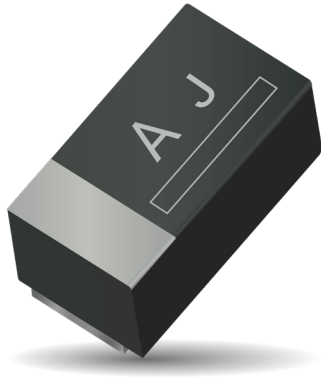


# TCS Series

## Chip Tantalum Capacitors (Extra Large Capacitance)



### FEATURES

- Ta-MnO<sub>2</sub> technology
- Low DCL
- High CV
- Parameters stability over voltage and time
- Undertab LF

### APPLICATIONS

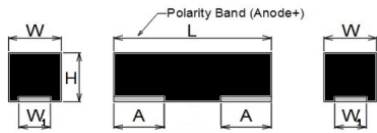
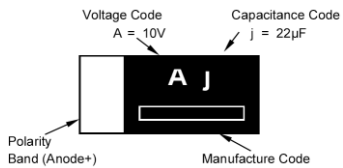
- For high component density PCB design
- DC/DC
- Industrial
- Telecom
- IoT
- Home applications
- Sensors



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)	W <sub>1</sub> ±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  
0G = 4Vdc  
0J = 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

-

□□□

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

# TCS Series

## Chip Tantalum Capacitors (Extra Large Capacitance)



### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V <sub>R</sub> ) @ 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				ā
150	157		P				ē
220	227	P					ĵ

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. (°C)	DCL Max. (μA)	DF Max. (%)	ESR @100kHz (Ω)	MSL
<b>4 Volt</b>								
TCSM0G107M8R-AV1	M	100	4	125	80.0	40	2	2
TCSM0G107M8R-V1	M	100	4	125	80.0	40	4	2
TCSP0G227M8R-V1	P	220	4	125	88.0	40	3	2
<b>6.3 Volt</b>								
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
<b>10 Volt</b>								
TCSM1A226M8R	M	22	10	125	11.0	30	5	2
TCSM1A226M8R-02	M	22	10	125	11.0	30	5	2
TCSP1A476M8R	P	47	10	125	24.0	30	4	2
TCSP1A476M8R-V1	PS	47	10	125	23.5	30	*	2
<b>16 Volt</b>								
TCSM1C106M8R	M	10	16	125	8.0	20	6	2
<b>20 Volt</b>								
TCSP1D106M8R	P	10	20	125	10.0	20	6	2

\*Impedance 4Ω

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, 0.5RMS 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.**

# TCS Series

## Chip Tantalum Capacitors (Extra Large Capacitance)

### QUALIFICATION TABLE

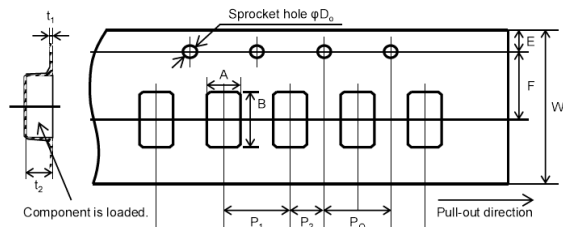
TEST	TCS series (Temperature range -55°C to +125°C)						
	Condition			Characteristics			
Endurance	Apply rated voltage (Ur) at 85°C for 1000hrs through a serial resistance of $\leq 3.0\Omega$ . Stabilize at room temperature for 24 hours before measuring.			Visual examination	no visible damage		
				DCL	2x initial limit		
				$\Delta C/C$	within $\pm 20\%$ of initial value (M, PS case), $\pm 30\%$ (P case)		
				DF	2x initial limit		
Humidity	Store at $60\pm 2^\circ\text{C}$ , 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		
				$\Delta C/C$	within $\pm 30\%$ of initial value (M, P case), $\pm 20\%$ (PS)		
				DF	2x initial limit		
Temperature Stability	Step	Temperature°C	Duration(min)		-55°C	+85°C	+125°C
	1	-55	15	DCL	n/a	10xIL*	12.5xIL*
	2	+85	15	$\Delta C/C$	0/-30% (M case) +15/-50% (P case) 0/-15% (PS case)	+15/-5% (M, P case) +15/0% (PS case)	+20/-5% ((M, P case) +20/0% (PS case)
	3	+125	15		DF	IL*	IL*
Surge Voltage	Apply 1.3x rated voltage (Ur) at $85\pm 2^\circ\text{C}$ for 1000 cycles, 300sec charge and 30sec discharge resistance 1000 $\Omega$ .			Visual examination	no visible damage		
				DCL	2x initial limit		
				$\Delta C/C$	$\pm 30\%$ of initial limit (M, P case), $\pm 20\%$ (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		
				$\Delta C/C$	within $\pm 5\%$ 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



Case	A $\pm 0.10$	B $\pm 0.10$	W $\pm 0.20$	E $\pm 0.10$	F $\pm 0.05$	P1 $\pm 0.10$	P2 $\pm 0.05$	PO $\pm 0.10$	DO+0.10/0	t1 $\pm 0.05$	t2 $\pm 0.10$	Standard packaging quantity
M	1.15	2.00	8.00	1.75	3.50	4.00	2.00	4.00	$\phi 1.50$	0.20	1.00	3,000 pcs
P	1.55	2.30	8.00	1.75	3.50	4.00	2.00	4.00	$\phi 1.55\pm 0.05$	0.25	1.32	3,000 pcs
PS	1.60	2.40	8.00	1.75	3.50	4.00	2.00	4.00	$\phi 1.50$	0.25	1.05 $\pm 0.05$	3,000 pcs

### REEL DIMENSIONS

