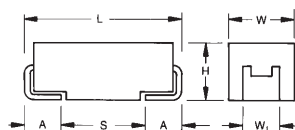


TMJ Tantalum SMD S1gma™ Series Capacitors

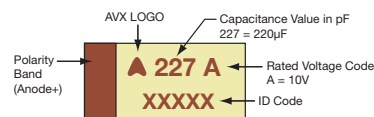


TMJ CONSTRUCTION



MARKING

A, B, C, D, E, U CASE



HOW TO ORDER

TMJ	D	227	K	006	#	C	^	A
Type	Case Size See table above	Capacitance Code pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	Tolerance K = ±10%	Rated DC Voltage 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	Packaging R = Pure Tin 7" Reel H = Tin Lead 7" Reel (Contact Manufacturer) Non RoHS	ESR Range C = Standard L = Low ESR	Suffix QX = S1gma™ Prime QY = S1gma™ Premium xx = S1gma™ Pro Custom	DCL A = 0.001CV C = 0.005CV

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C							
Capacitance Range:	0.22 µF to 680 µF							
Capacitance Tolerance:	±10%							
Leakage Current DCL:	(A) 0.001CV, (C) 0.005CV							
Rated Voltage (V _R)	≤ +85°C:	6.3	10	16	20	25	35	50
Category Voltage (V _C)	≤ +125°C:	4	7	10	13	17	23	33
Surge Voltage (V _S)	≤ +85°C:	8	13	20	26	32	46	65
Surge Voltage (V _S)	≤ +125°C:	5	8	13	16	20	28	40
Temperature Range:	-55°C to +125°C							
Reliability:	0.5% per 1000 hours at 85°C, VR with 0.1Ω/V series impedance, 60% confidence level AEC-Q200 per request							

The AVX S1gma™ series is offering a next generation of statistical screening and process control enhancement of tantalum capacitors for professional applications with improved reliability and extremely low DCL needs.

FEATURES

- -55 to +125°C operation temperature
- Basic reliability better than 0.5%/1000 hours
- (2x improvement over commercial series)
- improved DCL limits 0.001CV* and 0.005CV

S1gma™ Prime – Utilises 3 S1gma™ electrical screening to remove possible maverick parts from the distribution.

S1gma™ Premium – S1gma™ Prime, with addition of capability statistical screening utilising the AVX patented Q-Process to effectively remove components that may experience excessive parametric shifts or instability in operational life.

S1gma™ Pro Custom – A custom option where specific parameter limits and screening methods can be agreed based on 3 S1gma™ and Q-Process statistical screening based on capability techniques.

*selected codes, 0.001CV limit is available with S1gma™ Premium and Pro Custom options only

APPLICATIONS

- Wireless battery operated sensors
- TPM
- Automotive
- Avionics
- Safety systems
- Energy harvesting

For additional information on Q-process please consult the AVX technical publication "Reaching the Highest Reliability for Tantalum Capacitors" (see the link: <http://www.avx.com/docs/techinfo/Qprocess.pdf>)

CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W±0.20 (0.008) -0.10 (0.004)	H±0.20 (0.008) -0.10 (0.004)	W ₁ ±0.20 (0.008)	A±0.30 (0.012) -0.20 (0.008)	S Min.
A	1206	3216-18	3.20 (0.126)	1.60 (0.063)	1.60 (0.063)	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
B	1210	3528-21	3.50 (0.138)	2.80 (0.110)	1.90 (0.075)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
C	2312	6032-28	6.00 (0.236)	3.20 (0.126)	2.60 (0.102)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
D	2917	7343-31	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
E	2917	7343-43	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
U	2924	7361-43	7.30 (0.287)	6.10 (0.240)	4.10 (0.162)	3.10 (0.120)	1.30 (0.051)	4.40 (0.173)

W1 dimension applies to the termination width for A dimensional area only.

