

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon



Chip Type, Low Impedance  
series



- Chip type, low impedance temperature range up to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

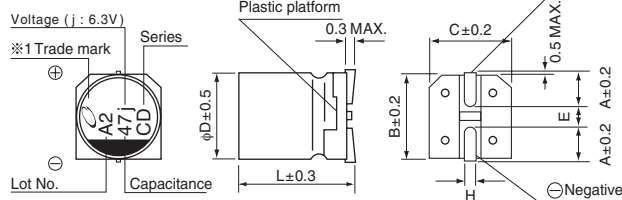


## Specifications

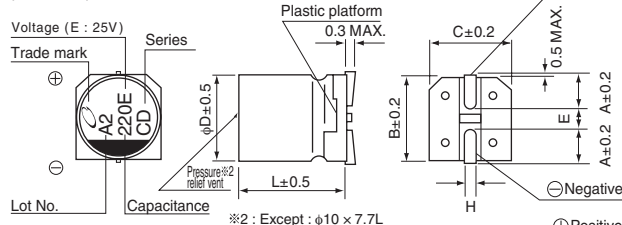
| Item                          | Performance Characteristics                                                                                                                                                                                                             |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|--------------------|------|----------------------------------------------------------------------------------------------------------------|------|------|------|------|---|
| Category Temperature Range    | - 55 to +105°C                                                                                                                                                                                                                          |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Rated Voltage Range           | 6.3 to 100V                                                                                                                                                                                                                             |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Rated Capacitance Range       | 1 to 3300F                                                                                                                                                                                                                              |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                     |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Leakage Current               | After 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (μA), whichever is greater.                                                                                                                |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Tangent of loss angle (tan δ) | Measurement frequency : 120Hz at 20°C                                                                                                                                                                                                   |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
|                               | Rated voltage (V)                                                                                                                                                                                                                       | 6.3             | 10   | 16                 | 25   | 35                                                                                                             | 50   | 63   | 80   | 100  |   |
|                               | tan δ (MAX.)                                                                                                                                                                                                                            | 0.26            | 0.19 | 0.16               | 0.14 | 0.12                                                                                                           | 0.10 | 0.08 | 0.08 | 0.07 |   |
|                               | For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.                                                                                                                                                             |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Stability at Low Temperature  | Measurement frequency : 120Hz                                                                                                                                                                                                           |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
|                               | Rated voltage (V)                                                                                                                                                                                                                       | 6.3             | 10   | 16                 | 25   | 35                                                                                                             | 50   | 63   | 80   | 100  |   |
|                               | Impeance ratio<br>ZT / Z20 (MAX.)                                                                                                                                                                                                       | Z—25°C / Z+20°C | 2    | 2                  | 2    | 2                                                                                                              | 2    | 2    | 2    | 2    | 2 |
|                               |                                                                                                                                                                                                                                         | Z—40°C / Z+20°C | 3    | 3                  | 3    | 3                                                                                                              | 3    | 3    | 3    | 3    | 3 |
|                               |                                                                                                                                                                                                                                         | Z—55°C / Z+20°C | 4    | 4                  | 4    | 3                                                                                                              | 3    | 3    | 3    | 3    | 3 |
| Endurance                     | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 5000 hours (2000 hours for L < 10 mm: 50V or less, and for L ≤ 10mm: 63V or more) at 105°C.             |                 |      | Capacitance Change |      | Within ± 30% of the initial capacitance value                                                                  |      |      |      |      |   |
|                               |                                                                                                                                                                                                                                         |                 |      | tan δ              |      | 200% or less than the initial specified value<br>300% or less than the initial specified value for 63V or more |      |      |      |      |   |
|                               |                                                                                                                                                                                                                                         |                 |      | Leakage current    |      | Less than or equal to the initial specified value                                                              |      |      |      |      |   |
| Shelf Life                    | After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above. |                 |      |                    |      |                                                                                                                |      |      |      |      |   |
| Resistance to soldering heat  | The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C. The capacitors shall meet the characteristic requirements listed at right when they are removed from the plate and restored to 20°C.               |                 |      | Capacitance Change |      | Within ± 10% of the initial capacitance value                                                                  |      |      |      |      |   |
|                               |                                                                                                                                                                                                                                         |                 |      | tan δ              |      | Less than or equal to the initial specified value                                                              |      |      |      |      |   |
|                               |                                                                                                                                                                                                                                         |                 |      | Leakage current    |      | Less than or equal to the initial specified value                                                              |      |      |      |      |   |
| Marking                       | Black print on the case top.                                                                                                                                                                                                            |                 |      |                    |      |                                                                                                                |      |      |      |      |   |

