    | <b>A</b>     | <b>T35(1)A105(3)025A(4)</b> | <b>0.5</b>                 | <b>5</b>                                          |
| 1.2                                                           | A            | T35(1)A125(3)025A(4)        | 0.5                        | 5                                                 |
| 1.5                                                           | A            | T35(1)A155(3)025A(4)        | 0.5                        | 5                                                 |
| 1.8                                                           | A            | T35(1)A185(3)025A(4)        | 0.5                        | 5                                                 |
| <b>2.2</b>                                                    | <b>B</b>     | <b>T35(1)B225(3)025A(4)</b> | <b>0.5</b>                 | <b>5</b>                                          |
| 2.7                                                           | B            | T35(1)B275(3)025A(4)        | 0.5                        | 5                                                 |
| 3.3                                                           | B            | T35(1)B335(3)025A(4)        | 0.7                        | 5                                                 |
| 3.9                                                           | C            | T35(1)C395(3)025A(4)        | 0.8                        | 5                                                 |
| 4.7                                                           | C            | T35(1)C475(3)025A(4)        | 0.9                        | 5                                                 |
| 5.6                                                           | E            | T35(1)E565(3)025A(4)        | 1.1                        | 5                                                 |
| 6.8                                                           | E            | T35(1)E685(3)025A(4)        | 1.4                        | 5                                                 |
| 8.2                                                           | E            | T35(1)E825(3)025A(4)        | 1.6                        | 6                                                 |
| <b>10.0</b>                                                   | <b>E</b>     | <b>T35(1)E106(3)025A(4)</b> | <b>2.0</b>                 | <b>6</b>                                          |
| 12.0                                                          | G            | T35(1)G126(3)025A(4)        | 2.4                        | 6                                                 |
| <b>15.0</b>                                                   | <b>G</b>     | <b>T35(1)G156(3)025A(4)</b> | <b>3.0</b>                 | <b>6</b>                                          |
| 18.0                                                          | H            | T35(1)H186(3)025A(4)        | 3.6                        | 6                                                 |
| <b>22.0</b>                                                   | <b>H</b>     | <b>T35(1)H226(3)025A(4)</b> | <b>4.4</b>                 | <b>6</b>                                          |
| 27.0                                                          | J            | T35(2)J276(3)025A(4)        | 5.4                        | 6                                                 |
| 33.0                                                          | J            | T35(2)J336(3)025A(4)        | 6.6                        | 6                                                 |
| 39.0                                                          | K            | T35(2)K396(3)025A(4)        | 7.8                        | 6                                                 |
| <b>47.0</b>                                                   | <b>K</b>     | <b>T35(2)K476(3)025A(4)</b> | <b>9.4</b>                 | <b>6</b>                                          |
| 56.0                                                          | L            | T35(2)L566(3)025A(4)        | 10.0                       | 6                                                 |
| 68.0                                                          | L            | T35(2)L686(3)025A(4)        | 10.0                       | 6                                                 |

(1) To complete KEMET Part Number, insert Series Designation as follows: "0" = T350, "1" = T351, "2" = T352, "3" = T353, "4" = T354, "5" = T355, "6" = T356.

(2) To complete KEMET Part Number, insert only Series Designation as follows: "0" = T350, "3" = T353, "4" = T354, "6" = T356.

(3) To complete KEMET Part Number, insert Capacitance Tolerance Symbol: "M" = ±20%, "K" = ±10%.

(4) To complete KEMET Part Number, insert Lead Material Designation as follows: S = Sn/Pb (tin/lead) and T = 100% Sn (tin).

NOTE: Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET's option.

**T35X**

**RATINGS AND PART NUMBER REFERENCE**

| CAPACITANCE<br>μF                                           | CASE<br>SIZE | KEMET PART NUMBER           | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|-------------------------------------------------------------|--------------|-----------------------------|----------------------------|---------------------------------------------------|
| <b>35 VOLT RATING AT 85°C —<br/>23 VOLT RATING AT 125°C</b> |              |                             |                            |                                                   |
| 0.10                                                        | A            | T35(1)A104(3)035A(4)        | 0.5                        | 3                                                 |
| 0.12                                                        | A            | T35(1)A124(3)035A(4)        | 0.5                        | 3                                                 |
| 0.15                                                        | A            | T35(1)A154(3)035A(4)        | 0.5                        | 3                                                 |
| 0.18                                                        | A            | T35(1)A184(3)035A(4)        | 0.5                        | 3                                                 |
| 0.22                                                        | A            | T35(1)A224(3)035A(4)        | 0.5                        | 3                                                 |
| 0.27                                                        | A            | T35(1)A274(3)035A(4)        | 0.5                        | 3                                                 |
| 0.33                                                        | A            | T35(1)A334(3)035A(4)        | 0.5                        | 3                                                 |
| 0.39                                                        | A            | T35(1)A394(3)035A(4)        | 0.5                        | 3                                                 |
| 0.47                                                        | A            | T35(1)A474(3)035A(4)        | 0.5                        | 3                                                 |
| 0.56                                                        | A            | T35(1)A564(3)035A(4)        | 0.5                        | 3                                                 |
| 0.68                                                        | A            | T35(1)A684(3)035A(4)        | 0.5                        | 3                                                 |
| 0.82                                                        | A            | T35(1)A824(3)035A(4)        | 0.5                        | 3                                                 |
| <b>1.0</b>                                                  | <b>A</b>     | <b>T35(1)A105(3)035A(4)</b> | <b>0.5</b>                 | <b>3</b>                                          |
| 1.2                                                         | B            | T35(1)B125(3)035A(4)        | 0.5                        | 5                                                 |
| 1.5                                                         | B            | T35(1)B155(3)035A(4)        | 0.5                        | 5                                                 |
| 1.8                                                         | C            | T35(1)C185(3)035A(4)        | 0.5                        | 5                                                 |
| <b>2.2</b>                                                  | <b>C</b>     | <b>T35(1)C225(3)035A(4)</b> | <b>0.6</b>                 | <b>5</b>                                          |
| 2.7                                                         | D            | T35(1)D275(3)035A(4)        | 0.7                        | 5                                                 |
| 3.3                                                         | D            | T35(1)D335(3)035A(4)        | 0.9                        | 5                                                 |
| 3.9                                                         | E            | T35(1)E395(3)035A(4)        | 1.0                        | 5                                                 |
| <b>4.7</b>                                                  | <b>E</b>     | <b>T35(1)E475(3)035A(4)</b> | <b>1.3</b>                 | <b>5</b>                                          |
| 5.6                                                         | F            | T35(1)F565(3)035A(4)        | 1.6                        | 5                                                 |
| <b>6.8</b>                                                  | <b>F</b>     | <b>T35(1)F685(3)035A(4)</b> | <b>1.9</b>                 | <b>5</b>                                          |
| 8.2                                                         | G            | T35(1)G825(3)035A(4)        | 2.3                        | 6                                                 |
| <b>10.0</b>                                                 | <b>G</b>     | <b>T35(1)G106(3)035A(4)</b> | <b>2.8</b>                 | <b>6</b>                                          |
| 12.0                                                        | J            | T35(2)J126(3)035A(4)        | 3.4                        | 6                                                 |
| 15.0                                                        | J            | T35(2)J156(3)035A(4)        | 4.2                        | 6                                                 |
| 18.0                                                        | K            | T35(2)K186(3)035A(4)        | 5.0                        | 6                                                 |
| <b>22.0</b>                                                 | <b>K</b>     | <b>T35(2)K226(3)035A(4)</b> | <b>6.2</b>                 | <b>6</b>                                          |
| 27.0                                                        | L            | T35(2)L276(3)035A(4)        | 7.6                        | 6                                                 |
| 33.0                                                        | L            | T35(2)L336(3)035A(4)        | 9.2                        | 6                                                 |
| 39.0                                                        | M            | T35(2)M396(3)035A(4)        | 10.0                       | 6                                                 |
| <b>47.0</b>                                                 | <b>M</b>     | <b>T35(2)M476(3)035A(4)</b> | <b>10.0</b>                | <b>6</b>                                          |

| CAPACITANCE<br>μF                                           | CASE<br>SIZE | KEMET PART NUMBER           | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|-------------------------------------------------------------|--------------|-----------------------------|----------------------------|---------------------------------------------------|
| <b>50 VOLT RATING AT 85°C —<br/>33 VOLT RATING AT 125°C</b> |              |                             |                            |                                                   |
| 0.10                                                        | A            | T35(1)A104(3)050A(4)        | 0.5                        | 3                                                 |
| 0.12                                                        | A            | T35(1)A124(3)050A(4)        | 0.5                        | 3                                                 |
| 0.15                                                        | A            | T35(1)A154(3)050A(4)        | 0.5                        | 3                                                 |
| 0.18                                                        | A            | T35(1)A184(3)050A(4)        | 0.5                        | 3                                                 |
| 0.22                                                        | A            | T35(1)A224(3)050A(4)        | 0.5                        | 3                                                 |
| 0.27                                                        | A            | T35(1)A274(3)050A(4)        | 0.5                        | 3                                                 |
| 0.33                                                        | A            | T35(1)A334(3)050A(4)        | 0.5                        | 3                                                 |
| 0.39                                                        | B            | T35(1)B394(3)050A(4)        | 0.5                        | 3                                                 |
| 0.47                                                        | B            | T35(1)B474(3)050A(4)        | 0.5                        | 3                                                 |
| 0.56                                                        | B            | T35(1)B564(3)050A(4)        | 0.5                        | 3                                                 |
| 0.68                                                        | B            | T35(1)B684(3)050A(4)        | 0.5                        | 3                                                 |
| 0.82                                                        | B            | T35(1)B824(3)050A(4)        | 0.5                        | 3                                                 |
| <b>1.0</b>                                                  | <b>B</b>     | <b>T35(1)B105(3)050A(4)</b> | <b>0.5</b>                 | <b>3</b>                                          |
| 1.2                                                         | D            | T35(1)D125(3)050A(4)        | 0.5                        | 5                                                 |
| 1.5                                                         | E            | T35(1)E155(3)050A(4)        | 0.6                        | 5                                                 |
| 1.8                                                         | E            | T35(1)E185(3)050A(4)        | 0.7                        | 5                                                 |
| 2.2                                                         | E            | T35(1)E225(3)050A(4)        | 0.9                        | 5                                                 |
| 2.7                                                         | F            | T35(1)F275(3)050A(4)        | 1.1                        | 5                                                 |
| 3.3                                                         | F            | T35(1)F335(3)050A(4)        | 1.3                        | 5                                                 |
| 3.9                                                         | G            | T35(1)G395(3)050A(4)        | 1.6                        | 5                                                 |
| 4.7                                                         | G            | T35(1)G475(3)050A(4)        | 1.9                        | 5                                                 |
| 5.6                                                         | H            | T35(1)H565(3)050A(4)        | 2.2                        | 5                                                 |
| <b>6.8</b>                                                  | <b>J</b>     | <b>T35(2)J685(3)050A(4)</b> | <b>2.7</b>                 | <b>5</b>                                          |
| 8.2                                                         | J            | T35(2)J825(3)050A(4)        | 3.3                        | 6                                                 |
| <b>10.0</b>                                                 | <b>K</b>     | <b>T35(2)K106(3)050A(4)</b> | <b>4.0</b>                 | <b>6</b>                                          |
| 12.0                                                        | K            | T35(2)K126(3)050A(4)        | 4.8                        | 6                                                 |
| 15.0                                                        | L            | T35(2)L156(3)050A(4)        | 6.0                        | 6                                                 |
| 18.0                                                        | L            | T35(2)L186(3)050A(4)        | 7.2                        | 6                                                 |
| 22.0                                                        | M            | T35(2)M226(3)050A(4)        | 8.8                        | 6                                                 |

(1) To complete KEMET Part Number, insert Series Designation as follows: "0" = T350, "1" = T351, "2" = T352, "3" = T353, "4" = T354, "5" = T355, "6" = T356.

(2) To complete KEMET Part Number, insert only Series Designation as follows: "0" = T350, "3" = T353, "4" = T354, "6" = T356.

(3) To complete KEMET Part Number, insert Capacitance Tolerance Symbol: "M" = ±20%, "K" = ±10%.

(4) To complete KEMET Part Number, insert Lead Material Designation as follows: S = Sn/Pb (tin/lead) and T = 100% Tin.

Note: Higher voltage and better capacitance tolerance product may be substituted for an order within the same case size at KEMET's option.