TMJ Tantalum SMD S1gma™ Series Capacitors



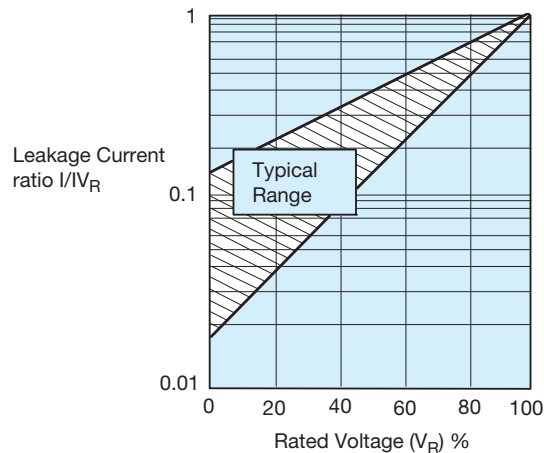
CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated voltage (V _R) to 85°C (Voltage Code)						
μF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.22	224							A
0.33	334						A	A
0.47	474						A	B
0.68	684						A	B
1.0	105					A	B	C
1.5	155				A	A	B	C
2.2	225			A	A	B	B	C
3.3	335			A	A	B	B	C
4.7	475		A	A	B	B	C	D
6.8	685		A	B	B	C	C	D
10	106	A	A	B	C	C	C	E
15	156	A	B	B	C	C	D	U
22	226	B	B	C	C	D	D	U
33	336	B	C	C	D	D	E	
47	476	C	C	D	D	D	U	
68	686	C	C	D	E	U		
100	107	C	D	E	E	U		
150	157	D	D	E	U			
220	227	D	E	U				
330	337	E	E					
470	477	E	U					
680	687	U						