## Chip Type

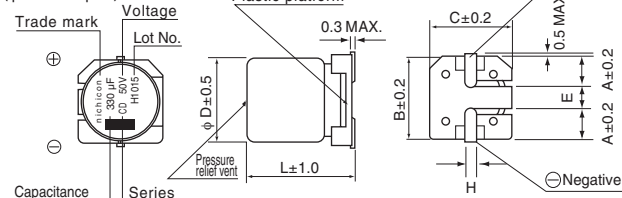
(φ4 to φ8 × φ6.2)



(φ8 × 10, φ10)



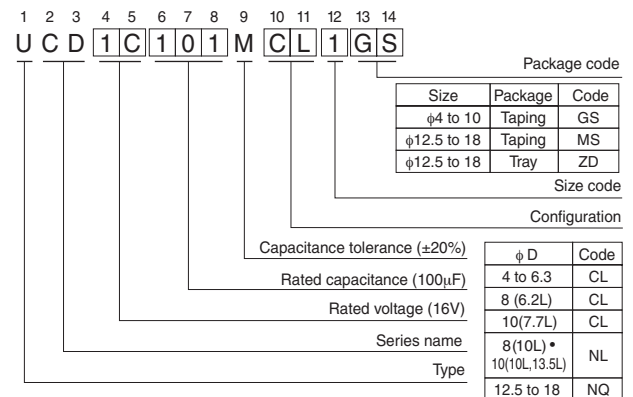
(φ12.5 to φ18)



※φ8 × 10L, φ10 × 10L, φ12.5 × 13.5L, φ16 × 16.5L, φ18 × 16.5L :  
The vibration structure-resistant product is also available upon request, please ask for details.

• Dimension table in next page.

## Type numbering system (Example : 16V 100μF)



| φD × L | 4 × 5.8    | 5 × 5.8    | 6.3 × 5.8  | 6.3 × 7.7  | 8 × 6.2    | 8 × 10     | 10 × 7.7   | 10 × 10    | (mm) |
|--------|------------|------------|------------|------------|------------|------------|------------|------------|------|
| A      | 1.8        | 2.1        | 2.4        | 2.4        | 3.3        | 2.9        | 3.2        | 3.2        |      |
| B      | 4.3        | 5.3        | 6.6        | 6.6        | 8.3        | 8.3        | 10.3       | 10.3       |      |
| C      | 4.3        | 5.3        | 6.6        | 6.6        | 8.3        | 8.3        | 10.3       | 10.3       |      |
| E      | 1.0        | 1.3        | 2.2        | 2.2        | 2.3        | 3.1        | 4.5        | 4.5        |      |
| L      | 5.8        | 5.8        | 5.8        | 7.7        | 6.2        | 10         | 7.7        | 10         |      |
| H      | 0.5 to 0.8 | 0.5 to 0.8 | 0.5 to 0.8 | 0.5 to 0.8 | 0.5 to 0.8 | 0.8 to 1.1 | 0.8 to 1.1 | 0.8 to 1.1 |      |

| φD × L | 10 × 13.5  | 12.5 × 13.5 | 16 × 16.5  | 18 × 16.5  |
|--------|------------|-------------|------------|------------|
| A      | 3.2        | 4.8         | 5.4        | 6.4        |
| B      | 10.3       | 13.6        | 17.1       | 19.1       |
| C      | 10.3       | 13.6        | 17.1       | 19.1       |
| E      | 4.5        | 4.0         | 6.3        | 6.3        |
| L      | 13.5       | 13.5        | 16.5       | 16.5       |
| H      | 0.8 to 1.1 | 1.0 to 1.4  | 1.0 to 1.4 | 1.0 to 1.4 |

