

TCSO Series

Conductive Polymer Chip Capacitors (Extra Large Capacitance)

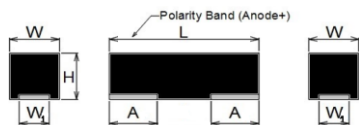


FEATURES

- Ta-polymer technology
- High ripple capability
- High CV
- Surge robust
- Undertab LF
-

APPLICATIONS

- For high component density PCB design like mobile, gaming, computer card
- IoT
- SSD
- Sensors



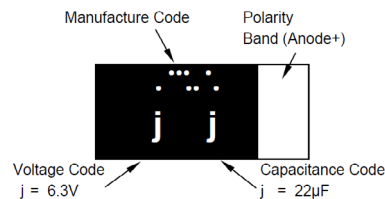
CASE DIMENSIONS:

millimeters (inches)

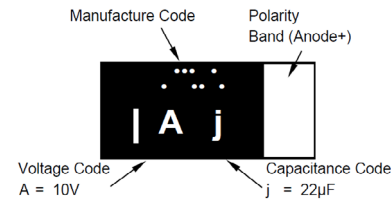
| Code | EIA Code | EIA Metric | L±0.20 (0.008) | W±0.20 (0.008) | H max. | W ₁ ±0.20 (0.008) | A±0.10 (0.004) |
|------|----------|------------|---------------------------------------|----------------------------|---------------------------------------|------------------------------|----------------|
| M | 0603 | 1608-10 | 1.60±0.20-0.00 (0.063±0.008-0.000) | 0.85±0.10 (0.033±0.004) | 0.80±0.20-0.00 (0.031±0.008-0.000) | 0.55±0.10 (0.022±0.004) | 0.50 (0.020) |
| PE | 0805 | 2012-08 | 2.00 (0.079) | 1.25 (0.049) | 0.80 (0.031) | 0.85 (0.033) | 0.50 (0.020) |
| PL | 0805 | 2012-10 | 2.00 (0.079) | 1.25 (0.049) | 0.90±0.10 (0.035±0.004) | 0.85 (0.033) | 0.50 (0.020) |
| PS | 0805 | 2012-09 | 2.00 (0.079) | 1.25 (0.049) | 0.90 (0.035) | 0.85 (0.033) | 0.50 (0.020) |

MARKING

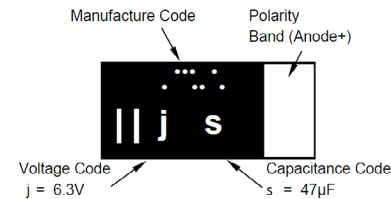
M, PE CASE



PL CASE



PS CASE



HOW TO ORDER

TCSO

Type

P□

Case Size
See table above

OK

Rated DC Voltage
0J = 6.3Vdc
OK = 8Vdc
1A = 10Vdc
1C = 16Vdc
1E = 25Vdc
1V = 38Vdc

336

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: | 1.0µF to 47µF |
| Capacitance Tolerance: | ±20% |
| Leakage Current DCL: | Please see the ratings and part number reference table below |
| Temperature Range: | -55°C to +105°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.

TCSO Series

Conductive Polymer Chip 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 | 6.3V(j) | 8V(k) | 10V(A) | 16V(C) | 25V(E) | 38V(V) | |
| 1.0 | 105 | | | | | | 500(PS) | A |
| 2.2 | 225 | | | | | | | J |
| 4.7 | 475 | | | | | 300,500(PL),500(PL),500(PS) | | S |
| 10 | 106 | | | 300(M) | 150(PL) | | | a |
| 22 | 226 | 200,300(M) | | 200(PL) | | | | j |
| 33 | 336 | | 150(PE) | | | | | n |
| 47 | 476 | 200,300(M),150,200(PL),150(PS) | 150(PS) | | | | | s |

Released ratings, (ESR ratings in mOhms)