Available Ratings

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

LEAKAGE CURRENT vs. RATED VOLTAGE



TMJ Tantalum SMD S1gma™ Series Capacitors



RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (μA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	MSL	100kHz RMS Current (mA)			
											25°C	85°C	125°C	
6.3 Volt @ 85°C														
TMJA106K006#CQYA	A	10	6.3	85	4	125	0.1	6	1500	3	224	201	89	
TMJA106K006#C^C	A	10	6.3	85	4	125	0.3	6	1500	3	224	201	89	
TMJA156K006#CQYA	A	15	6.3	85	4	125	0.1	6	1500	3	224	201	89	
TMJA156K006#C^C	A	15	6.3	85	4	125	0.45	6	1500	3	224	201	89	
TMJB226K006#C^C	B	22	6.3	85	4	125	0.66	6	600	3	376	339	151	
TMJB336K006#C^C	B	33	6.3	85	4	125	0.99	6	600	3	376	339	151	
TMJC476K006#CQYA	C	47	6.3	85	4	125	0.28	6	300	3	606	545	242	
TMJC476K006#C^C	C	47	6.3	85	4	125	1.41	6	300	3	606	545	242	
TMJC686K006#CQYA	C	68	6.3	85	4	125	0.41	6	300	3	606	545	242	
TMJC686K006#C^C	C	68	6.3	85	4	125	2.04	6	300	3	606	545	242	
TMJC107K006#CQYA	C	100	6.3	85	4	125	0.60	6	300	3	606	545	242	
TMJC107K006#C^C	C	100	6.3	85	4	125	3	6	300	3	606	545	242	
TMJD157K006#CQYA	D	150	6.3	85	4	125	0.90	6	200	3	866	779	346	
TMJD157K006#C^C	D	150	6.3	85	4	125	4.5	6	200	3	866	779	346	
TMJD227K006#CQYA	D	220	6.3	85	4	125	1.32	8	200	3	866	779	346	
TMJD227K006#C^C	D	220	6.3	85	4	125	6.6	8	200	3	866	779	346	
TMJE337K006#C^C	E	330	6.3	85	4	125	9.9	8	200	3	908	817	363	
TMJE477K006#CQYA	E	470	6.3	85	4	125	2.82	8	200	3	908	817	363	
TMJE477K006#C^C	E	470	6.3	85	4	125	14.1	8	200	3	908	817	363	
TMJU687K006#C^C	U	680	6.3	85	4	125	20.4	12	250	3	812	731	325	
10 Volt @ 85°C														
TMJA475K010#CQXC	A	4.7	10	85	7	125	0.24	6	2000	3	194	174	77	
TMJA685K010#CQYA	A	6.8	10	85	7	125	0.1	6	2000	3	194	174	77	
TMJA685K010#C^C	A	6.8	10	85	7	125	0.34	6	2000	3	194	174	77	
TMJA106K010#CQYA	A	10	10	85	7	125	0.10	6	2000	3	194	174	77	
TMJA106K010#C^C	A	10	10	85	7	125	0.5	6	2000	3	194	174	77	
TMJB156K010#C^C	B	15	10	85	7	125	0.75	6	700	3	348	314	139	
TMJB226K010#C^C	B	22	10	85	7	125	1.1	6	700	3	348	314	139	
TMJC336K010#C^C	C	33	10	85	7	125	1.65	6	300	3	606	545	242	
TMJC476K010#C^C	C	47	10	85	7	125	2.35	6	300	3	606	545	242	
TMJC686K010#C^C	C	68	10	85	7	125	3.4	6	300	3	606	545	242	
TMJD107K010#C^C	D	100	10	85	7	125	5.00	6	150	3	1000	900	400	
TMJD157K010#C^C	D	150	10	85	7	125	7.50	8	150	3	1000	900	400	
TMJE227K010#C^C	E	220	10	85	7	125	11	8	150	3	1049	944	420	
TMJE337K010#CQYA	E	330	10	85	7	125	3.3	8	150	3	1049	944	420	
TMJE337K010#C^C	E	330	10	85	7	125	16.5	8	150	3	1049	944	420	
TMJU477K010#C^C	U	470	10	85	7	125	23.5	12	200	3	908	817	363	
16 Volt @ 85°C														
TMJA225K016#CQXC	A	2.2	16	85	10	125	0.18	6	3500	3	146	132	59	
TMJA335K016#CQXC	A	3.3	16	85	10	125	0.26	6	3500	3	146	132	59	
TMJA475K016#C^C	A	4.7	16	85	10	125	0.38	6	3500	3	146	132	59	
TMJB685K016#C^C	B	6.8	16	85	10	125	0.54	6	1200	3	266	240	106	
TMJB106K016#C^C	B	10	16	85	10	125	0.80	6	1200	3	266	240	106	
TMJB156K016#C^C	B	15	16	85	10	125	1.20	6	1200	3	266	240	106	
TMJC226K016#C^C	C	22	16	85	10	125	1.76	6	350	3	561	505	224	
TMJC336K016#C^C	C	33	16	85	10	125	2.64	6	350	3	561	505	224	
TMJD476K016#C^C	D	47	16	85	10	125	3.76	6	200	3	866	779	346	
TMJD686K016#C^C	D	68	16	85	10	125	5.44	6	200	3	866	779	346	
TMJE107K016#C^C	E	100	16	85	10	125	8.00	6	150	3	1049	944	420	
TMJE157K016#C^C	E	150	16	85	10	125	12	6	150	3	1049	944	420	
TMJU227K016#C^C	U	220	16	85	10	125	17.6	1	200	3	908	817	363	
20 Volt @ 85°C														
TMJA155K020#CQXC	A	1.5	20	85	13	125	0.15	6	3000	3	158	142	63	
TMJA225K020#CQXC	A	2.2	20	85	13	125	0.22	6	3000	3	158	142	63	
TMJA335K020#C^C	A	3.3	20	85	13	125	0.33	6	3000	3	158	142	63	
TMJB475K020#C^C	B	4.7	20	85	13	125	0.47	6	1000	3	292	262	117	
TMJB685K020#C^C	B	6.8	20	85	13	125	0.68	6	1000	3	292	262	117	
TMJC106K020#C^C	C	10	20	85	13	125	1	6	500	3	469	422	188	
TMJC156K020#C^C	C	15	20	85	13	125	1.5	6	500	3	469	422	188	
TMJC226K020#C^C	C	22	20	85	13	125	2.2	6	500	3	469	422	188	
TMJD336K020#C^C	D	33	20	85	13	125	3.3	6	250	3	775	697	310	
TMJD476K020#C^C	D	47	20	85	13	125	4.70	6	250	3	775	697	310	
TMJE686K020#C^C	E	68	20	85	13	125	6.8	6	200	3	908	817	363	
TMJE107K020#C^C	E	100	20	85	13	125	10	6	200	3	908	817	363	
TMJU157K020#CQXC	U	150	20	85	13	125	15	12	250	3	812	731	325	
25 Volt @ 85°C														
TMJA105K025#CQXC	A	1	25	85	17	125	0.13	4	3000	3	158	142	63	
TMJA155K025#CQXC	A	1.5	25	85	17	125	0.19	6	3000	3	158	142	63	
TMJB225K025#C^C	B	2.2	25	85	17	125	0.28	6	2000	3	206	186	82	
TMJB335K025#C^C	B	3.3	25	85	17	125	0.41	6	2000	3	206	186	82	