## Voltage

|      |     |    |    |    |    |    |    |    |     |
|------|-----|----|----|----|----|----|----|----|-----|
| V    | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 |
| Code | j   | A  | C  | E  | V  | H  | J  | K  | 2A  |

CAT.8100D

## ■ Dimensions

| Cap. (μF) | V<br>Code | 6.3         |      |      | 10          |      |      | 16          |      |      | 25          |       |      | 35          |       |      | 50                          |       |      |
|-----------|-----------|-------------|------|------|-------------|------|------|-------------|------|------|-------------|-------|------|-------------|-------|------|-----------------------------|-------|------|
|           |           | 0J          |      |      | 1A          |      |      | 1C          |      |      | 1E          |       |      | 1V          |       |      | 1H                          |       |      |
| 1         | 010       |             |      |      |             |      |      |             |      |      |             |       |      |             |       |      | 4 × 5.8                     | 2.70  | 60   |
| 2.2       | 2R2       |             |      |      |             |      |      |             |      |      |             |       |      |             |       |      | 4 × 5.8                     | 2.70  | 60   |
| 3.3       | 3R3       |             |      |      |             |      |      |             |      |      |             |       |      |             |       |      | 4 × 5.8                     | 2.70  | 60   |
| 4.7       | 4R7       |             |      |      |             |      |      |             |      |      |             |       |      | 4 × 5.8     | 1.35  | 90   | 4 × 5.8                     | 2.70  | 60   |
| 10        | 100       |             |      |      |             |      |      | 4 × 5.8     | 1.35 | 90   | 4 × 5.8     | 1.35  | 90   | ● 4 × 5.8   | 1.35  | 90   | ● 5 × 5.8                   | 1.50  | 90   |
|           |           |             |      |      |             |      |      |             |      |      |             |       |      | 5 × 5.8     | 0.70  | 160  | 6.3 × 5.8                   | 0.86  | 170  |
| 15        | 150       |             |      |      |             |      |      | 4 × 5.8     | 1.35 | 90   | 5 × 5.8     | 0.70  | 160  |             |       |      |                             |       |      |
| 22        | 220       | 4 × 5.8     | 1.35 | 90   | 4 × 5.8     | 1.35 | 90   | ● 4 × 5.8   | 1.35 | 90   | 5 × 5.8     | 0.70  | 160  | 5 × 5.8     | 0.70  | 160  | 6.3 × 5.8                   | 0.86  | 170  |
|           |           |             |      |      |             |      |      | 5 × 5.8     | 0.70 | 160  |             |       |      |             |       |      |                             |       |      |
| 27        | 270       | 4 × 5.8     | 1.35 | 90   | 5 × 5.8     | 0.70 | 160  | 5 × 5.8     | 0.70 | 160  | 6.3 × 5.8   | 0.36  | 240  |             |       |      |                             |       |      |
| 33        | 330       | 5 × 5.8     | 0.70 | 160  | ● 4 × 5.8   | 1.35 | 90   | 6.3 × 5.8   | 0.36 | 240  | ● 5 × 5.8   | 0.70  | 160  | 6.3 × 5.8   | 0.36  | 240  | 6.3 × 7.7                   | 0.66  | 195  |
|           |           |             |      |      | 5 × 5.8     | 0.70 | 160  |             |      |      | 6.3 × 5.8   | 0.36  | 240  |             |       |      | ● 8 × 6.2                   | 0.63  | 200  |
| 47        | 470       | ● 4 × 5.8   | 1.35 | 90   | 6.3 × 5.8   | 0.36 | 240  | ● 5 × 5.8   | 0.70 | 160  | 6.3 × 5.8   | 0.36  | 240  | 6.3 × 5.8   | 0.36  | 240  | 6.3 × 7.7                   | 0.66  | 195  |
|           |           | 5 × 5.8     | 0.70 | 160  |             |      |      | 6.3 × 5.8   | 0.36 | 240  |             |       |      |             |       |      | ● 8 × 6.2                   | 0.63  | 200  |
