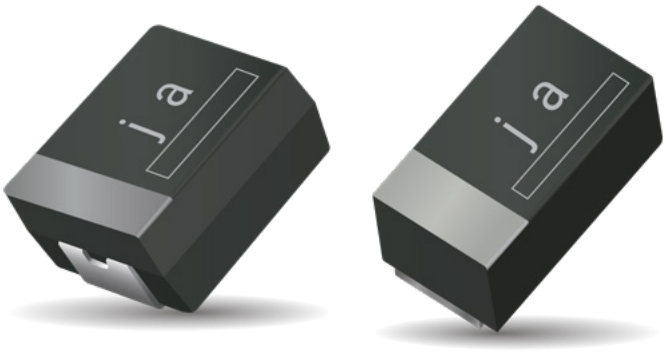
TC Series

Chip Tantalum Capacitors (Large Capacitance)



FEATURES

- Ta-MnO_2 technology
- Low DCL
- Parameters stability over voltage and time
- Undertab and J-lead LF

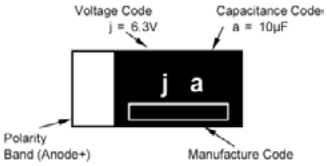
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

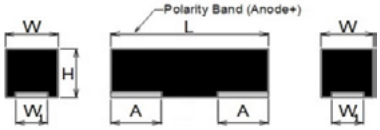
APPLICATIONS

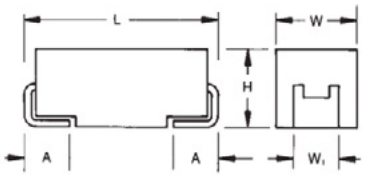
- DC/DC
- Industrial
- Telecom
- IoT
- Home applications
- Sensors

RoHS COMPLIANT

MARKING







CASE DIMENSIONS:

millimeters (inches)

Code	EIA Code	EIA Metric	L±0.10 (0.004)	W±0.10 (0.004)	H±0.10 (0.004)	W1±0.10 (0.004)	A±0.10 (0.004)
M	0603	1608-09	1.60 (0.063)	0.85 (0.033)	0.80 (0.031)	0.55 (0.022)	0.50 (0.020)

CASE DIMENSIONS:

millimeters (inches)

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W±0.20 (0.008)	H±0.20 (0.008)	W1±0.20 (0.008)	A±0.30 (0.012)
A	1206	3216-18	3.20 (0.126)	1.60 (0.063)	1.60 (0.063)	1.20 (0.047)	0.80 (0.031)
P	0805	2012-12	2.00 (0.079)	1.25 (0.049)	1.20 (0.047) max.	0.90 (0.035)	0.45 (0.018)

HOW TO ORDER

TC	M	0J	475	M	8R	-	□□□
Type	**Case Size** See table above	**Rated DC Voltage** 0G = 4Vdc 0J = 6.3Vdc 1A = 10Vdc 1C = 16Vdc 1D = 25Vdc 1E = 25Vdc 1V = 35Vdc	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Packaging** 8 = Tape width R = Positive electrode on the side opposite to sprocket hole		**Discrimination code**

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25ºC
Capacitance Range:	1µF to 100µF
Capacitance Tolerance:	±20%
Leakage Current DCL:	Please see the ratings and part number reference table below
Temperature Range:	-55ºC to +125°C

Note: Conductive Polymer Capacitors are designed to operate within the limits of the environmental conditions specified for each series. If operated continuously at their maximum temperature and / or humidity limit, or beyond these limits, capacitors may exhibit a parametric shift in capacitance and increases in ESR. These changes may occur earlier if the specified environmental conditions are exceeded. Similarly, their normal operational time period will be significantly extended if their general duty cycle includes operation below maximum temperature within humidity controlled environments. Careful attention should be paid to maximum temperature with associated high humidity environments as well as voltage derating, ripple current and current surges.
Please reference the KYOCERA AVX Conductive Polymer Capacitor Guidelines for more information or contact factory for application assistance

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) @ 85ºC						Cap Code
µF	Code	4V (g)	6.3V (j)	10V (A)	16V (C)	20V(D)	25V(E)	
1.0	105			P	A,M,P	A	A,M,P	A
1.5	155				A			E
2.2	225		P	A,M,P	A,M			J
3.3	335			A,P	A		A	N
4.7	475		A,M,P	A,M,P	A	A	A	S
6.8	685		P	A	A			W
10	106	P	A,M,P	A,M,P	A			a
15	156		P	A				e
22	226	M, P	A,M,P	A	A			j
33	336	A	A,M	A				n
47	476		A					s
100	107	A						ā