TMJ Tantalum SMD S1gma™ Series Capacitors



RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (μA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	MSL	100kHz RMS Current (mA)		
											25°C	85°C	125°C
TMJB475K025#C^C	B	4.7	25	85	17	125	0.59	6	2000	3	206	186	82
TMJC685K025#C^C	C	6.8	25	85	17	125	0.85	6	600	3	428	385	171
TMJC106K025#C^C	C	10	25	85	17	125	1.25	6	600	3	428	385	171
TMJC156K025#C^C	C	15	25	85	17	125	1.88	6	600	3	428	385	171
TMJD226K025#CQYA	D	22	25	85	17	125	0.55	6	400	3	612	551	245
TMJD226K025#C^C	D	22	25	85	17	125	2.75	6	400	3	612	551	245
TMJD336K025#CQYA	D	33	25	85	17	125	0.82	6	400	3	612	551	245
TMJD336K025#C^C	D	33	25	85	17	125	4.13	6	400	3	612	551	245
TMJD476K025#C^C	D	47	25	85	17	125	5.88	6	400	3	612	551	245
TMJU686K025#CQXC	U	68	25	85	17	125	8.5	12	450	3	606	545	242
TMJU107K025#CQXC	U	100	25	85	17	125	12.5	12	450	3	606	545	242
35 Volt @ 85°C													
TMJA334K035#CQXC	A	0.33	35	85	23	125	0.1	4	6000	3	112	101	45
TMJA474K035#CQXC	A	0.47	35	85	23	125	0.1	4	6000	3	112	101	45
TMJA684K035#CQXC	A	0.68	35	85	23	125	0.12	4	6000	3	112	101	45
TMJB105K035#CQXC	B	1	35	85	23	125	0.18	4	2500	3	184	166	74
TMJB155K035#C^C	B	1.5	35	85	23	125	0.26	6	2500	3	184	166	74
TMJB225K035#C^C	B	2.2	35	85	23	125	0.39	6	2500	3	184	166	74
TMJB335K035#C^C	B	3.3	35	85	23	125	0.58	6	2500	3	184	166	74
TMJC475K035#CQYA	C	4.7	35	85	23	125	0.16	6	600	3	428	385	171
TMJC475K035#C^C	C	4.7	35	85	23	125	0.82	6	600	3	428	385	171
TMJC685K035#C^C	C	6.8	35	85	23	125	1.19	6	600	3	428	385	171
TMJC106K035#C^C	C	10	35	85	23	125	1.75	6	600	3	428	385	171
TMJD156K035#CQYA	D	15	35	85	23	125	0.52	6	400	3	612	551	245
TMJD156K035#C^C	D	15	35	85	23	125	2.63	6	400	3	612	551	245
TMJD226K035#CQYA	D	22	35	85	23	125	0.77	6	400	3	612	551	245
TMJD226K035#C^C	D	22	35	85	23	125	3.85	6	400	3	612	551	245
TMJE336K035#CQYA	E	33	35	85	23	125	1.15	6	250	3	812	731	325
TMJE336K035#C^C	E	33	35	85	23	125	5.78	6	250	3	812	731	325
TMJU476K035#CQXC	U	47	35	85	23	125	8.23	12	300	3	742	667	297
TMJU476K035#CQYA	U	47	35	85	23	125	1.64	12	300	3	742	667	297
50 Volt @ 85°C													
TMJA224K050#CQXC	A	0.22	50	85	33	125	0.1	4	7000	3	104	93	41
TMJA334K050#CQXC	A	0.33	50	85	33	125	0.1	4	7000	3	104	93	41
TMJB474K050#CQXC	B	0.47	50	85	33	125	0.12	4	2000	3	206	186	82
TMJB684K050#CQXC	B	0.68	50	85	33	125	0.17	4	2000	3	206	186	82
TMJC105K050#C^C	C	1	50	85	33	125	0.25	4	1500	3	271	244	108
TMJC155K050#C^C	C	1.5	50	85	33	125	0.38	6	1500	3	271	244	108
TMJC225K050#CQYA	C	2.2	50	85	33	125	0.11	6	1500	3	271	244	108
TMJC225K050#C^C	C	2.2	50	85	33	125	0.55	6	1500	3	271	244	108
TMJC335K050#CQYA	C	3.3	50	85	33	125	0.17	6	1500	3	271	244	108
TMJC335K050#C^C	C	3.3	50	85	33	125	0.83	6	1500	3	271	244	108
TMJD475K050#C^C	D	4.7	50	85	33	125	1.18	4.5	600	3	500	450	200
TMJD685K050#C^C	D	6.8	50	85	33	125	1.7	4.5	600	3	500	450	200
TMJE106K050#CQYA	E	10	50	85	33	125	0.5	4.5	400	3	642	578	257
TMJE106K050#C^C	E	10	50	85	33	125	2.5	4.5	400	3	642	578	257
TMJU156K050#CQXC	U	15	50	85	33	125	3.75	12	450	3	606	545	242
TMJU226K050#CQXC	U	22	50	85	33	125	5.5	12	450	3	606	545	242