Product manufactured to the requirements of MIL-PRF-49137 satisfy all the performance characteristics of the UltraDip II. The performance characteristics meet or exceed the requirements of MIL-PRF-49137.

In addition to the standard process testing done on the UltraDip II, all product supplied to MIL-PRF-49137 is sampled on a lot by lot

basis for Group A and Group B inspection to insure compliance. Product supplied per MIL-PRF-49137 also receives an additional post process burn-in for at least two (2) hours under accelerated voltage stress in excess of 125% of DC rated voltage. This post process burn-in is equivalent to 200 hours under rated conditions.

### CAPACITOR OUTLINE DRAWINGS



### DIMENSIONS — INCHES & (MILLIMETERS)

**T363 A-D CASE  
T369 A&B CASE ONLY**

| CASE SIZE | D MAX            | H MAX            |
|-----------|------------------|------------------|
| A         | 0.175<br>(4.45)  | 0.350<br>(8.89)  |
| B         | 0.250<br>(6.35)  | 0.450<br>(11.43) |
| C         | 0.350<br>(8.89)  | 0.610<br>(15.49) |
| D         | 0.400<br>(10.16) | 0.740<br>(18.80) |

### MIL-PRF-49137 MARKING INFORMATION



### MIL-PRF-49137/2 ORDERING INFORMATION



| Symbol | Rated (857C)<br>Volts, dc | Surge (857C)<br>Volts, dc |
|--------|---------------------------|---------------------------|
| D      | 6                         | 8                         |
| F      | 10                        | 13                        |
| H      | 15                        | 20                        |
| J      | 20                        | 26                        |
| K      | 25                        | 32                        |
| M      | 35                        | 46                        |
| N      | 50                        | 65                        |

\*For KEMET Ordering Information, see page 63.

#### CAPACITANCE TOLERANCE

| Symbol | Capacitance Tolerance |
|--------|-----------------------|
|        | Percent ( $\pm$ )     |
| K      | 10                    |
| M      | 20                    |

#### CAPACITANCE IN PICOFARAD CODE

The nominal capacitance value, expressed in picofarads (pF), is identified by a three-digit number; the first two digits represent significant figures and the last digit specifies the number of zeros to follow.

## RATINGS &amp; PART NUMBER REFERENCE

| CAPACITANCE<br>μF             | CASE<br>SIZE | CAPACITANCE<br>TOLERANCE<br>±% | T363, T369<br>KEMET<br>PART NUMBER | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz | CX02<br>(T363)<br>MILITARY<br>PART NUMBER | CX12<br>(T369)<br>MILITARY<br>PART NUMBER |
|-------------------------------|--------------|--------------------------------|------------------------------------|----------------------------|---------------------------------------------------|-------------------------------------------|-------------------------------------------|
| <b>6 VOLT RATING AT 85°C</b>  |              |                                |                                    |                            |                                                   |                                           |                                           |
| 6.8                           | A            | 10, 20                         | T36(1)A685(2)006AS                 | 0.5                        | 6                                                 | CX02D685(2)                               | CX12D685(2)                               |
| 47.0                          | B            | 10, 20                         | T36(1)B476(2)006AS                 | 2.3                        | 6                                                 | CX02D476(2)                               | CX12D476(2)                               |
| 68.0                          | B            | 10, 20                         | T36(1)B686(2)006AS                 | 3.3                        | 6                                                 | CX02D686(2)                               | CX12D686(2)                               |
| 150.0                         | C            | 10, 20                         | T363C157(2)006AS                   | 7.2                        | 8                                                 | CX02D157(2)                               |                                           |
| 330.0                         | D            | 10, 20                         | T363D337(2)006AS                   | 10.0                       | 8                                                 | CX02D337(2)                               |                                           |
| <b>10 VOLT RATING AT 85°C</b> |              |                                |                                    |                            |                                                   |                                           |                                           |
| 4.7                           | A            | 10, 20                         | T36(1)A475(2)010AS                 | 0.5                        | 5                                                 | CX02F475(2)                               | CX12F475(2)                               |
| 33.0                          | B            | 10, 20                         | T36(1)B336(2)010AS                 | 2.6                        | 6                                                 | CX02F336(2)                               | CX12F336(2)                               |
| 100.0                         | C            | 10, 20                         | T363C107(2)010AS                   | 8.0                        | 8                                                 | CX02F107(2)                               |                                           |
| 220.0                         | D            | 10, 20                         | T363D227(2)010AS                   | 10.0                       | 8                                                 | CX02F227(2)                               |                                           |
| <b>15 VOLT RATING AT 85°C</b> |              |                                |                                    |                            |                                                   |                                           |                                           |
| 3.3                           | A            | 10, 20                         | T36(1)A335(2)015AS                 | 0.5                        | 5                                                 | CX02H335(2)                               | CX12H335(2)                               |
| 22.0                          | B            | 10, 20                         | T36(1)B226(2)015AS                 | 2.6                        | 6                                                 | CX02H226(2)                               | CX12H226(2)                               |
| 68.0                          | C            | 10, 20                         | T363C686(2)015AS                   | 8.2                        | 6                                                 | CX02H686(2)                               |                                           |
| 150.0                         | D            | 10, 20                         | T363D157(2)015AS                   | 10.0                       | 8                                                 | CX02H157(2)                               |                                           |
| <b>20 VOLT RATING AT 85°C</b> |              |                                |                                    |                            |                                                   |                                           |                                           |
| 2.2                           | A            | 10, 20                         | T36(1)A225(2)020AS                 | 0.5                        | 5                                                 | CX02J225(2)                               | CX12J225(2)                               |
| 15.0                          | B            | 10, 20                         | T36(1)B156(2)020AS                 | 2.4                        | 6                                                 | CX02J156(2)                               | CX12J156(2)                               |
| 47.0                          | C            | 10, 20                         | T363C476(2)020AS                   | 7.5                        | 6                                                 | CX02J476(2)                               |                                           |
| 100.0                         | D            | 10, 20                         | T363D107(2)020AS                   | 10.0                       | 8                                                 | CX02J107(2)                               |                                           |
| <b>25 VOLT RATING AT 85°C</b> |              |                                |                                    |                            |                                                   |                                           |                                           |
| 1.5                           | A            | 10, 20                         | T36(1)A155(2)025AS                 | 0.5                        | 5                                                 | CX02K155(2)                               | CX12K155(2)                               |
| 10.0                          | B            | 10, 20                         | T36(1)B106(2)025AS                 | 2.0                        | 6                                                 | CX02K106(2)                               | CX12K106(2)                               |
| 33.0                          | C            | 10, 20                         | T363C336(2)025AS                   | 6.6                        | 6                                                 | CX02K336(2)                               |                                           |
| 68.0                          | D            | 10, 20                         | T363D686(2)025AS                   | 10.0                       | 6                                                 | CX02K686(2)                               |                                           |
| <b>35 VOLT RATING AT 85°C</b> |              |                                |                                    |                            |                                                   |                                           |                                           |
| 6.8                           | B            | 10, 20                         | T36(1)B685(2)035AS                 | 1.9                        | 5                                                 | CX02M685(2)                               | CX12M685(2)                               |
| 22.0                          | C            | 10, 20                         | T363C226(2)035AS                   | 6.2                        | 6                                                 | CX02M226(2)                               |                                           |
| 33.0                          | D            | 10, 20                         | T363D336(2)035AS                   | 9.2                        | 6                                                 | CX02M336(2)                               |                                           |
| 47.0                          | D            | 10, 20                         | T363D476(2)035AS                   | 10.0                       | 6                                                 | CX02M476(2)                               |                                           |
| <b>50 VOLT RATING AT 85°C</b> |              |                                |                                    |                            |                                                   |                                           |                                           |
| 0.1                           | A            | 10, 20                         | T36(1)A104(2)050AS                 | 0.5                        | 3                                                 | CX02N104(2)                               | CX12N104(2)                               |
| 0.15                          | A            | 10, 20                         | T36(1)A154(2)050AS                 | 0.5                        | 3                                                 | CX02N154(2)                               | CX12N154(2)                               |
| 0.22                          | A            | 10, 20                         | T36(1)A224(2)050AS                 | 0.5                        | 3                                                 | CX02N224(2)                               | CX12N224(2)                               |
| 0.33                          | A            | 10, 20                         | T36(1)A334(2)050AS                 | 0.5                        | 3                                                 | CX02N334(2)                               | CX12N334(2)                               |
| 0.47                          | A            | 10, 20                         | T36(1)A474(2)050AS                 | 0.5                        | 3                                                 | CX02N474(2)                               | CX12N474(2)                               |
| 0.68                          | A            | 10, 20                         | T36(1)A684(2)050AS                 | 0.5                        | 3                                                 | CX02N684(2)                               | CX12N684(2)                               |
| 1.0                           | A            | 10, 20                         | T36(1)A105(2)050AS                 | 0.5                        | 3                                                 | CX02N105(2)                               | CX12N105(2)                               |
| 1.5                           | B            | 10, 20                         | T36(1)B155(2)050AS                 | 0.6                        | 5                                                 | CX02N155(2)                               | CX12N155(2)                               |
| 2.2                           | B            | 10, 20                         | T36(1)B225(2)050AS                 | 0.9                        | 5                                                 | CX02N225(2)                               | CX12N225(2)                               |
| 3.3                           | B            | 10, 20                         | T36(1)B335(2)050AS                 | 1.3                        | 5                                                 | CX02N335(2)                               | CX12N335(2)                               |
| 4.7                           | B            | 10, 20                         | T36(1)B475(2)050AS                 | 1.9                        | 5                                                 | CX02N475(2)                               | CX12N475(2)                               |
| 6.8                           | C            | 10, 20                         | T363C685(2)050AS                   | 2.7                        | 5                                                 | CX02N685(2)                               |                                           |
| 10.0                          | C            | 10, 20                         | T363C106(2)050AS                   | 4.0                        | 6                                                 | CX02N106(2)                               |                                           |
| 15.0                          | C            | 10, 20                         | T363C156(2)050AS                   | 6.0                        | 6                                                 | CX02N156(2)                               |                                           |
| 22.0                          | D            | 10, 20                         | T363D226(2)050AS                   | 8.8                        | 6                                                 | CX02N226(2)                               |                                           |

(1) To complete KEMET part number, insert Series Designation as follows: 3 - T363 (CX02); 9 - T369 (CX12)

(2) To complete KEMET or military part number, insert Capacitance Tolerance Symbol as follows:

M - ±20%, K - ±10%

### T368 CAPACITOR OUTLINE DRAWING



### T368 DIMENSIONS — INCHES + (MILLIMETERS)

| CASE SIZE | TMAX            | WMAX             | HMAX            |
|-----------|-----------------|------------------|-----------------|
| C         | 0.250<br>(6.35) | 0.40<br>(10.16)  | 0.42<br>(10.67) |
| D         | 0.250<br>(6.35) | 0.460<br>(11.68) | 0.52<br>(13.20) |