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

RATINGS & PART NUMBER REFERENCE

Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Maximum Operating Temp. (°C)	DCL Max. (µA)	DF Max. (%)	Impedance @100kHz (Ω)	MSL
4 Volt								
TCP0G106M8R	P	10	4	125	0.5	20	9.3	1
TCM0G226M8R	M	22	4	125	0.9	20	9	1
TCP0G226M8R	P	22	4	125	0.9	20	7.7	1
TCA0G336M8R	A	33	4	125	1.3	10	3.5	1
TCA0G107M8R	A	100	4	125	4.0	30	3	1
6.3 Volt								
TCP0J225M8R	P	2.2	6.3	125	0.5	20	17.5	1
TCA0J475M8R	A	4.7	6.3	125	0.5	8	4.9	1
TCM0J475M8R	M	4.7	6.3	125	0.5	20	9	1
TCP0J475M8R	P	4.7	6.3	125	0.5	20	11.8	1
TCP0J685M8R	P	6.8	6.3	125	0.5	20	9.3	1
TCA0J106M8R	A	10	6.3	125	0.6	8	4	1
TCM0J106M8R	M	10	6.3	125	0.6	20	9	1
TCP0J106M8R	P	10	6.3	125	0.6	20	8.3	1
TCP0J156M8R	P	15	6.3	125	0.9	20	7.7	1
TCA0J226M8R	A	22	6.3	125	1.4	14	3.5	1
TCM0J226M8R-V1	M	22	6.3	125	13.0	30	9	1
TCP0J226M8R	P	22	6.3	125	1.4	25	5	1
TCA0J336M8R	A	33	6.3	125	2.1	12	3.2	1
TCM0J336M8R-V1	M	33	6.3	125	208.0	30	9	1
TCA0J476M8R	A	47	6.3	125	3.0	18	3.2	1
10 Volt								
TCP1A105M8R	P	1.0	10	125	0.5	10	17.5	1
TCA1A225M8R	A	2.2	10	125	0.5	6	5.6	1
TCM1A225M8R	M	2.2	10	125	0.5	20	13.5	1

RATINGS & PART NUMBER REFERENCE

Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Maximum Operating Temp. (°C)	DCL Max. (µA)	DF Max. (%)	Impedance @100kHz (Ω)	MSL
TCP1A225M8R	P	2.2	10	125	0.5	20	14.4	1
TCA1A335M8R	A	3.3	10	125	0.5	8	4.9	1
TCP1A335M8R	P	3.3	10	125	0.5	20	11.8	1
TCA1A475M8R	A	4.7	10	125	0.5	8	4.2	1
TCM1A475M8R	M	4.7	10	125	0.5	20	9	1
TCP1A475M8R	P	4.7	10	125	0.5	20	9.3	1
TCA1A685M8R	A	6.8	10	125	0.7	8	4	1
TCA1A106M8R	A	10	10	125	1.0	8	3	1
TCM1A106M8R	M	10	10	125	10.0	20	9	1
TCP1A106M8R	P	10	10	125	1.0	20	7.7	1
TCA1A156M8R	A	15	10	125	1.5	10	3.5	1
TCA1A226M8R	A	22	10	125	2.2	12	3.2	1
TCA1A336M8R	A	33	10	125	3.3	8	1.7	1
16 Volt								
TCA1C105M8R	A	1.0	16	125	0.5	6	7	1
TCM1C105M8R	M	1.0	16	125	0.5	10	15	1
TCP1C105M8R	P	1.0	16	125	0.5	10	16.1	1
TCA1C155M8R	A	1.5	16	125	0.5	6	5.6	1
TCA1C225M8R	A	2.2	16	125	0.5	6	4.9	1
TCM1C225M8R	M	2.2	16	125	0.5	20	13.5	1
TCA1C335M8R	A	3.3	16	125	0.5	6	4.8	1
TCA1C475M8R	A	4.7	16	125	0.8	6	3.9	1
TCA1C685M8R	A	6.8	16	125	1.1	6	3.8	1
TCA1C106M8R	A	10	16	125	1.6	8	3.5	1
TCA1C226M8R	A	22	16	125	3.5	30	2.3	1
20 Volt								
TCA1D105M8R	A	1.0	20	125	0.5	6	7	1
TCA1D475M8R	A	4.7	20	125	0.9	6	3.9	1
25 Volt								
TCA1E105M8R	A	1.0	25	125	0.5	6	7	1
TCM1E105M8R	M	1.0	25	125	0.5	10	10	1
TCP1E105M8R	P	1.0	25	125	0.6	20	9.3	1
TCA1E335M8R	A	3.3	25	125	0.8	6	4.8	1

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.
All technical data relates to an ambient temperature of +25C.

Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 1.5 volts.
DCL is measured at rated voltage after 5 minutes.
Impedance allowed to move up to 1.25 times catalog limit post mounting.

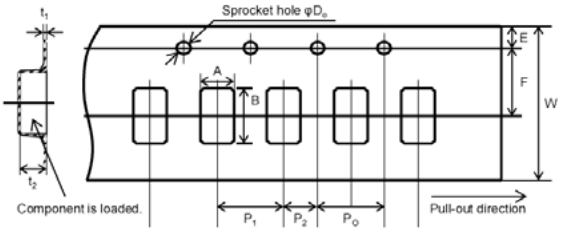
NOTE: KYOCERA AVX reserves the rights to supply higher voltage rating in the same case size, to the same reliability standards.

QUALIFICATION TABLE

TEST	TC series (Temperature range -55°C to +125°C)					
	Condition		Characteristics			
Endurance	Apply rated voltage (Ur) at 85°C for 1000hrs (for M and P case) 2000hrs (for A case) through a serial resistence of ≤3.0Ω. Stabilize at room temperature for 24 hours before measuring.		Visual examination	no visible damage		
			DCL	2x initial limit		
			ΔC/C	within ±30% of initial value (M case), ±20% (A,P case)		
			DF	2x initial limit		
Humidity	Store at 60±2°C, 90-95% relative humidity for 500+ 12/0 hours. Stabilize at room temperature and humidity for 24 hours before measuring.		Visual examination	no visible damage		
			DCL	2x initial limit		
			ΔC/C	within ±30% of initial value (M case), ±20% (A,P case)		
			DF	2x initial limit		
Temperature Stability	Step / Temperature°C / Duration(min): 1 / -55 / 15; 2 / +85 / 15; 3 / +125 / 15			-55°C	+85°C	+125°C
			DCL	n/a	10xIL*	12.5xIL*
			ΔC/C	0/-30%	+15/-5%	+20/-5%
			DF	IL*	IL*	IL*
Surge Voltage	Apply 1.3x rated voltage (Ur) at 85±2°C for 1000 cycles, 300sec charge and 30sec discharge resistance 1000Ω.		Visual examination	no visible damage		
			DCL	2x initial limit		
			ΔC/C	±20% of initial limit		
			DF	2x initial limit		
Vibration	4.17 JIS C 5101-1 Frequency: 10 to 55 to 10Hz/min. Amplitude: 1.5mm Time: 2hours each in X and Y directions		Visual examination	no visible damage		
			DCL	initial limit		
			ΔC/C	within ± 5% of initial value		
			DF	initial limit		

*Initial Limit
For use outside of recommended conditions and special request, please contact KYOCERA AVX.
Initial measurement max. 1hr after the removal from dry pack or after pretreatment at 85°C for 24 hours.

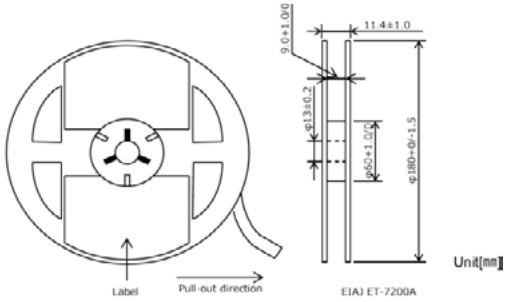
PACKAGING SPECIFICATIONS



Unit (mm)

Case	A±0.10	B±0.10	W±0.20	E±0.10	F±0.05	P1±0.10	P2±0.05	PO±0.10	DO+0.10/0	t1±0.05	t2±0.10	Standard packaging quantity
A	1.90	3.50	8.00	1.75	3.50	4.00	2.00	4.00	φ1.50	0.25	1.90	2,000 pcs
M	1.00	1.85	8.00	1.75	3.50	4.00	2.00	4.00	φ1.50	0.20	1.00	4,000 pcs
P	1.55	2.30	8.00	1.75	3.50	4.00	2.00	4.00	φ1.55±0.05	0.25	1.32	3,000 pcs

REEL DIMENSIONS



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