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalogue limit post mounting.

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

TMJ Tantalum SMD S1gma™ Series Capacitors



QUALIFICATION TABLE

TEST	TMJ S1gma™ series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
Endurance	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 125°C temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
Storage Life	Determine after application of 125°C temperature, unpowered for 2000 +48/-0 hours at 125 ± 2°C and then leaving 1 - 2 hours at room temperature.			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
Humidity	Determine after leaving for 500 hours at 65 ± 2°C and 90 - 95% relative humidity and then leaving 1 - 2 hours at room temperature.			Visual examination	no visible damage					
				DCL	3 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
Biased Humidity	Determine after leaving for 1000 hours at 85±2°C, 85% relative humidity and rated voltage and then recovery 1-2 hours at room temperature.			Visual examination	no visible damage					
				DCL	3 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	15 x IL*	1.5 x IL*
	2	-55+0/-3	15	ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+15/-0%	±5%
	3	+20±2	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	4	+85+3/-0	15							
	5	+125+3/-0	15							
	6	+20±2	15	ESR	1.25 x IL*	2.5 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*
Surge Voltage	Test temperature: 125°C+3/0°C Test voltage: Category voltage at 125°C Surge voltage: 1.3 x category voltage at 125°C Series protection resistance 1000±100Ω Discharge resistance: 1000Ω Number of cycles: 1000x Cycle duration: 6 min (30 sec charge, 5 min 30 sec discharge)			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±5% of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					

*Initial Limit