### T368 RATINGS AND PART NUMBER REFERENCE

| CAPACITANCE<br>μF             | CASE SIZE | KEMET PART NUMBER  | D.C. LEAKAGE<br>μA@25°C | MAX. DISSIPATION FACTOR<br>%@25°C, 120Hz |
|-------------------------------|-----------|--------------------|-------------------------|------------------------------------------|
| <b>6 VOLT RATING AT 85°C</b>  |           |                    |                         |                                          |
| 82.0                          | C         | T368C826(1)006A(2) | 3.9                     | 8                                        |
| 100.0                         | C         | T368C107(1)006A(2) | 4.8                     | 8                                        |
| 120.0                         | C         | T368C127(1)006A(2) | 5.8                     | 8                                        |
| 150.0                         | C         | T368C157(1)006A(2) | 7.2                     | 8                                        |
| 180.0                         | D         | T368D187(1)006A(2) | 8.6                     | 8                                        |
| 220.0                         | D         | T368D227(1)006A(2) | 10.0                    | 8                                        |
| 270.0                         | D         | T368D277(1)006A(2) | 10.0                    | 8                                        |
| 330.0                         | D         | T368D337(1)006A(2) | 10.0                    | 8                                        |
| <b>10 VOLT RATING AT 85°C</b> |           |                    |                         |                                          |
| 47.0                          | C         | T368C476(1)010A(2) | 3.8                     | 6                                        |
| 56.0                          | C         | T368C566(1)010A(2) | 4.4                     | 6                                        |
| 68.0                          | C         | T368C686(1)010A(2) | 5.4                     | 6                                        |
| 82.0                          | C         | T368C826(1)010A(2) | 6.5                     | 8                                        |
| 100.0                         | C         | T368C107(1)010A(2) | 8.0                     | 8                                        |
| 120.0                         | D         | T368D127(1)010A(2) | 9.6                     | 8                                        |
| 150.0                         | D         | T368D157(1)010A(2) | 10.0                    | 8                                        |
| 180.0                         | D         | T368D187(1)010A(2) | 10.0                    | 8                                        |
| 220.0                         | D         | T368D227(1)010A(2) | 10.0                    | 8                                        |
| <b>15 VOLT RATING AT 85°C</b> |           |                    |                         |                                          |
| 27.0                          | C         | T368C276(1)015A(2) | 3.2                     | 6                                        |
| 33.0                          | C         | T368C336(1)015A(2) | 4.0                     | 6                                        |
| 39.0                          | C         | T368C396(1)015A(2) | 4.7                     | 6                                        |
| 47.0                          | C         | T368C476(1)015A(2) | 5.6                     | 6                                        |
| 56.0                          | C         | T368C566(1)015A(2) | 6.8                     | 6                                        |
| 68.0                          | C         | T368C686(1)015A(2) | 8.2                     | 6                                        |
| 82.0                          | D         | T368D826(1)015A(2) | 9.8                     | 8                                        |
| 100.0                         | D         | T368D107(1)015A(2) | 10.0                    | 8                                        |
| 120.0                         | D         | T368D127(1)015A(2) | 10.0                    | 8                                        |
| 150.0                         | D         | T368D157(1)015A(2) | 10.0                    | 8                                        |
| <b>20 VOLT RATING AT 85°C</b> |           |                    |                         |                                          |
| 18.0                          | C         | T368C186(1)020A(2) | 2.8                     | 6                                        |
| 22.0                          | C         | T368C226(1)020A(2) | 3.5                     | 6                                        |
| 27.0                          | C         | T368C276(1)020A(2) | 4.3                     | 6                                        |
| 33.0                          | C         | T368C336(1)020A(2) | 5.3                     | 6                                        |
| 39.0                          | C         | T368C396(1)020A(2) | 6.2                     | 6                                        |
| 47.0                          | C         | T368C476(1)020A(2) | 7.5                     | 6                                        |
| 56.0                          | D         | T368D566(1)020A(2) | 8.9                     | 6                                        |
| 68.0                          | D         | T368D686(1)020A(2) | 10.0                    | 6                                        |
| 82.0                          | D         | T368D826(1)020A(2) | 10.0                    | 8                                        |
| 100.0                         | D         | T368D107(1)020A(2) | 10.0                    | 8                                        |

| CAPACITANCE<br>μF             | CASE SIZE | KEMET PART NUMBER  | D.C. LEAKAGE<br>μA@25°C | MAX. DISSIPATION FACTOR<br>%@25°C, 120Hz |
|-------------------------------|-----------|--------------------|-------------------------|------------------------------------------|
| <b>25 VOLT RATING AT 85°C</b> |           |                    |                         |                                          |
| 12.0                          | C         | T368C126(1)025A(2) | 2.4                     | 6                                        |
| 15.0                          | C         | T368C156(1)025A(2) | 3.0                     | 6                                        |
| 18.0                          | C         | T368C186(1)025A(2) | 3.6                     | 6                                        |
| 22.0                          | C         | T368C226(1)025A(2) | 4.4                     | 6                                        |
| 27.0                          | C         | T368C276(1)025A(2) | 5.4                     | 6                                        |
| 33.0                          | C         | T368C336(1)025A(2) | 6.6                     | 6                                        |
| 39.0                          | D         | T368D396(1)025A(2) | 7.8                     | 6                                        |
| 47.0                          | D         | T368D476(1)025A(2) | 9.4                     | 6                                        |
| 56.0                          | D         | T368D566(1)025A(2) | 10.0                    | 6                                        |
| 68.0                          | D         | T368D686(1)025A(2) | 10.0                    | 6                                        |
| <b>35 VOLT RATING AT 85°C</b> |           |                    |                         |                                          |
| 8.2                           | C         | T368C825(1)035A(2) | 2.3                     | 6                                        |
| 10.0                          | C         | T368C106(1)035A(2) | 2.8                     | 6                                        |
| 12.0                          | C         | T368C126(1)035A(2) | 3.3                     | 6                                        |
| 15.0                          | C         | T368C156(1)035A(2) | 4.2                     | 6                                        |
| 18.0                          | C         | T368C186(1)035A(2) | 5.0                     | 6                                        |
| 22.0                          | C         | T368C226(1)035A(2) | 6.2                     | 6                                        |
| 27.0                          | D         | T368D276(1)035A(2) | 7.5                     | 6                                        |
| 33.0                          | D         | T368D336(1)035A(2) | 9.2                     | 6                                        |
| 39.0                          | D         | T368D396(1)035A(2) | 10.0                    | 6                                        |
| 47.0                          | D         | T368D476(1)035A(2) | 10.0                    | 6                                        |
| <b>50 VOLT RATING AT 85°C</b> |           |                    |                         |                                          |
| 5.6                           | C         | T368C565(1)050A(2) | 2.2                     | 5                                        |
| 6.8                           | C         | T368C685(1)050A(2) | 2.7                     | 5                                        |
| 8.2                           | C         | T368C825(1)050A(2) | 3.2                     | 6                                        |
| 10.0                          | C         | T368C106(1)050A(2) | 4.0                     | 6                                        |
| 12.0                          | C         | T368C126(1)050A(2) | 4.8                     | 6                                        |
| 15.0                          | C         | T368C156(1)050A(2) | 6.0                     | 6                                        |
| 18.0                          | D         | T368D186(1)050A(2) | 7.2                     | 6                                        |
| 22.0                          | D         | T368D226(1)050A(2) | 8.8                     | 6                                        |

- (1) To complete KEMET part number, insert capacitance tolerance K— ±10%, M— ±20%, or J— ±5% (Available on special order).
- (2) To complete KEMET part number, insert lead material designation: S = SnPb (tin/lead) and T = 100% Sn (tin).

**\* For Ordering and Marking Information refer to page 63.**

**Effective June 30, 2005 T368 Series is RoHS Compliant.**

# TANTALUM DIPPED / 3 LEADED

## T396 & T398 SERIES "ULTRADIP III"



KEMET UltraDip III Capacitors offer the advantages of solid tantalum construction and a "fail-safe" insertion mechanism. The three-leaded design (the anode is in the center) enables operators to insert the capacitors into printed circuit boards correctly without having to visually determine polarity. This timesaving device also eliminates board damage that may result from incorrect insertion.

The UltraDip III Series features a capacitance range of 0.1 to 680  $\mu$ F at 3 to 50 VDC. These miniature dipped solid tantalum capacitors are encased in a tough plastic barrier coating that maintains the pre-

cise lead wire spacing within  $\pm 0.015$  inch. The gold color epoxy permits laser markings with outstanding permanency and legibility. All case sizes are printed with capacitance, voltage and vendor I.D.

The UltraDip III Series from KEMET Capacitors exhibit low DCL, ESR and Impedance and have excellent temperature stability. These capacitors may be ordered with precut leads (see drawing for lengths) or in KEMET Capacitor ARIS packaging (leads taped and on reels) for high speed automatic insertion equipment.

Effective June 30, 2005 the T396 and T398 Series are RoHS Compliant.

## CAPACITOR OUTLINE DRAWING



## DIMENSIONS—INCHES & (MILLIMETERS)

| Series    | Case Size | Both       |                | T396         | T398         |
|-----------|-----------|------------|----------------|--------------|--------------|
|           |           | W<br>Width | T<br>Thickness | H*<br>Height | H*<br>Height |
| T396/T398 | A         | .280 (7.1) | .190 (4.8)     | .310 (7.9)   | .355 (9.0)   |
| T396/T398 | B         | .280 (7.1) | .190 (4.8)     | .320 (8.1)   | .365 (9.3)   |
| T396/T398 | C         | .280 (7.1) | .200 (5.1)     | .360 (9.1)   | .390 (9.9)   |
| T396/T398 | D         | .280 (7.1) | .200 (5.1)     | .370 (9.4)   | .390 (9.9)   |
| T396/T398 | E         | .280 (7.1) | .230 (5.8)     | .380 (9.7)   | .415 (10.5)  |
| T396/T398 | F         | .280 (7.1) | .240 (6.1)     | .410 (10.4)  | .430 (10.9)  |
| T396/T398 | G         | .280 (7.1) | .250 (6.3)     | .420 (10.7)  | .440 (11.2)  |
| T396/T398 | H         | .280 (7.1) | .270 (6.9)     | .420 (10.7)  | .440 (11.2)  |
| T396/T398 | J         | .300 (7.6) | .300 (7.6)     | .460 (11.7)  | .480 (12.2)  |
| T396/T398 | K         | .340 (8.6) | .340 (8.6)     | .500 (12.7)  | .500 (12.7)  |
| T396/T398 | L         | .340 (8.6) | .340 (8.6)     | .560 (14.2)  | .580 (14.7)  |
| T396/T398 | M         | .360 (9.1) | .360 (9.1)     | .620 (15.7)  | .620 (15.7)  |

\*NOTE: "H" dimensions are from seating plane to top of capacitor.

## CAPACITOR MARKING



## ORDERING INFORMATION





# TANTALUM DIPPED / 3 LEADED —POLAR

T396 & T398 SERIES “ULTRADIP III”

