

TCS Series

Chip Tantalum Capacitors (Extra Large Capacitance)



FEATURES

- Ta-MnO₂ technology
- Low DCL
- High CV
- Parameters stability over voltage and time
- Undertab LF

APPLICATIONS

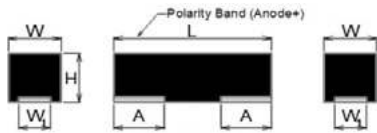
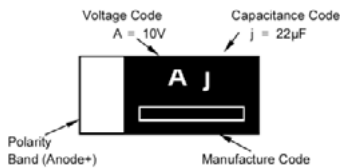
- For high component density PCB design
- DC/DC
- Industrial
- Telecom
- IoT
- Home applications
- Sensors



LEAD-FREE
LEAD-FREE COMPATIBLE
COMPONENT



MARKING



CASE DIMENSIONS:

millimeters (inches)

Code	EIA Code	EIA Metric	L+0.20-0.00 (0.008)	W±0.10 (0.004)	H+0.20-0.00 (0.008)	W1±0.10 (0.004)	A±0.10 (0.004)
M	0603	1608-10	1.60 (0.063)	0.85 (0.033)	0.80 (0.031)	0.55 (0.022)	0.50 (0.020)
P	0805	2012-12	2.00±0.20 (0.079±0.008)	1.25±0.20 (0.049±0.008)	1.20 (0.047) max.	0.85±0.20 (0.033±0.008)	0.50 (0.020)
PS	0805	2012-09	2.00±0.20 (0.079±0.008)	1.25±0.20 (0.049±0.008)	0.90 (0.035) max.	0.85±0.20 (0.033±0.008)	0.50 (0.020)

HOW TO ORDER

TCS

Type

M□

Case Size
See table above

1A

Rated DC Voltage
1G = 4Vdc
1J = 6.3Vdc
1A = 10Vdc
1C = 16Vdc
1D = 20Vdc

226

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

M

Tolerance
M = ±20%

8R

Packaging
8 = Tape width
R = Positive electrode on the side opposite to sprocket hole

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Discrimination code

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C
Capacitance Range:	10µF to 220µF
Capacitance Tolerance:	±20%
Leakage Current DCL:	Please see the ratings and part number reference table below
Temperature Range:	-55°C 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.

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CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) @ 85°C					Cap Code
μF	Code	4V(G)	6.3V(J)	10V (A)	16V (C)	20V(D)	
10	106				M	P	a
22	226			M			j
47	476		M	P, PS			s
100	107	M	P				
150	157		P				
220	227	P					

Released ratings

Note: Voltage ratings are minimum values. KYOCERA AVX reserves the right to supply higher 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. ($^{\circ}\text{C}$)	DCL Max. (μA)	DF Max. (%)	ESR @100kHz (Ω)	MSL	
4 Volt									
TCSM0G107M8R-V1	M	100	4	125	80.0	40	4	2	
TCSP0G227M8R-V1	P	220	4	125	88.0	40	3	2	
6.3 Volt									
TCSM0J476M8R-V1	M	47	6.3	125	29.7	40	4	2	
TCSP0J107M8R-V1	P	100	6.3	125	63.0	40	3	2	
TCSP0J157M8R-V1	P	150	6.3	125	95.0	40	3	2	
10 Volt									
TCSM1A226M8R	M	22	10	125	11.0	30	5	2	
TCSP1A476M8R	P	47	10	125	24.0	30	4	2	
TCSPS1A476M8R-V1	PS	47	10	125	23.5	30	*	2	
16 Volt									
TCSM1C106M8R	M	10	16	125	8.0	20	6	2	
20 Volt									
TCSP1D106M8R	P	10	20	125	10.0	20	6	2	

*Impedance 4 Ω

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.

ESR 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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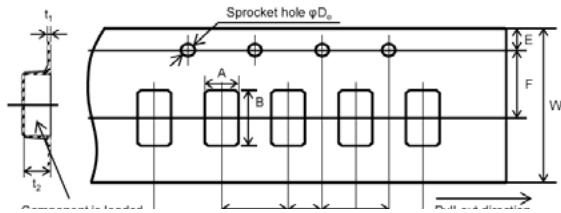
QUALIFICATION TABLE

TEST	TCS series (Temperature range -55°C to +125°C)			
	Condition		Characteristics	
Endurance	Apply rated voltage (Ur) at 85°C for 1000hrs through a serial resistance of ≤3.0Ω. Stabilize at room temperature for 24 hours before measuring.		Visual examination	no visible damage
			DCL	2x initial limit
			ΔC/C	within ±20% of initial value (M, PS case), ±30% (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, P case), ±20% (PS)
			DF	2x initial limit
Temperature Stability	Step	Temperature°C	Duration(min)	
	1	-55	15	
	2	+85	15	
	3	+125	15	
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	±30% of initial limit (M, P case), ±20% (PS)
			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
M	1.15	2.00	8.00	1.75	3.50	4.00	2.00	4.00	φ1.50	0.20	1.00	3,000 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
PS	1.60	2.40	8.00	1.75	3.50	4.00	2.00	4.00	φ1.50	0.25	1.05±0.05	3,000 pcs

REEL DIMENSIONS