| 56        | 560       | 5 × 5.8     | 0.70 | 160  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36  | 240  |             |       |      |                             |       |      |
| 68        | 680       | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36  | 240  | 6.3 × 7.7   | 0.32  | 290  |                             |       |      |
| 100       | 101       | ● 5 × 5.8   | 0.70 | 160  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 7.7   | 0.32  | 290  | ● 6.3 × 7.7 | 0.32  | 290  | 8 × 10                      | 0.32  | 350  |
|           |           | 6.3 × 5.8   | 0.36 | 240  |             |      |      |             |      |      | ● 8 × 6.2   | 0.26  | 300  | 8 × 10      | 0.16  | 600  | ● 10 × 7.7                  | 0.36  | 330  |
| 150       | 151       | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 7.7   | 0.32 | 290  | 8 × 10      | 0.16  | 600  | 8 × 10      | 0.16  | 600  | 10 × 10                     | 0.16  | 700  |
|           |           |             |      |      |             |      |      | ● 10 × 7.7  | 0.18 | 600  | ● 10 × 7.7  | 0.18  | 600  | ● 10 × 7.7  | 0.18  | 600  |                             |       |      |
| 220       | 221       | 6.3 × 5.8   | 0.36 | 240  | 6.3 × 7.7   | 0.32 | 290  | 6.3 × 7.7   | 0.32 | 290  | 8 × 10      | 0.16  | 600  | 8 × 10      | 0.16  | 600  | 10 × 10                     | 0.16  | 700  |
|           |           |             |      |      | ● 8 × 6.2   | 0.26 | 300  | ● 8 × 6.2   | 0.26 | 300  | ● 10 × 7.7  | 0.18  | 600  | ● 10 × 7.7  | 0.18  | 600  |                             |       |      |
| 330       | 331       | 6.3 × 7.7   | 0.32 | 290  | 8 × 10      | 0.16 | 600  | 8 × 10      | 0.16 | 600  | 8 × 10      | 0.16  | 600  | 10 × 10     | 0.08  | 850  | ● 10 × 13.5                 | 0.14  | 800  |
|           |           | ● 8 × 6.2   | 0.26 | 300  | ● 10 × 7.7  | 0.18 | 600  | ● 10 × 7.7  | 0.18 | 600  |             |       |      |             |       |      | 12.5 × 13.5                 | 0.12  | 900  |
| 390       | 391       |             |      |      |             |      |      |             |      |      |             |       |      |             |       |      | 12.5 × 13.5                 | 0.12  | 900  |
| 470       | 471       | 8 × 10      | 0.16 | 600  | 8 × 10      | 0.16 | 600  | 8 × 10      | 0.16 | 600  | 10 × 10     | 0.08  | 850  | ● 10 × 13.5 | 0.08  | 950  | 16 × 16.5                   | 0.073 | 1610 |
|           |           | ● 10 × 7.7  | 0.18 | 600  | ● 10 × 7.7  | 0.18 | 600  | ● 10 × 7.7  | 0.18 | 600  |             |       |      | 12.5 × 13.5 | 0.08  | 1100 |                             |       |      |
| 680       | 681       | 8 × 10      | 0.16 | 600  | 10 × 10     | 0.08 | 850  | 10 × 10     | 0.08 | 850  | 10 × 13.5   | 0.08  | 950  | 12.5 × 13.5 | 0.08  | 1100 | 16 × 16.5                   | 0.073 | 1610 |
|           |           | ● 10 × 7.7  | 0.18 | 600  |             |      |      |             |      |      |             |       |      |             |       |      |                             |       |      |
| 1000      | 102       | 8 × 10      | 0.16 | 600  | 10 × 10     | 0.08 | 850  | 10 × 13.5   | 0.08 | 950  | 12.5 × 13.5 | 0.08  | 1100 | 16 × 16.5   | 0.035 | 1800 |                             |       |      |
| 1500      | 152       | 10 × 10     | 0.08 | 850  | 10 × 13.5   | 0.08 | 950  | 12.5 × 13.5 | 0.08 | 1100 |             |       |      |             |       |      |                             |       |      |
| 2200      | 222       | 10 × 13.5   | 0.08 | 950  | 12.5 × 13.5 | 0.08 | 1100 |             |      |      | 16 × 16.5   | 0.035 | 1800 |             |       |      | Case size<br>φD × L<br>(mm) |       |      |
| 3300      | 332       | 12.5 × 13.5 | 0.08 | 1100 |             |      |      |             |      |      |             |       |      |             |       |      |                             |       |      |