## RATINGS & PART NUMBER REFERENCE

| CAPACITANCE<br>μF                                           | CASE<br>SIZE | KEMET PART NUMBER    | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|-------------------------------------------------------------|--------------|----------------------|----------------------------|---------------------------------------------------|
| <b>3 VOLT RATING AT 85°C —<br/>2 VOLT RATING AT 125°C</b>   |              |                      |                            |                                                   |
| 4.7                                                         | A            | T39(1)A475(2)003A(3) | 0.5                        | 5                                                 |
| 6.8                                                         | A            | T39(1)A685(2)003A(3) | 0.5                        | 5                                                 |
| 10.0                                                        | A            | T39(1)A106(2)003A(3) | 0.5                        | 6                                                 |
| 15.0                                                        | B            | T39(1)B156(2)003A(3) | 0.5                        | 6                                                 |
| 22.0                                                        | C            | T39(1)C226(2)003A(3) | 0.5                        | 6                                                 |
| 33.0                                                        | D            | T39(1)D336(2)003A(3) | 0.8                        | 6                                                 |
| 47.0                                                        | E            | T39(1)E476(2)003A(3) | 1.1                        | 6                                                 |
| 68.0                                                        | F            | T39(1)F686(2)003A(3) | 1.6                        | 6                                                 |
| 100.0                                                       | G            | T39(1)G107(2)003A(3) | 2.4                        | 8                                                 |
| 150.0                                                       | H            | T39(1)H157(2)003A(3) | 3.6                        | 8                                                 |
| 220.0                                                       | J            | T39(1)J227(2)003A(3) | 5.3                        | 8                                                 |
| 330.0                                                       | K            | T39(1)K337(2)003A(3) | 7.9                        | 8                                                 |
| 470.0                                                       | L            | T39(1)L477(2)003A(3) | 10.0                       | 9                                                 |
| 680.0                                                       | M            | T39(1)M687(2)003A(3) | 10.0                       | 9                                                 |
| <b>10 VOLT RATING AT 85°C —<br/>7 VOLT RATING AT 125°C</b>  |              |                      |                            |                                                   |
| 2.2                                                         | A            | T39(1)A225(2)010A(3) | 0.5                        | 5                                                 |
| 3.3                                                         | A            | T39(1)A335(2)010A(3) | 0.5                        | 5                                                 |
| 4.7                                                         | A            | T39(1)A475(2)010A(3) | 0.5                        | 5                                                 |
| 6.8                                                         | B            | T39(1)B685(2)010A(3) | 0.5                        | 5                                                 |
| 10.0                                                        | C            | T39(1)C106(2)010A(3) | 0.8                        | 6                                                 |
| 15.0                                                        | E            | T39(1)E156(2)010A(3) | 1.2                        | 6                                                 |
| 22.0                                                        | E            | T39(1)E226(2)010A(3) | 1.8                        | 6                                                 |
| 33.0                                                        | F            | T39(1)F336(2)010A(3) | 2.6                        | 6                                                 |
| 47.0                                                        | H            | T39(1)H476(2)010A(3) | 3.8                        | 6                                                 |
| 68.0                                                        | H            | T39(1)H686(2)010A(3) | 5.4                        | 6                                                 |
| 100.0                                                       | J            | T39(1)J107(2)010A(3) | 8.0                        | 8                                                 |
| 150.0                                                       | K            | T39(1)K157(2)010A(3) | 10.0                       | 8                                                 |
| 220.0                                                       | I            | T39(1)L227(2)010A(3) | 10.0                       | 8                                                 |
| <b>20 VOLT RATING AT 85°C —<br/>13 VOLT RATING AT 125°C</b> |              |                      |                            |                                                   |
| 1.0                                                         | A            | T39(1)A105(2)020A(3) | 0.5                        | 3                                                 |
| 1.5                                                         | A            | T39(1)A155(2)020A(3) | 0.5                        | 5                                                 |
| 2.2                                                         | A            | T39(1)A225(2)020A(3) | 0.5                        | 5                                                 |
| 3.3                                                         | B            | T39(1)B335(2)020A(3) | 0.5                        | 5                                                 |
| 4.7                                                         | C            | T39(1)C475(2)020A(3) | 0.8                        | 5                                                 |
| 6.8                                                         | D            | T39(1)D685(2)020A(3) | 1.1                        | 5                                                 |
| 10.0                                                        | E            | T39(1)E106(2)020A(3) | 1.6                        | 6                                                 |
| 15.0                                                        | F            | T39(1)F156(2)020A(3) | 2.4                        | 6                                                 |
| 22.0                                                        | G            | T39(1)G226(2)020A(3) | 3.5                        | 6                                                 |
| 33.0                                                        | J            | T39(1)J336(2)020A(3) | 5.3                        | 6                                                 |
| 47.0                                                        | K            | T39(1)K476(2)020A(3) | 7.5                        | 6                                                 |
| 68.0                                                        | L            | T39(1)L686(2)020A(3) | 10.0                       | 6                                                 |
| 100.0                                                       | M            | T39(1)M107(2)020A(3) | 10.0                       | 8                                                 |
| <b>35 VOLT RATING AT 85°C —<br/>23 VOLT RATING AT 125°C</b> |              |                      |                            |                                                   |
| 0.10                                                        | A            | T39(1)A104(2)035A(3) | 0.5                        | 3                                                 |
| 0.15                                                        | A            | T39(1)A154(2)035A(3) | 0.5                        | 3                                                 |
| 0.22                                                        | A            | T39(1)A224(2)035A(3) | 0.5                        | 3                                                 |
| 0.33                                                        | A            | T39(1)A334(2)035A(3) | 0.5                        | 3                                                 |
| 0.47                                                        | A            | T39(1)A474(2)035A(3) | 0.5                        | 3                                                 |
| 0.68                                                        | A            | T39(1)A684(2)035A(3) | 0.5                        | 3                                                 |
| 1.0                                                         | A            | T39(1)A105(2)035A(3) | 0.5                        | 3                                                 |
| 1.5                                                         | B            | T39(1)B155(2)035A(3) | 0.5                        | 5                                                 |
| 2.2                                                         | C            | T39(1)C225(2)035A(3) | 0.6                        | 5                                                 |
| 3.3                                                         | D            | T39(1)D335(2)035A(3) | 0.9                        | 5                                                 |
| 4.7                                                         | E            | T39(1)E475(2)035A(3) | 1.3                        | 5                                                 |
| 6.8                                                         | F            | T39(1)F685(2)035A(3) | 1.9                        | 5                                                 |
| 10.0                                                        | G            | T39(1)G106(2)035A(3) | 2.8                        | 6                                                 |
| 15.0                                                        | J            | T39(1)J156(2)035A(3) | 4.2                        | 6                                                 |
| 22.0                                                        | K            | T39(1)K226(2)035A(3) | 6.2                        | 6                                                 |
| 33.0                                                        | L            | T39(1)L336(2)035A(3) | 9.2                        | 6                                                 |
| 47.0                                                        | M            | T39(1)M476(2)035A(3) | 10.0                       | 6                                                 |

| CAPACITANCE<br>μF                                             | CASE<br>SIZE | KEMET PART NUMBER    | D.C.<br>LEAKAGE<br>μA@25°C | MAX.<br>DISSIPATION<br>FACTOR<br>%@25°C,<br>120Hz |
|---------------------------------------------------------------|--------------|----------------------|----------------------------|---------------------------------------------------|
| <b>6.3 VOLT RATING AT 85°C —<br/>4 VOLT RATING AT 125°C</b>   |              |                      |                            |                                                   |
| 3.3                                                           | A            | T39(1)A335(2)006A(3) | 0.5                        | 5                                                 |
| 4.7                                                           | A            | T39(1)A475(2)006A(3) | 0.5                        | 5                                                 |
| 6.8                                                           | A            | T39(1)A685(2)006A(3) | 0.5                        | 5                                                 |
| 10.0                                                          | B            | T39(1)B106(2)006A(3) | 0.5                        | 6                                                 |
| 15.0                                                          | C            | T39(1)C156(2)006A(3) | 0.7                        | 6                                                 |
| 22.0                                                          | D            | T39(1)D226(2)006A(3) | 1.1                        | 6                                                 |
| 33.0                                                          | E            | T39(1)E336(2)006A(3) | 1.6                        | 6                                                 |
| 47.0                                                          | F            | T39(1)F476(2)006A(3) | 2.3                        | 6                                                 |
| 68.0                                                          | G            | T39(1)G686(2)006A(3) | 3.3                        | 6                                                 |
| 100.0                                                         | H            | T39(1)H107(2)006A(3) | 4.8                        | 8                                                 |
| 150.0                                                         | J            | T39(1)J157(2)006A(3) | 7.2                        | 8                                                 |
| 220.0                                                         | K            | T39(1)K227(2)006A(3) | 10.0                       | 8                                                 |
| 330.0                                                         | L            | T39(1)L337(2)006A(3) | 10.0                       | 8                                                 |
| <b>16 VOLT RATING AT 85°C —<br/>10 VOLT RATING AT 125°C</b>   |              |                      |                            |                                                   |
| 1.5                                                           | A            | T39(1)A155(2)016A(3) | 0.5                        | 5                                                 |
| 2.2                                                           | A            | T39(1)A225(2)016A(3) | 0.5                        | 5                                                 |
| 3.3                                                           | A            | T39(1)A335(2)016A(3) | 0.5                        | 5                                                 |
| 4.7                                                           | B            | T39(1)B475(2)016A(3) | 0.6                        | 5                                                 |
| 6.8                                                           | C            | T39(1)C685(2)016A(3) | 0.9                        | 5                                                 |
| 10.0                                                          | E            | T39(1)E106(2)016A(3) | 1.3                        | 6                                                 |
| 15.0                                                          | E            | T39(1)E156(2)016A(3) | 1.8                        | 6                                                 |
| 22.0                                                          | F            | T39(1)F226(2)016A(3) | 2.6                        | 6                                                 |
| 33.0                                                          | H            | T39(1)H336(2)016A(3) | 4.0                        | 6                                                 |
| 47.0                                                          | J            | T39(1)J476(2)016A(3) | 5.6                        | 6                                                 |
| 68.0                                                          | K            | T39(1)K686(2)016A(3) | 8.2                        | 6                                                 |
| 100.0                                                         | L            | T39(1)L107(2)016A(3) | 10.0                       | 8                                                 |
| 150.0                                                         | M            | T39(1)M157(2)016A(3) | 10.0                       | 8                                                 |
| <b>25 VOLT RATING AT 85°C —<br/>16.5 VOLT RATING AT 125°C</b> |              |                      |                            |                                                   |
| 1.0                                                           | A            | T39(1)A105(2)025A(3) | 0.5                        | 3                                                 |
| 1.5                                                           | A            | T39(1)A155(2)025A(3) | 0.5                        | 5                                                 |
| 2.2                                                           | B            | T39(1)B225(2)025A(3) | 0.5                        | 5                                                 |
| 3.3                                                           | B            | T39(1)B335(2)025A(3) | 0.7                        | 5                                                 |
| 4.7                                                           | C            | T39(1)C475(2)025A(3) | 0.9                        | 5                                                 |
| 6.8                                                           | E            | T39(1)E685(2)025A(3) | 1.4                        | 5                                                 |
| 10.0                                                          | E            | T39(1)E106(2)025A(3) | 2.0                        | 6                                                 |
| 15.0                                                          | G            | T39(1)G156(2)025A(3) | 3.0                        | 6                                                 |
| 22.0                                                          | H            | T39(1)H226(2)025A(3) | 4.4                        | 6                                                 |
| 33.0                                                          | J            | T39(1)J336(2)025A(3) | 6.6                        | 6                                                 |
| 47.0                                                          | K            | T39(1)K476(2)025A(3) | 9.4                        | 6                                                 |
| 68.0                                                          | L            | T39(1)L686(2)025A(3) | 10.0                       | 6                                                 |
| <b>50 VOLT RATING AT 85°C —<br/>33 VOLT RATING AT 125°C</b>   |              |                      |                            |                                                   |
| 0.10                                                          | A            | T39(1)A104(2)050A(3) | 0.5                        | 3                                                 |
| 0.15                                                          | A            | T39(1)A154(2)050A(3) | 0.5                        | 3                                                 |
| 0.22                                                          | A            | T39(1)A224(2)050A(3) | 0.5                        | 3                                                 |
| 0.33                                                          | A            | T39(1)A334(2)050A(3) | 0.5                        | 3                                                 |
| 0.47                                                          | B            | T39(1)B474(2)050A(3) | 0.5                        | 3                                                 |
| 0.68                                                          | B            | T39(1)B684(2)050A(3) | 0.5                        | 3                                                 |
| 1.0                                                           | B            | T39(1)B105(2)050A(3) | 0.5                        | 3                                                 |
| 1.5                                                           | E            | T39(1)E155(2)050A(3) | 0.6                        | 5                                                 |
| 2.2                                                           | E            | T39(1)E225(2)050A(3) | 0.9                        | 5                                                 |
| 3.3                                                           | F            | T39(1)F335(2)050A(3) | 1.3                        | 5                                                 |
| 4.7                                                           | G            | T39(1)G475(2)050A(3) | 1.9                        | 5                                                 |
| 6.8                                                           | J            | T39(1)J685(2)050A(3) | 2.7                        | 5                                                 |
| 10.0                                                          | K            | T39(1)K106(2)050A(3) | 4.0                        | 6                                                 |
| 15.0                                                          | L            | T39(1)L156(2)050A(3) | 6.0                        | 6                                                 |
| 22.0                                                          | M            | T39(1)M226(2)050A(3) | 8.8                        | 6                                                 |

(1) To complete KEMET Part Number, insert Series Designation as follows: "6" = T396, "8" = T398.

(2) To complete KEMET Part Number, insert Capacitance Tolerance Symbol as follows: "M" = ±20%, "K" = ±10%.

(3) To complete KEMET Part Number, insert Lead Material Designation: S = SnPb (tin/lead) and T = 100% Sn (tin).

NOTE: Higher voltage/higher tolerance products may be shipped, at KEMET's option, within the same case size.

## Tantalum Axial Lead Tape and Reel Packaging

KEMET offers standard reeling of Solid Tantalum Capacitors for automatic insertion or lead forming machines per EIA Specification RS-296E.



Figure 1



Figure 2



Figure 3

Table 1 Dimensions in Inches & (Millimeters)

| COMPONENT<br>BODY DIAMETER       | COMPONENT<br>PITCH "A"           | INSIDE TAPE SPACING<br>"B" $\pm 1.5\text{mm}$ (0.059") |          |        |
|----------------------------------|----------------------------------|--------------------------------------------------------|----------|--------|
|                                  | 0.020" or ( $\pm 0.5\text{mm}$ ) | I                                                      | II       | III    |
| 0" (0mm) to 0.197" (5mm)         | 0.200" or (5mm)                  | 2.062"                                                 | 2.500"   | 2.874" |
| 0.197" (5.01mm) to 0.394" (10mm) | 0.400" or (10mm)                 | (52.4mm)                                               | (63.5mm) | (73mm) |

Capacitors are reeled so that positive leads are oriented as shown in Figure 3. Kraft paper (50lb. test minimum) is inserted between the layers of capacitors wound on reels for component pitch  $\leq 0.200$ " sizes and corrugated paper (70 lb. test minimum), single faced is inserted for component pitch  $\geq 0.400$ " sizes. Capacitor lead length may extend only a maximum of .031" (0.8 mm) beyond the tape's edges. Capacitors are centered in a row between the two tapes and will deviate only  $\pm 0.031$ " (0.79 mm) from the row center. Figures 1 and 2 show the KEMET standard chipboard tape reel. A minimum of 36" (91.5 cm) leader tape is provided at each end of the reeled capacitors. Universal splicing clips are used to connect the tape. Standard reel quantities are shown on page 73.

