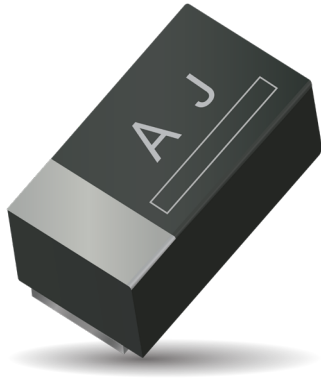


TCS Series

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

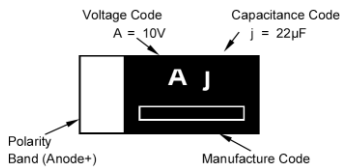


LEAD-FREE
LEAD-FREE COMPATIBLE
COMPONENT



RoHS
COMPLIANT

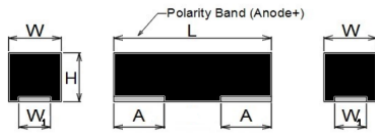
MARKING



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 ₁ ±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 _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 | | | | ā |
| 150 | 157 | | P | | | | ē |
| 220 | 227 | P | | | | | j̄ |

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 |
|------------------|-----------|------------------|-------------------|------------------------------|---------------|-------------|-----------------|-----|
| 4 Volt | | | | | | | | |
| 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 |
| 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 |
| 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 |
| 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 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)

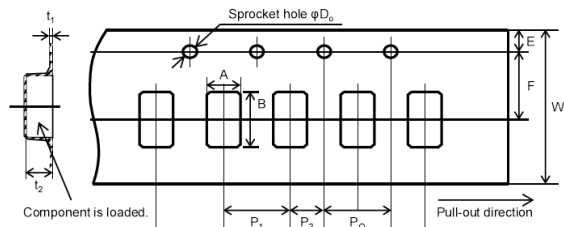
QUALIFICATION TABLE

| 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 $^\circ\text{C}$ | 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 Ω . | | | 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 ± 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 | $\phi 1.50$ | 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 ± 0.05 | 3,000 pcs |

REEL DIMENSIONS