| Cap. (μF) | V<br>Code | 63          |       |      | 80          |      |     | 100                         |      |     |
|-----------|-----------|-------------|-------|------|-------------|------|-----|-----------------------------|------|-----|
|           |           | 1J          |       |      | 1K          |      |     | 2A                          |      |     |
| 3.3       | 3R3       |             |       |      | 5 × 5.8     | 5.00 | 25  |                             |      |     |
| 4.7       | 4R7       | 5 × 5.8     | 3.00  | 50   | 6.3 × 5.8   | 3.00 | 40  |                             |      |     |
| 10        | 100       | 6.3 × 5.8   | 1.50  | 80   | 6.3 × 7.7   | 2.40 | 60  |                             |      |     |
|           |           |             |       |      | ● 8 × 6.2   | 2.40 | 60  |                             |      |     |
| 22        | 220       | 6.3 × 7.7   | 1.20  | 120  | 8 × 10      | 1.30 | 130 | 8 × 10                      | 1.30 | 130 |
|           |           | ● 8 × 6.2   | 1.20  | 120  |             |      |     |                             |      |     |
| 33        | 330       | 8 × 10      | 0.65  | 250  | 8 × 10      | 1.30 | 130 | 10 × 10                     | 0.70 | 200 |
| 47        | 470       | 8 × 10      | 0.65  | 250  | 10 × 10     | 0.70 | 200 | 12.5 × 13.5                 | 0.32 | 500 |
| 68        | 680       | 10 × 10     | 0.35  | 400  | 12.5 × 13.5 | 0.32 | 500 | 12.5 × 13.5                 | 0.32 | 500 |
| 100       | 101       | 10 × 10     | 0.35  | 400  | 12.5 × 13.5 | 0.32 | 500 | 16 × 16.5                   | 0.17 | 793 |
| 150       | 151       | 12.5 × 13.5 | 0.16  | 800  | 12.5 × 13.5 | 0.32 | 500 | 16 × 16.5                   | 0.17 | 793 |
| 220       | 221       | 12.5 × 13.5 | 0.16  | 800  |             |      |     | 18 × 16.5                   | 0.15 | 917 |
| 330       | 331       |             |       |      | 16 × 16.5   | 0.17 | 793 | 18 × 16.5                   | 0.15 | 917 |
| 470       | 471       | 16 × 16.5   | 0.082 | 1410 | 18 × 16.5   | 0.15 | 917 | Case size<br>φD × L<br>(mm) |      |     |
| 680       | 681       | 18 × 16.5   | 0.08  | 1690 |             |      |     |                             |      |     |

Max. Impedance (Ω) at 20°C 100kHz, Rated ripple current (mA rms) at 105°C 100kHz

● : In this case, [6] will be put at 12th digit of type numbering system.

## ● Frequency coefficient of rated ripple current

| Frequency   | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
|-------------|------|-------|-------|------|---------------|
| Coefficient | 0.35 | 0.50  | 0.64  | 0.83 | 1.00          |

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.