KEMET offers Solid Tantalum Capacitors fully compatible for use with automatic insertion machines for radial-lead components. Aris Reeling meets all requirements of EIA Standard RS-468. KEMET capacitors are wound on a precision made ARIS Reel Package. ARIS Ammo Package is also available.

## Tantalum Dipped Radial – ARIS Specification (Automatic Radial Insertion System)

### Tantalum Dipped Tape and Reel Dimensions in Millimeters & (Inches)

| Dimension                          | Symbol         | Nominal mm (inch)                     | Tolerance mm (inch)                | Dimension                                    | Symbol         | Nominal mm (inch)         | Tolerance mm (inch)        |
|------------------------------------|----------------|---------------------------------------|------------------------------------|----------------------------------------------|----------------|---------------------------|----------------------------|
| Body Height (1)                    | A              | 17.0 (0.67)                           | Maximum                            | Component Pitch (5)                          | P              | 12.7 (.500)               | ± 1.0 (± .039)             |
| Body Width (1)                     | A <sub>1</sub> | 10.2 (0.40)                           | Maximum                            | Sprocket Hole Pitch (2)                      | P <sub>0</sub> | 12.7 (.500)               | ± 0.3 (± .012)             |
| Sprocket Hole Diameter             | D <sub>0</sub> | 4.0 (.157)                            | ± 0.3 (± .012)                     | Sprocket Hole Center to Lead Center (3) (4)  | P <sub>1</sub> | See Note Below            | ± 0.7 (± .028)             |
| Lead Diameter                      | d              | 0.51 or 0.64 (.020) (.025)            | ± 0.05 (.002)                      | Sprocket Hole Center to Component (5) Center | P <sub>2</sub> | See Note Below            |                            |
| Lead Center (4)                    | F              | See Note Below                        |                                    | Body Thickness                               | T <sub>0</sub> | 10.2 (.400)               | Maximum                    |
| Component Base to Tape Center (4)  | H              | C-7301 16.0 (.630) C-7303 18.0 (.709) | C-7301 ±0.5 (±.020) C-7303 Minimum | Total Tape Thickness                         | T              | 0.7 (0.28)                | ± .02 (.008)               |
| Lead Standoff Height               | H <sub>0</sub> | C-7301 16.0 (.630) C-7303 18.0 (.709) | C-7301 ±0.5 (±.020) C-7303 Minimum | Carrier Tape Width                           | W              | 18.0 (.709)               | + 1.0/-0.5 (+.039/- .020)  |
| Component Height Above Tape Center | H <sub>1</sub> | 32.25 (1.270)                         | Maximum                            | Hold-Down Tape Width                         | W <sub>0</sub> | 15mm or 6mm (.561) (.236) | + 1.0/-0.8 (+.039/- .031)  |
| Component Alignment Front to Rear  | Δ H            | 0                                     | 1.0 (.039)                         | Sprocket Hole Location                       | W <sub>1</sub> | 9.0 (.354)                | + .075/-0.5 (+.030/- .020) |
| Cut Out Length                     | L              | 11.0 (.433)                           | Maximum                            | Hold-Down Tape Location                      | W <sub>2</sub> | 12mm (.472)               | Maximum                    |
| Lead Protrusion                    | L <sub>1</sub> | 1.0 (.039)                            | Maximum                            |                                              |                |                           |                            |

Notes: (1) See page 62 for T35X and page 69 for T39X specific dimensions.  
(2) Cumulative pitch error ± 1.0mm (.039") maximum in 20 consecutive sprocket hole locations.  
(3) Measured at bottom of standoff.  
(4) P<sub>1</sub> and F measured at egress from carrier tape.  
(5) P and P<sub>2</sub> measured at egress from carrier tape.

On polar devices, the positive (+) lead exits from container first.  
\* Lead spacings are 2.5mm (.098") center-to-center (T350 A-H)  
\*\* Lead spacings are 5.0mm (.197") center-to-center  
# Lead spacings are 6.35mm (.25") center-to-center  
+ Lead spacings are 3.18mm (.125") center-to-center

| F Dimensions:            | P1 Dimensions:                    |
|--------------------------|-----------------------------------|
| 0.100" ± .015            | Lead                              |
| 0.125" ± .015            | Spacing                           |
| 0.200" ± .015            | 0.100" - 0.200 ± .028"            |
| 0.250" ± .015"           | 0.125" - 0.187 ± .028"            |
| 0.100" ± .015 (3 leaded) | 0.200" - 0.150 ± .028"            |
|                          | 0.250" - 0.125 ± .028"            |
|                          | 0.100" - 0.100 ± .028" (3 leaded) |

- ① T396/8\*
- ② T350/1\*
- ③ T352/3/6\*\*
- ④ T354#
- ⑤ T355+



## Tantalum Molded Radial – ARIS Specification (Automatic Radial Insertion System)

### Tantalum Molded Tape and Reel Dimensions in Millimeters & (Inches)

| Dimension                               | Symbol         | Nominal mm (inch)          | Tolerance mm (inch)         | Dimension                                   | Symbol         | Nominal mm (inch)                  | Tolerance mm (inch)        |
|-----------------------------------------|----------------|----------------------------|-----------------------------|---------------------------------------------|----------------|------------------------------------|----------------------------|
| Body Height (1)                         | A              | 10.50 (.413)               | ± .38 (±.015) Maximum       | Component Pitch (5)                         | P              | 12.7 (.500)                        | ± 1.0 (± .039)             |
| Body Width (1)                          | A <sub>1</sub> | 15.24 (.600)               | Maximum ± .38 (± .015)      | Sprocket Hole Pitch (3)                     | P <sub>0</sub> | 12.7 (.500)                        | ± 0.3 (± .012)             |
| Sprocket Hole Diameter                  | D <sub>0</sub> | 4.0 (.157)                 | ± 0.3 (± .012)              | Sprocket Hole Center to Lead Center (4) (5) | P <sub>1</sub> | 3.85 4.76 5.1 (.152) (.188) (.201) | ± 0.7 (± .028)             |
| Lead Diameter                           | d              | 0.51 or 0.64 (.020) (.025) | ± 0.05 or ± .03 (± .001)    | Sprocket Hole Center to Component Center    | P <sub>2</sub> | 6.35 (.250)                        | ± 1.3 (± .051)             |
| Lead Center (5)                         | F              | 5.0 2.5 (.197) (.098)      | + 0.8/- 0.2 (+ .032/- .008) | Body Thickness                              | T <sub>0</sub> | 6.35 (.250)                        | ± 1.3 Maximum              |
| Component Base to Tape Center (2)(4)(6) | H              | 16.0 - 21.0 (.630 - .827)  | Reference Only              | Total Tape Thickness                        | T              | 0.7 (0.28)                         | ± .02 (± .008)             |
| Lead Standoff Height                    | H <sub>0</sub> | N/A                        |                             | Carrier Tape Width                          | W              | 18.0 (.709)                        | + 1.0/-0.5 (+.039/- .020)  |
| Component Height Above Tape Center      | H <sub>1</sub> | 32.25 (1.270)              | Maximum                     | Hold-Down Tape Width                        | W <sub>0</sub> | 15 or 6 (.561) (.236)              | + 1.0/-0.8 (+.039/.031)    |
| Component Alignment Front to Rear       | Δ H            | 0                          | ± 2.0 (± .079)              | Sprocket Hole Location                      | W <sub>1</sub> | 9.0 (.354)                         | + .075/-0.5 (+.030/- .020) |
| Cut Out Length                          | L              | 11.0 (.433)                | Maximum                     | Hold-Down Tape Location                     | W <sub>2</sub> | 3.0 or 12.0 (.118) (.472)          | Maximum                    |
| Lead Protrusion                         | L <sub>1</sub> | 2.0 (.079)                 | Maximum                     |                                             |                |                                    |                            |

Notes: (1) See page 50 for T330, page 53 for T340 and page 59 for T35X specific dimensions.  
(2) Reference Only  
(3) Cumulative pitch error ± 1.0mm (.039") maximum in 20 consecutive sprocket hole locations.  
(4) Measured at bottom of standoff.  
(5) P, P<sub>1</sub> and F measured at egress from carrier tape.  
(6) H dimensions for T370 D and E 16.5mm ± 0.5mm (0.650" ± 0.020")

On polar devices, the positive (+) lead exits from container first.  
\* Lead spacings are 2.5mm (.098") center to center  
\*\* Lead spacings are 5.0mm (.197") center-to-center.

- ① T370
- ② T340\*\*
- ③ T330\*\*



## TANTALUM PACKAGING

| KEMET(1)<br>Number                                         | Military<br>Style                | Military<br>Specification                                        | Case<br>Size                                           | Standard<br>Bulk(2)<br>Quantity                                                | Standard<br>Reel<br>Quantity                                                     | Reel<br>Size                                                              | Standard<br>Reeling<br>Spec.                                                                                                                                      | Ammo<br>Pack<br>Quantity                                                          | Ammo<br>Pack<br>Spec.                                                                            |
|------------------------------------------------------------|----------------------------------|------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| T110/T212,<br>T140/T242,<br>T252,<br>T262                  | CSR13<br>CSR23<br>CSR33<br>CSR21 | MIL-C-39003/1<br>MIL-C-39003/3<br>MIL-C-39003/6<br>MIL-C-39003/9 | A<br>B<br>C<br>D                                       | 150/Box<br>75/Box<br>20/Tray<br>20/Tray                                        | 3500<br>2500<br>500<br>400                                                       | 12"<br>12"<br>12"<br>12"                                                  | C-7200<br>C-7200<br>C-7200<br>C-7200                                                                                                                              | 1500<br>1000<br>250<br>250                                                        | C-7293<br>Class I<br>C-7442<br>Class II<br>C-7443<br>Class III<br>See Page 71<br>for class info. |
| T111/T213                                                  | CSR91                            | MIL-C-39003/4                                                    | A<br>B<br>C<br>D                                       | 60/Box<br>30/Box<br>10/Card<br>10/Card                                         | 3000<br>2000<br>N/A<br>N/A                                                       | 12"<br>12"<br>N/A<br>N/A                                                  | C-7200<br>C-7200<br>N/A<br>N/A                                                                                                                                    | N/A                                                                               | N/A                                                                                              |
| T210,<br>T216,<br>T240,<br>T256                            | CSS13<br>CSS33                   | MIL-C-39003/10<br>MIL-C-39003/10                                 | A<br>B<br>C<br>D                                       | 40/Tray<br>30/Tray<br>20/Tray<br>20/Tray                                       | 3500<br>2500<br>500<br>400                                                       | 12"<br>12"<br>12"<br>12"                                                  | C-7200<br>C-7200<br>C-7200<br>C-7200                                                                                                                              | N/A<br>N/A<br>N/A<br>N/A                                                          | N/A<br>N/A<br>N/A<br>N/A                                                                         |
| T222                                                       | CSR09                            | MIL-C-39003/2                                                    | A/B<br>A<br>B                                          | 50/Tray<br>300/Box<br>150/Box                                                  | N/A<br>N/A                                                                       | N/A<br>N/A                                                                | N/A<br>N/A                                                                                                                                                        | N/A<br>N/A                                                                        | N/A                                                                                              |
| T322/T323                                                  | CX01,<br>CX05                    | MIL-C-49137/1 & 5                                                | A<br>B<br>C<br>D<br>E<br>F                             | 300<br>250<br>100<br>100<br>100<br>100                                         | 4500<br>4000<br>2500<br>2500<br>500<br>500                                       | 12"<br>12"<br>12"<br>12"<br>12"<br>12"                                    | C-7200<br>C-7200<br>C-7200<br>C-7200<br>C-7200<br>C-7200                                                                                                          | 2000<br>2000<br>1000<br>1000<br>250<br>250                                        | C-7293<br>Class I<br>C-7442<br>Class II<br>C-7443<br>Class III<br>See Page 71                    |
| T330                                                       |                                  |                                                                  | A<br>B<br>C<br>D                                       | 400<br>300<br>200<br>100                                                       | 1000<br>1000<br>1000<br>N/A                                                      | 12"<br>12"<br>12"<br>N/A                                                  | C-7301<br>C-7301<br>C-7301<br>N/A                                                                                                                                 | 1600<br>1200<br>1200<br>N/A                                                       |                                                                                                  |
| T340                                                       |                                  |                                                                  | A<br>B<br>C<br>D<br>E<br>F                             | 300<br>300<br>200<br>100<br>50<br>100                                          | 1000<br>1000<br>1000<br>250<br>150<br>N/A                                        | 12"<br>12"<br>12"<br>12"<br>12"<br>N/A                                    | C-7301<br>C-7301<br>C-7301<br>C-7301<br>C-7301<br>N/A                                                                                                             | 1600<br>1500<br>1500<br>450<br>N/A<br>N/A                                         |                                                                                                  |
| T350,<br>T351,<br>T352,<br>T353,<br>T354,<br>T355,<br>T356 |                                  |                                                                  | A<br>B<br>C<br>D<br>E<br>F<br>G<br>H<br>J<br>K<br>L, M | 1000<br>1000<br>1000<br>1000<br>1000<br>500<br>500<br>500<br>100<br>100<br>100 | 1500<br>1500<br>1500<br>1000<br>1000<br>1000<br>1000<br>800<br>800<br>500<br>500 | 12"<br>12"<br>12"<br>12"<br>12"<br>12"<br>12"<br>12"<br>12"<br>12"<br>12" | C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>C-7301/7303<br>See Page 72 | 2500<br>2500<br>2500<br>2000<br>2000<br>1500<br>1500<br>1500<br>800<br>800<br>500 |                                                                                                  |

NOTE: (1) Each KEMET number in its section applies to all case sizes.

