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

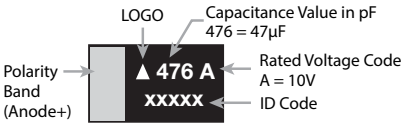
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

APPLICATIONS

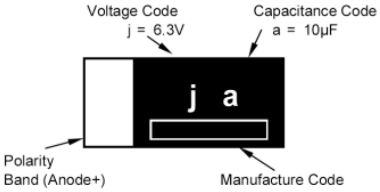
- DC/DC
- Industrial
- Telecom
- IoT
- Home applications
- Sensors

RoHS COMPLIANT

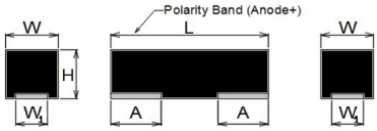
MARKING A CASE



M, P CASE



UNDERTAB M CASE

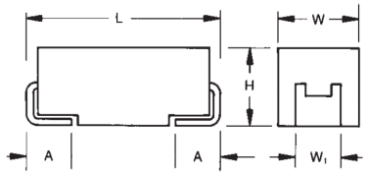


CASE DIMENSIONS:

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)

J-LEAD A, P CASE



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 = 20Vdc 1E = 25Vdc 1H = 50Vdc	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K = ±10% M = ±20%	**Packaging** 8 = Tape width R = Positive electrode on the side opposite to sprocket hole		**Discrimination code**

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TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25ºC
Capacitance Range:	0.15µF to 100µF
Capacitance Tolerance:	±20%
Leakage Current DCL:	Please see the ratings and part number reference table below
Temperature Range:	-55ºC to +125°C

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)	50V(H)	
0.15	154							A	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	A,M,P	A,M,P	A*,M,P	A*				a
15	156		P	A					e
22	226	A,M, P	A,M,P	A	A				j
33	336	A	A,M	A					n
47	476	A	A						s
68	686	A							w
100	107	A							ā

Released ratings (*K tolerance is also available)
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								
TCA0G106M8R	A	10	4	125	0.5	8	4.2	1
TCM0G106M8R	M	10	4	125	0.5	20	9	1
TCP0G106M8R	P	10	4	125	0.5	20	9.3	1
TCA0G226M8R	A	22	4	125	0.9	8	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
TCA0G476M8R	A	47	4	125	1.9	12	3.2	1
TCA0G686M8R	A	68	4	125	2.7	18	3	1
TCA0G107M8R	A	100	4	125	4.0	30	3	1
TCA0G107M8R-02	A	100	4	125	3.8	30	4	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
TCM0J106M8R-02	M	10	6.3	125	0.6	20	9	1
TCM0J106M8R-CA2	M	10	6.3	125	0.3	20	8	1
TCP0J106M8R	P	10	6.3	125	0.6	20	8.3	1
TCP0J106M8R-02	P	10	6.3	125	0.1	20	6	1
TCP0J106M8R-Y1	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	10	3.5	1
TCM0J226M8R-CA2	M	22	6.3	125	6.9	20	8	1
TCM0J226M8R-EV2	M	22	6.3	125	13.0	30	9	1
TCM0J226M8R-V1	M	22	6.3	125	13.0	30	9	1
TCP0J226M8R	P	22	6.3	125	1.4	25	5	1
TCP0J226M8R-02	P	22	6.3	125	1.4	25	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
TCA0J336M8R	A	33	6.3	125	2.1	12	3.2	1
TCA0J336M8R-E1	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
TCA0J476M8R-02	A	47	6.3	125	3.0	18	3.2	1
TCA0J476M8R-E1	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
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
TCM1A475M8R-E1	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
TCA1A106*8R	A	10	10	125	1.0	8	3	1
TCM1A106M8R	M	10	10	125	10.0	20	9	1
TCM1A106M8R-02	M	10	10	125	10.0	20	9	1
TCM1A106M8R-CA2	M	10	10	125	2.0	20	8	1
TCP1A106M8R	P	10	10	125	1.0	20	7.7	1
TCP1A106M8R-02	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
TCM1C105M8R-02	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
TCM1C225M8R-CA2	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
TCA1C106*8R	A	10	16	125	1.6	8	3.5	1
TCA1C106K8R-02	A	10	16	125	1.6	8	3.5	1
TCA1C106M8R-02	A	10	16	125	1.3	8	2.6	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
TCA1E475M8R	A	4.7	25	125	1.2	8	3.4	1
50 Volt								
TCA1H154M8R	A	0.15	50	125	0.5	4	15	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.

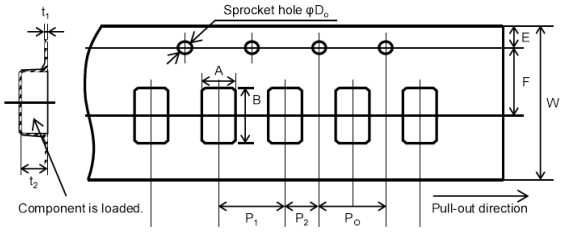
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QUALIFICATION TABLE

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.

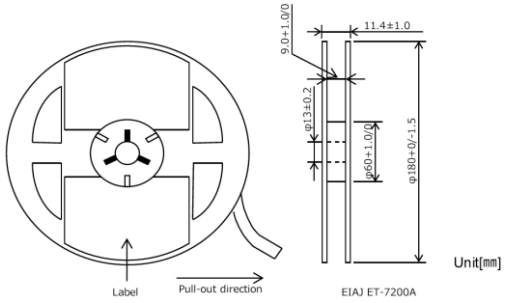
PACKAGING SPECIFICATIONS



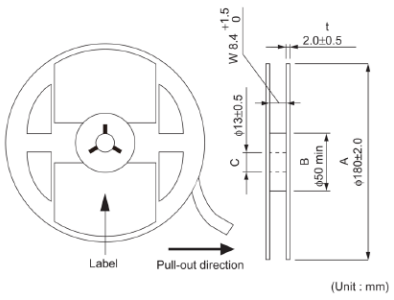
Unit (mm)

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	1.83	3.57	8.00	1.75	3.50	4.00	2.00	4.00	φ1.50	0.17	1.87	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 M, P CASE



REEL DIMENSIONS A CASE



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