(2) Standard packaging refers to number of pieces per bag, box, tray or vial.

| TANTALUM PACKAGING (Continued) |                   |                           |              |                                 |                              |              |                              |               |
|--------------------------------|-------------------|---------------------------|--------------|---------------------------------|------------------------------|--------------|------------------------------|---------------|
| KEMET(1)<br>Number             | Military<br>Style | Military<br>Specification | Case<br>Size | Standard<br>Bulk(2)<br>Quantity | Standard<br>Reel<br>Quantity | Reel<br>Size | Standard<br>Reeling<br>Spec. | Ammo<br>Packs |
| T363                           | CX02              | MIL-C-49137/2             | A            | 1000                            | 1500                         | 12"          | C-7301/7303                  | 2500          |
|                                |                   |                           | B            | 1000                            | 1500                         | 12"          | C-7301/7303                  | 2000          |
|                                |                   |                           | C            | 500                             | 500                          | 12"          | C-7301/7303                  | 800           |
|                                |                   |                           | D            | 500                             | 500                          | 12"          | See Page 72                  | 800           |
| T368                           |                   |                           | C            | 500                             | 500                          | 12"          | C-7301/7303                  | 800           |
|                                |                   |                           | D            | 500                             | 500                          | 12"          | C-7301/7303                  | 800           |
| T369                           | CX12              | MIL-C-49137/2             | A            | 1000                            | 1500                         | 12"          | C-7301/7303                  | 2500          |
|                                |                   |                           | B            | 1000                            | 1500                         | 12"          | C-7301/7303                  | 2000          |
| T370                           |                   |                           | C            | 500                             | N/A                          | N/A          | N/A                          | N/A           |
|                                |                   |                           | D            | 500                             | 1000                         | 12"          | C-7301                       | N/A           |
|                                |                   |                           | E            | 500                             | 1000                         | 12"          | C-7301                       | N/A           |
|                                |                   |                           | F            | 250                             | N/A                          | N/A          | N/A                          | N/A           |
| T378                           | CX06              | MIL-C-49137/6             | D            | 200                             | 1000                         | 12"          | C-7301                       | N/A           |
|                                |                   |                           | E            | 180                             | 1000                         | 12"          | C-7301                       | N/A           |
|                                |                   |                           | F            | 50                              | N/A                          | N/A          | N/A                          | N/A           |
| T396,<br>T398                  |                   |                           | A-B          | 1000                            | 1500                         | 12"          | C-7301/7303                  | 2000          |
|                                |                   |                           | C            | 500                             | 1500                         | 12"          | C-7301/7303                  | 2000          |
|                                |                   |                           | D-F          | 500                             | 1000                         | 12"          | C-7301/7303                  | 1500          |
|                                |                   |                           | G            | 500                             | 1000                         | 12"          | C-7301/7303                  | 2000          |
|                                |                   |                           | H            | 500                             | 800                          | 12"          | C-7301/7303                  | 2000          |
|                                |                   |                           | J            | 250                             | 800                          | 12"          | C-7301/7303                  | 1600          |
|                                |                   |                           | K            | 250                             | 500                          | 12"          | C-7301/7303                  | 800           |
|                                |                   |                           | L-M          | 250                             | 500                          | 12"          | C-7301/7303                  | 500           |

NOTE: (1) Standard packaging refers to number of pieces per bag, box, tray or vial.

(2) Quantity varies. For further details, please consult the factory.

## INTRODUCTION

KEMET solid tantalum capacitors are identified by the initial "T," followed by a unique "Series" number; for example, T110, T322, T350, etc. Each Series denotes a general physical form and type of encapsulation, as well as limits on dimensions and certain electrical characteristics under standard conditions of 25°C, 50% relative humidity, and one atmosphere pressure. Specific requirements are set forth in the respective Product Series in this catalog. All Military products are 100% electrically screened for the parameters shown in the respective product section. For non-military product, all series are 100% screened for leakage, capacitance and dissipation factor. All Series are inspected to electrical limits using a minimum .1% AQL sampling plans, according to the Military Standard MIL-STD-105, even after 100% testing. This sampling plan, to the best of KEMET Electronics' knowledge, meets or exceeds the generally accepted industry standard for similar products. KEMET capacitors may also be supplied, with prior agreement, to meet specifications with requirements differing from those of KEMET catalogs. **Reference ESR values are provided but are NOT 100% screened**

These Notes apply generally to all KEMET solid tantalum capacitors and illustrate typical performance under normal application conditions, except where noted. Certain Series will respond differently to various environmental conditions. For example, hermetically sealed series are relatively immune to humidity effects, while plastic-encased series are not. The intent of these Notes is not to delineate such differences but to provide generalized information concerning performance characteristics.

## 1. GENERAL APPLICATION CLASS

Solid tantalum capacitors are usually applied in circuits where the AC component is small compared to the DC component. Typical uses known to KEMET Electronics include blocking, by-passing, decoupling, and filtering. They are also used in timing circuits. If two of these polar capacitors are connected "back-to-back" (i.e., negative-to-negative or positive-to-positive), the pair may be used in AC applications (as a non-polar device).

## 2. STORAGE CONDITIONS

Capacitors may be stored without applied voltage over the operating temperature range specified in the catalogs for each Series. The range is from -55 to +125° C for all Series.

Tantalum capacitors do not lose capacitance from the "de-forming" effect as do liquid-electrolytic capacitors. Storage at high temperature may cause a small, temporary increase in leakage current (measured under standard conditions), but the original value is usually restored within a few minutes after application of rated voltage.

Series which are not hermetically sealed exhibit reversible changes in parameters with respect to relative humidity (RH). Capacitance increases with increasing humidity. The limiting change, reached upon establishment of equilibrium with the environment, is approximately -5% to +12% over the range from 25% to 95% RH, referred to the standard 50% RH. The amount of change is dependent upon size (capacitance and voltage rating, ie: CV product); small sizes might change no more than ±5%. Equilibrium at such extremes is seldom attained by plastic-cased capacitors, and the change in capacitance is consequently less. The rate of response to humidity changes increases with increasing temperature. Dissipation factor also increases with increasing RH. The

limiting change, at equilibrium with 95% RH, is approximately 50%.

DC leakage current may rise upon exposure to a combination of high temperature and high humidity, but is normally restored by voltage conditioning under standard conditions. The increase will be greater than that experienced under temperature influence alone because of conduction through absorbed water.

Hermetically-sealed and non-hermetic Series may be affected by absorption of water on external insulating surfaces. The water film may also attract a layer of dust from the air, increasing the effect. The most sensitive parameter is leakage current.

## 3. POLARITY

These capacitors are inherently polar devices and may be permanently damaged or destroyed if connected with the wrong polarity. The positive terminal is identified on the capacitor body by a polarity mark and the capacitor body may include an obvious geometrical shape. However, some Series contain two capacitors connected (negative-to-negative) to form "non-polar" capacitors. Rated voltage (see para. 8) may be applied to these Series in either direction.

## 4. OPERATING ENVIRONMENT

Most of the discussion under "Storage Conditions" will apply also when capacitors are operated within the applicable electrical ratings described below. The temporary increase in leakage current (at standard conditions) following elevated-temperature exposure is not observed, however, if the capacitors are operated with adequate DC voltage applied.

## 5. CAPACITANCE

Capacitance is measured at 120 Hz and 25° C with up to 1 volt rms applied. Note that, in either operation, peak AC plus DC bias must not exceed either rated voltage (normally polarized) or 15% of rated voltage in the reverse direction at 25°C. Measurement circuits are of high impedance, however, and under these conditions 1 volt rms may be applied even to 6 volt capacitors (23% peak reversal) without a DC bias. DC bias is thus normally not used, except when rated voltage is below 6 volts and the AC signal level exceeds 0.3 vrms. However, MIL-C-39003 provides for up to 2.2 volts DC. DC bias is not commonly used at room temperature, but is more commonly used at elevated temperatures.

DC bias causes a small reduction in capacitance, up to about 2% when full rated voltage is applied as bias. DF is also reduced by the presence of DC; rated voltage may cause a decrease in DF of about 0.2% (e.g., a decrease from 3.6 to 3.4% DF).

Capacitance changes very little below 1 kHz but decreases more noticeably at higher frequencies. Larger capacitance values decline more rapidly than small ratings. The effect of frequency upon capacitance is shown in Figure 1.



Figure 1. Normal Effect of Frequency upon Capacitance

Capacitance typically changes with temperature according to the curve of Figure 2.



**Figure 2. Typical Effect of Temperature upon Capacitance**

## 6. DISSIPATION FACTOR (DF)

DF is measured at 120 Hz and 25° C with up to 1 volt rms applied. Note that, in either operation, peak AC plus DC bias must not exceed either rated voltage (normally polarized) or 15% of rated voltage in the reverse direction at 25°C. Measurement circuits are of high impedance, however, and under these conditions 1 volt rms may be applied even to 6 volt capacitors (23% peak reversal) without a DC bias. DC bias is thus normally not used, except when rated voltage is below 6 volts and the AC signal level exceeds 0.3 vrms. However, MIL-C-39003 provides for up to 2.2 volts DC. DC bias is not commonly used at room temperature, but is more commonly used at elevated temperatures.

Dissipation Factor (DF) is a useful low-frequency measure of the resistive component in capacitors. It is the ratio of the unavoidable resistance to the capacitive reactance, usually expressed in percent. DF increases with temperature above +25° C and may also increase at lower temperatures. Unfortunately, one general limit for DF cannot be specified for all capacitance/voltage combinations, nor can response to temperature be simply stated. Catalogs for the respective series list DF limits under various conditions.

Dissipation factor increases with increasing frequency as would be expected from the decreasing capacitive reactance. DF is not a very useful parameter above about 1 kHz. The DF of larger capacitance values increases more rapidly than that of smaller ratings. Figure 3 shows typical effect of frequency on DF.



**Figure 3. Normal Effect of Frequency upon Dissipation Factor**

DC bias causes a small reduction in capacitance, up to about 2% when full rated voltage is applied, as bias. DF is also reduced by the presence of DC bias. Rated voltage may cause a decrease in DF of about 0.2% (e.g., a decrease from 3.6 to 3.4% DF).

DF is defined as  $\frac{ESR}{X_c}$  and is also referred to occasionally, as  $\tan d$  or "loss tangent." The "Quality Factor," Q, is the reciprocal of DF (DF is not expressed in

percent in this calculation). Another expression, rarely used, is the "power factor," or  $\frac{ESR}{Z}$ . Power factor is  $\cos u$ , while DF is  $\tan u$ .

## 7. DC LEAKAGE (DCL)

DC leakage is affected by voltage to a much larger extent, and this effect can frequently be used to advantage in circuits where only very low leakage currents can be tolerated. Typical response of DCL to applied voltage is illustrated in Figure 4.



**Figure 4. Typical Range of DC Leakage as a Function of Applied Voltage**

DC leakage current (DCL) increases with increasing temperature according to the typical curve of Figure 5.



**Figure 5. Typical Effect of Temperature upon DC Leakage Current**

Leakage current is measured at a rated voltage through +85°C and may also be measured at +125°C with 2/3 of rated voltage applied.

## 8. RATED VOLTAGE

This term refers to the maximum continuous DC working voltage permissible at temperatures of +85° C or below. The lower operating temperature is specified as -55° C. Operation above +85° C is permissible, with reduced working voltage. Typical working voltage reduction is to 2/3 of rated voltage at +125° C.

## 9. WORKING VOLTAGE

This is the maximum recommended peak DC operating voltage for continuous duty at or below 85°C without DC voltage surges or AC ripple superimposed. No voltage derating is required below 85°C. Capacitors may be operated to 125°C with working voltage linearly derated to 2/3 of the 85°C rating at 125°C as shown in Figure 6.



Figure 6. Working Voltage Change with Temperature

## 10. SURGE VOLTAGE

Surge voltage is defined as the maximum voltage to which the capacitor should be subjected under transient conditions, including peak AC ripple and all DC transients.

|                           |     |   |     |   |    |       |    |    |    |    |    |    |     |     |
|---------------------------|-----|---|-----|---|----|-------|----|----|----|----|----|----|-----|-----|
| DC Working Voltage @ 85°C | 2   | 3 | 4   | 6 | 10 | 15/16 | 20 | 25 | 35 | 50 | 60 | 75 | 100 | 125 |
| Surge Voltage @ 85°C      | 2.6 | 4 | 5.3 | 8 | 13 | 20    | 26 | 33 | 46 | 65 | 78 | 98 | 130 | 140 |

TABLE 1 Surge Voltage Ratings

A typical surge voltage test is performed at +85°C with the applicable surge voltage per Table 1. The surge voltage is applied for 1000 cycles of 30 seconds on voltage through a 33 ohm series resistor and 30 seconds off voltage with the capacitor discharged through a 33 ohm resistor. Upon completing the test, the capacitors are allowed to stabilize at room temperature. Capacitance, DF, and DCL are then tested:

1. The DCL should not exceed the initial 25°C limit.
2. The capacitance should be within  $\pm 10\%$  of initial value.
3. The DF should not exceed the initial 25°C limit.

## 11. REVERSE VOLTAGE

Although these are polar capacitors, some degree of transient voltage reversal is permissible, as seen below. The capacitors should not be operated continuously in reverse mode, even within these limits.

| Temperature, °C. | Percentage of Rated Voltage |
|------------------|-----------------------------|
| +25              | 15                          |
| +85              | 5                           |
| +125             | 1                           |

TABLE 2 Reverse Voltage Ratings

## 12. EQUIVALENT SERIES RESISTANCE (ESR)

Equivalent Series Resistance (ESR) is the preferred high-frequency statement of the resistance unavoidably appearing in these capacitors. ESR is not a pure resistance, and it decreases with increasing frequency. Typical ESR limits are established in each specific product series. However, the ESR limits provided are for reference only, and are not necessarily the actual value that a particular Series product will attain.

Total impedance of the capacitor is the vector sum of capacitive reactance ( $X_C$ ) and ESR, below resonance; above resonance total impedance is the vector sum of inductive reactance ( $X_L$ ) and ESR.



Figure 7a Total Impedance of the Capacitor Below Resonance



Figure 7b Total Impedance of the Capacitor Above Resonance

To understand the many elements of a capacitor, see Figure 8.



Figure 8. The Real Capacitor

A capacitor is a complex impedance consisting of many series and parallel elements, each adding to the complexity of the measurement system.

$L$  — Represents lead wire and construction inductance. In most instances (especially in solid tantalum and

monolithic ceramic capacitors) it is insignificant at the basic measurement frequencies of 120 and 1000 Hz.

RS — Represents the actual ohmic series resistance in series with the capacitance. Lead wires and capacitor electrodes are contributing sources.

RL — Capacitor Leakage Resistance. Typically it can reach 50,000 megohms in a tantalum capacitor. It can exceed  $10^{12}$  ohms in monolithic ceramics and in film capacitors.

**Rd** — The dielectric loss contributed by dielectric absorption and molecular polarization. It becomes very significant in high frequency measurements and applications. Its value varies with frequency.

Cd — The inherent dielectric absorption of the solid tantalum capacitor which typically equates to 1-2% of the applied voltage.

As frequency increases,  $X_c$  continues to decrease according to its equation above. There is unavoidable inductance as well as resistance in all capacitors, and at some point in frequency, the reactance ceases to be capacitive and becomes inductive. This frequency is called the self-resonant point. In solid tantalum capacitors, the resonance is damped by the ESR, and a smooth, rather than abrupt, transition from capacitive to inductive reactance ( $X_L = 2\pi fL$ ) follows.



### Figure 9. ESR and Impedance vs. Frequency



**Figure 10. ESR and Impedance vs. Frequency**



**Figure 11a. ESR and Impedance vs. Frequency**

Typical ESR and Z performance is given for representative capacitor ratings in Figures 9 through 11. Measured impedance will be affected by the length of lead wire included. Data for the curves were taken by including 1/2" of each lead wire in the measuring circuit.

Despite the fact that the reactance is entirely inductive above the self-resonance, these capacitors find use as decoupling devices above 10 MHz. Special designs have been developed for minimum inductance and are used above 100 MHz.

ESR and Z are also affected by temperature. At 100 kHz, ESR decreases with increasing temperature. The amount of change is influenced by the size of the capacitor and is generally more pronounced on smaller ratings.



**Figure 11b Typical Effect of Temperature on 100 kHz ESR**

### 13. POWER DISSIPATION

Permissible power dissipation has been empirically established for all Series and is listed in each respective product section.

See pages 6-41 for herm seal, 42-50 for axial and radial molded, and 61-70 for tantalum dipped.

It is usually most convenient to translate the permissible power into an AC voltage rating. Assuming a sinusoidal waveform, the "ripple voltage" permissible may be calculated from the impedance and ESR data shown in the respective product section. However, three criteria must be observed:

1. Dissipated power must not exceed the limits specified for the Series.

2. The positive peak AC voltage plus the DC voltage must not exceed the maximum working voltage permitted at the ambient temperature.

3. The negative peak AC voltage, in combination with the DC voltage, must not exceed the permissible reverse voltage at the ambient temperature.

The rms ripple voltage limitation imposed by power dissipation is given by:

$$P = I^2 R = \frac{E^2 R}{Z^2}$$

where: I = rms ripple current (amperes)  
 E = rms ripple voltage (volts)  
 P = power (watts)  
 Z = impedance at specified frequency (ohms)  
 R = equivalent series resistance at specified frequency (ohms)

Maximum allowable rms ripple voltage may be determined as follows:

$$E(\text{max}) @ 25^\circ\text{C} = Z \sqrt{\frac{P(\text{max})}{R}}$$

$E(\text{max}) = 85^\circ\text{C} = 0.9 E(\text{max}) @ 25^\circ\text{C}$   
 $E(\text{max}) @ 125^\circ\text{C} = 0.4 E(\text{max}) @ 25^\circ\text{C}$   
 $P(\text{max}) =$  maximum watts shown on Performance Characteristic pages 5, 42, 49, 58 and 61.

Permissible AC ripple current can be determined by the following:

$$I_{\text{rms}} = \sqrt{\frac{P(\text{max})}{R}}$$

If two polar capacitors are connected back-to-back, (1) the pair may be operated on AC without need for DC bias. The first two criteria above must be observed. If DC is applied, the sum of DC and peak AC must not exceed, in either direction, the maximum working voltage specified for the ambient temperature.

(1) Some KEMET Series provide convenient assemblies of non-polar pairs. The two negative terminals are connected internally. It is also permissible to connect the two positive terminals to form a non-polar pair.

#### 14. LONG-TERM STABILITY

Within the general class of electrolytic capacitors, solid tantalum capacitors offer unusual stability of the three important parameters: capacitance, dissipation factor, and leakage current. These solid-state devices are not subject to the effects of electrolysis, deforming or drying-out associated with liquid-electrolyte capacitors.

When stabilized for measurement at standard conditions, capacitance will typically change less than  $\pm 3\%$  during a 10,000 hour life test  $+85^\circ\text{C}$ . The same comparative change has been observed in shelf tests at  $+25^\circ\text{C}$  extending for 50,000 hours. (Some of this change may stem from instrument or fixture error.)

Dissipation factor exhibits no typical trend. Data from 10,000 hour life tests at  $+85^\circ\text{C}$  show that initial limits (at standard conditions) are not exceeded at the conclusion of these tests.

Leakage current is more variable than capacitance or DF; in fact, leakage current typically exhibits a logarithmic dependence in several respects. MIL-C-39003/1 permits leakage current (measured at standard conditions) to rise

by a factor of four over 10,000 hour life tests. Typical behavior shows a lower rate of change, which may be negative or positive. Initial leakage currents are frequently so low (less than 0.1 nanoampere in the smallest CV capacitors, to about 10 microampere in the largest CV types) that changes of several orders of magnitude have no discernable effect on the usual circuit designs.

#### 15. FAILURE MODE

Capacitor failure may be induced by exceeding the rated conditions of forward DC voltage, reverse DC voltage, surge voltage, surge current, power dissipation, or temperature. As with any practical device, these capacitors also possess an inherent, although low, failure rate when operated within the rated condition.

The dominant failure mode is by short-circuit. Minor parametric drifts (see Section 14 "Long-Term Stability") are of no consequence in circuits suitable for solid tantalum capacitors. Catastrophic failure occurs as an avalanche in DC leakage current over a short (millisecond) time span. The failed capacitor, while called "short-circuited", may exhibit a DC resistance of 10 to 104 ohm.

If a failed capacitor is in an unprotected low-impedance circuit, continued flow of current through the capacitor may obviously produce severe overheating. This heat may melt the internal solder (all Series) and the sealing solder used in hermetic Series. The short-circuit failure may thereby be converted to an open-circuit failure. If the circuit does not open promptly, the over-heated capacitor may damage the circuit board or nearby components. Protection against such occurrence is obtained by current-limiting devices or fuses provided by the circuit design.

Fortunately, the inherent failure rate of KEMET solid tantalum capacitors is low, and this failure rate may be further improved by circuit design. Statistical failure rates are provided for those capacitors with characters other than "A" in the next-to-last position of the part number. Relating circuit conditions to failure rate is aided by the guides in the section following.

#### 16. RELIABILITY PREDICTION

Three important application conditions largely control failure rate: DC voltage, temperature, and circuit impedance. Estimates of the respective effects are provided by the nomograph in Figure 12 and Table 3 following. The nomograph related failure rate to voltage and temperature while the table relates failure rate to impedance. These estimates apply to steady-state DC conditions, and they assume usage within all other rated conditions.

Standard conditions, which produce a unity failure rate factor, are rated voltage,  $+85^\circ\text{C}$ , and 0.1 ohm-per-volt circuit impedance. While voltage and temperature are straightforward there is sometimes difficulty in determining impedance. What is required is the circuit impedance seen by the capacitor. If several capacitors are connected in parallel, the impedance seen by each is lowered by the source of energy stored in the other capacitors. Energy is similarly stored in series inductors.

Failure rate is conventionally expressed in units of percent per thousand hours. As a sample calculation, suppose a particular batch of capacitors has a failure rate of 0.5% Khr under standard conditions. What would be predicted failure rate at 0.7 times rated voltage,  $+60^\circ\text{C}$  and  $0.8\Omega/\text{V}$ ? The nomograph gives a factor of  $7 \times 10^{-4}$ , and the table gives a factor of 0.3. The failure rate estimate is then:

$$0.5 \times 7 \times 10^{-4} \times 0.3 = 1.05 \times 10^{-4}, \text{ or } 0.0001\% \text{ Khr}$$



**Figure 12. Reliability Nomograph**

| Circuit Impedance (ohms/volt) | Failure Rate Improvement (multiplying factors) |
|-------------------------------|------------------------------------------------|
| 0.1                           | 1.0                                            |
| 0.2                           | .8                                             |
| 0.4                           | .6                                             |
| 0.6                           | .4                                             |
| 0.8                           | .3                                             |
| 1.0                           | .2                                             |
| 2.0                           | .1                                             |
| 3 or greater                  | .07                                            |

**TABLE 3 Relationship of Failure Rate to Impedance**

Voltage "de-rating" is a common and useful approach to improved reliability. It can be pursued too far, however, when it leads to installation of higher voltage capacitors of much larger size. Inherent failure rate is roughly proportional to  $CV^{1.6}$ , where C is capacitance and V is rated voltage. The effect becomes particularly noticeable above 50-volt ratings. It is possible to lose more via higher inherent failure rate than is gained by voltage derating.

The relationships shown are more useful when the failure rate has been statistically determined for a given group of capacitors.

Failure rate is statistically determined for each production batch of KEMET High Reliability capacitors, as described in Specification GR500 Catalog F2956. As noted above, not all capacitance/voltage rate values are inherently equal in failure rate. GR500 capacitors are processed and subjected to 100% reliability testing as a homogeneous group of one capacitance/voltage value. Failure rate under standard conditions is available from 1 to 0.001% Khr, depending upon the capacitance/voltage value.

Several Series are qualified under U.S. military specification MIL-C-39003. Failure rates as low as 0.001%/Khr are available for all capacitance/voltage values in given groups under this test program. The specifications and

their accompanying Qualified Products Lists should be consulted for details.

For Series not covered by military specifications, and internal sampling program is operated by KEMET Quality Assurance. The confidence level chosen for reporting the data is 60%. However, the cost of sampling each batch produced is overwhelmingly prohibitive, and no claim is made concerning knowledge of failure rate for any particular lot shipped. It is demonstrated that average failure rate for all commercial Series is between .1 and 1%/Khr at standard conditions and 60% confidence after 2,000 hours' testing, +85°C, and rated voltage and  $\leq 1$  ohm total series resistance.

## 17. SURGE CURRENT

All conventional reliability testing is conducted under steady-state DC voltage. Experience indicates that AC ripple, within the limits prescribed, has little effect on failure rate. Heavy surge currents are possible in some applications, however. Circuit impedance may be very low (below the standard 0.1 ohm/volt) or there may be driving inductance to cause voltage "ringing." Surge current may appear during turn-on of equipment, for example.

Failure rate under current-surge conditions may not be predictable from conventional life test data. A surge current test is utilized to ensure against a high frequency of such failures, and a description is available free of charge. The test has been adopted for all capacitors under MIL-C-39003/06/09/10 and KEMET's GR500 specifications.

## 18. ENVIRONMENTAL CONSIDERATION

It is not possible to foresee all the conditions to which capacitors may be subjected. Following is a list of standard tests which every Series will survive. Data may be available (upon request) under more severe stresses for certain Series.

- **LIFE TEST 85°C OR 125°C, 2000 Hours:** When subjected to 2000 hours at 85°C at full rated DC voltage, or 125°C at 2/3 of 85°C voltage, the capacitor shall meet the following requirements when tested at 25°C:

The DCL shall be within 1.25 times the initial DCL limit.

Capacitance shall be within  $\pm 10\%$  of the initial measured value.

The DF shall not exceed the initial limit.

- **SHELF LIFE +85°, 2000 hours.** Post test of capacitor shall meet the following requirements when tested at 25°C:

The DCL shall be within 1.5 times the initial DCL limit.

Capacitance shall be within  $\pm 10\%$  of the initial measured value.

The DF shall not exceed 1.5 times the initial limit.

- **LEAD STRENGTH MIL-STD-202 Method 211:** Pull test will be performed as in MIL-STD-202, Method 211. The following details and exceptions shall apply.
  - a. Test condition letter—A
  - b. The body of the capacitor will be securely clamped during test.

- c. Applied force—3 pounds (1.4 kg).
  - d. Test Condition letter—C (M39003 Test Condition letter—D)
  - e. Applied Force—1 pound, 3 bends.
- **VIBRATION; HIGH FREQUENCY:** Per MIL-STD-202, Method 204, Condition D, 10 Hz to 2000 Hz.
    - a. Mounting—Capacitors shall be mounted on a fixture by the body. Leads shall be supported by rigidly supported terminals.
    - b. Electrical load conditions—During the test, the specified DC rated voltage shall be applied to the capacitors.
    - c. Test condition letter—D (20 G).
    - d. Duration and direction of motion—4 hours in each of two mutually perpendicular directions (total of 8 hours), one parallel and the other perpendicular to the axis.
    - e. Measurements during vibration—During the last cycle, an electrical measurement shall be made to determine intermittent operation or open- or short-circuiting. Observations shall also be made to determine intermittent contact or arcing or open- or short-circuiting. Detecting equipment shall be sufficiently sensitive to detect any interruption with a duration of 0.5 ms, or greater.
    - f. Examination after test—Capacitors shall be visually examined for evidence of mechanical damage.
  - **SHOCK TEST:** Per MIL-STD-202, Method 213. The following details shall apply:
    - a. Special mounting means—Capacitors shall be rigidly mounted on a mounting fixture by the body. When securing leads, care shall be taken to avoid pinching the heads.
    - b. Test-condition letter—I (100 G peak). 6 ms. (sawtooth)
    - c. Measurements and electrical loading during shock—During the test, observations shall be made to determine intermittent contact or arcing or open- or short-circuiting. Detecting equipment shall be sufficiently sensitive to detect any interruption with a duration of 0.5 ms. The DC rated voltage shall be applied to the capacitors during the test.
    - d. Examinations after test—Capacitors shall be visually examined for evidence of arcing, breakdown, and mechanical damage.
  - **HUMIDITY LIFE TEST:** Capacitors shall be capable of withstanding 1000 hours at 55°C with an ambient humidity of 90-95% RH with rated DC voltage applied. After the capacitors have stabilized for a period of 24 hours at 25°C, they shall meet the following limits:
    - DCL shall not exceed 5 times the initial limit.
    - Capacitance shall be within  $\pm 10\%$  of the initial value.
    - DF shall not exceed 2 times the initial limit.
  - **THERMAL SHOCK—MIL-STD-202, Method 107:** Capacitors shall be subjected to thermal shock in accordance with MIL-STD-202, Method 107, Test Condition A. M39003 Components tested to MIL-STD-202, Method 107, Condition B. Measurements before and after cycling are required. Conditioning prior to the first cycle will be 15 minutes at the following standard inspection conditions:
    - a. Relative Humidity—Less than 50%.
    - b. Ambient Temperature—25°C  $\pm 5^\circ\text{C}$ .
    - c. Final measurements are made after stabilization at room temperature.
  - **MOISTURE RESISTANCE—MIL-STD-202, Method 106:** Capacitors shall be tested in accordance with MIL-STD-202, Method 106 including the following details:
    - a. Mounting—The capacitors shall be mounted by normal mounting means
    - b. Initial Measurements
    - c. Polarizing and Load Voltage—Not applicable
    - d. Final measurements—After the final cycle and within 2 to 6 hours after removal of the capacitors from the humidity chamber, capacitance, dissipation factor, and DC leakage will be measured.

DCL should not exceed the initial 25°C limit.  
Capacitance should be within  $\pm 10\%$  of the initial measured value.  
DF should not exceed the initial 25°C limit.
  - **RESISTANCE TO SOLVENTS — MIL-STD-202, Method 215:**

Brushing required after test.  
DCL meets limit shown in respective Part Number Tables.  
Capacitance meets applicable tolerance.  
DF meets limits shown in respective Part Number Tables.  
No visible damage to case or marking.
  - **RESISTANCE TO SOLDERING HEAT — MIL-STD-202, Method 210, Test Condition.**

Letter B. (260° for 10 Sec.)

Leads shall be immersed to within  $\frac{1}{4}$  inch of the capacitor body. Capacitance, DF, and DCL should meet original limits shown in respective Part Number Tables.
  - **SOLDERABILITY — MIL-STD-202, Method 208;**

Number of terminations on each capacitor tested: 2.  
Depth of insertion in flux and solder to within .125" of capacitor body.
  - **FLAMMABILITY —** The encapsulant for Molded and Conformal Coated Product meets or exceeds the following requirements:
    - Underwriters Lab. UL 94V-0
    - Oxygen Index per ASTM-D-2863
    - 28% min.
  - **STABILITY AT LOW AND HIGH TEMPERATURE**

-55°C to 125°C: Capacitors will be capable of withstanding extreme temperature testing at a succession of continuous steps at +25°C, -55°C, +25°C, +85°C, +125°C, +25°C, in the order stated. Capacitors shall be brought to thermal stability at each test

temperature. Capacitance, DF, and DCL are measured at each test temperature except that DCL is not measured at -55°C. DC bias of 2.0  $\pm$ 0.5 vdc is recommended for the capacitance and DF measurements.

When measurements are made at the various steps, the electrical limits for each temperature shall not exceed the following limits.

- Step 1, +25°C, DCL as indicated in original limit; capacitance within tolerance specified; DF as indicated in original limit shown in Part Number Tables.
- Step 2, -55°C, Capacitance within  $\pm$ 10% of initial value; ESR, DF within limit shown in Part Number Tables.
- Step 3, +25°C, DCL as indicated in original limit; capacitance within  $\pm$ 5% of initial value; ESR, DF within limit shown in Part Number Tables.
- Step 4, +85°C, DCL shall not exceed 10 times original DCL limit at 25°C. Capacitance shall be within  $\pm$ 10% of the initial value. DF shall be within 125% of limits shown in Part Number Tables. ESR shall be within limits shown in Part Number Tables.
- Step 5, +125°C, DCL shall not exceed 12.5 times the original limit at 25°C. Capacitance shall be within  $\pm$ 12% of initial value. DF shall be within 150% of limits shown in Part Number Tables. ESR shall be within limits shown in Part Number Tables.
- Step 6, +25°C, DCL as indicated in original limit; capacitance within  $\pm$ 5% of initial value; ESR, DF as indicated in original limit shown in Part Number Tables.

Note: M39003 specifies  $\Delta$ 's and limits by individual slash sheet.

- DAMP HEAT, STEADY STATE: Meets requirements of IEC Publication 384-15, method IEC 68-2-3. Climatic category 55/125/56.

## 19. MOUNTING

All encapsulated Series fall into two general classes. The first is provided with leads extending from opposite ends of the body, generally along the principle axis of the body ("axial leads"). The second is provided with parallel leads extending from one side or face of the body ("radial leads"). With either type, mounting points are normally provided by the leads themselves.

Axial leads may be used for point-to-point wiring, but usually, the wires are bent at 90° from the capacitor axis for insertion through printed circuit (PC) boards. Axial capacitors supplied on reels for machine insertion will

withstand the mechanical stresses of bending and inserting by all popular machines known to KEMET at this time. Most KEMET axial Series may be supplied on reels to feed such machines. Radial leads are intended to plug directly into holes of PC boards. Auto-machines will insert compatible radial capacitor designs, and most KEMET capacitors may be supplied in appropriate reeled forms (ARIS).

With either axial or radial types, attention should be paid to treatment of the capacitors during mounting and afterward under service conditions. Difficulty during mounting usually arises from lead damage or from overheating. Hand soldering technique or, more often, wave-solder machines cause the overheating. The internal cathode connection on most Series is made between solder and a silver-pigmented paint. If too much heat is applied, this solder may remelt and degrade the silver-solder interface or cause a direct short-circuit.

KEMET's hermetically-sealed series has an internal space into which molten cathode solder may run, depriving the cathode connection and possibly flowing across the terminals to short-circuit the capacitor from the inside. It is also possible to remelt the solder which bonds the rim of the glass-metal seal, causing loss of hermeticity and possibly a short-circuit. Finally, solder at the exit point of the positive wire may be remelted with similar effect. This solder is a high-temperature alloy, however, and it is much less likely to be melted. (Re-dipping of lead wires is practiced by some users, introducing another hazard of remelting this solder).

Plastic-encased Series have only one site of solder, the internal cathode connection. The rate of heat transfer through the plastic is lower than through the metal can of hermetic Series, but conduction along the negative lead-wire to remelt this solder is very similar. There is little internal void within plastic cases, so remelted solder tends to remain in its original location and solidify when heat is removed. Short-circuiting is very unlikely, but reliability of the internal connection may be compromised by leaching of silver from the paint into the molten solder. The latter effect degrades the cathode connection in hermetic parts as well.

All encased capacitors will pass the Resistance to Soldering Heat Test of MIL-STD-202, Method 210, Condition B. This test dips each leadwire into molten solder at +260° C for 10 seconds while the capacitor body is held vertically above the solder. KEMET capacitors will pass this test when the depth of immersion brings the capacitor body (or closest external solder joint, if it is closer as in some hermetic Series) to a minimum distance of 0.100 inches from the solder surface. This demonstration of resistance to solder heat is in accordance with what is believed to be the industry standard. More severe treatment must be considered reflective of an improper soldering process.

Shown in Figure 13 is a recommended solder wave profile for both axial and radial leaded solid tantalum capacitors.

## Optimum Solder Wave Profile



Figure 13.

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**NOTICE: Place 011 in front of the above Phone and Fax numbers for Europe and Asia, when dialing from a United States exchange.**  
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