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 Max. @100kHz (mΩ) | 100kHz RMS Current (mA) 45°C | MSL |
|--------------------|-----------|------------------|-------------------|------------------------------|---------------|-------------|-----------------------|------------------------------|-----|
| 6.3 Volt | | | | | | | | | |
| TCSOM0J226M8R-ZD1 | M | 22 | 6.3 | 105 | 13.9 | 15 | 200 | 418 | 3 |
| TCSOM0J226M8R | M | 22 | 6.3 | 105 | 13.9 | 15 | 300 | 341 | 3 |
| TCSOM0J226M8R-02 | M | 22 | 6.3 | 105 | 13.9 | 15 | 300 | 341 | 3 |
| TCSOM0J226M8R-029 | M | 22 | 6.3 | 105 | 13.9 | 15 | 300 | 341 | 3 |
| TCSOM0J476M8R-CD1 | M | 47 | 6.3 | 105 | 5.0 | 15 | 200 | 418 | 3 |
| TCSOM0J476M8R-CM1 | M | 47 | 6.3 | 105 | 5.0 | 15 | 300 | 341 | 3 |
| TCSOM0J476M8R-ZM1 | M | 47 | 6.3 | 105 | 29.7 | 15 | 300 | 341 | 3 |
| TCSOPL0J476M8R-CF1 | PL | 47 | 6.3 | 105 | 14.8 | 15 | 150 | 516 | 3 |
| TCSOPL0J476M8R-ZCT | PL | 47 | 6.3 | 105 | 29.7 | 15 | 150 | 516 | 3 |
| TCSOPL0J476M8R-ZF1 | PL | 47 | 6.3 | 105 | 29.7 | 15 | 150 | 516 | 3 |
| TCSOPL0J476M8R-ZF9 | PL | 47 | 6.3 | 105 | 29.7 | 15 | 150 | 516 | 3 |
| TCSOPL0J476M8R-ZD1 | PL | 47 | 6.3 | 105 | 29.7 | 15 | 200 | 447 | 3 |
| TCSOPS0J476M8R-ZF1 | PS | 47 | 6.3 | 105 | 29.7 | 15 | 150 | 516 | 3 |
| TCSOPS0J476M8R-ZF9 | PS | 47 | 6.3 | 105 | 29.7 | 15 | 150 | 516 | 3 |
| 8 Volt | | | | | | | | | |
| TCSOPE0K336M8R-ZF1 | PE | 33 | 8 | 105 | 26.4 | 15 | 150 | 516 | 3 |
| TCSOPS0K476M8R-ZF1 | PS | 47 | 8 | 105 | 37.6 | 15 | 150 | 516 | 3 |
| TCSOPS0K476M8R-ZF9 | PS | 47 | 8 | 105 | 37.6 | 15 | 150 | 516 | 3 |
| 10 Volt | | | | | | | | | |
| TCSOM1A106M8R-ZM1 | M | 10 | 10 | 105 | 10.0 | 15 | 300 | 341 | 3 |
| TCSOPL1A226M8R | PL | 22 | 10 | 105 | 22.0 | 15 | 200 | 447 | 3 |
| 16 Volt | | | | | | | | | |
| TCSOPL1C106M8R-ZF1 | PL | 10 | 16 | 105 | 48.0 | 10 | 150 | 516 | 3 |
| 25 Volt | | | | | | | | | |
| TCSOPL1E475M8R-ZM1 | PL | 4.7 | 25 | 105 | 11.8 | 10 | 300 | 365 | 3 |
| TCSOPL1E475M8R-ZT1 | PL | 4.7 | 25 | 105 | 11.8 | 10 | 500 | 283 | 3 |
| TCSOPS1E475M8R-ZT1 | PS | 4.7 | 25 | 105 | 11.8 | 10 | 500 | 282 | 3 |
| 38 Volt | | | | | | | | | |
| TCSOPS1V105M8R-UT1 | PS | 1.0 | 38 | 105 | 11.4 | 10 | 500 | 280 | 3 |

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.

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QUALIFICATION TABLE

| TEST | TCSO series (Temperature range -55°C to +105°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 | 4x initial limit | |
| | | | $\Delta C/C$ | within $\pm 20\%$ of initial value | |
| | | | DF | 3x initial limit | |
| Humidity | Store at $40\pm 2^\circ\text{C}$, 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 | 3x initial limit | |
| | | | $\Delta C/C$ | within $+30/-20\%$ of initial value | |
| | | | DF | 3x initial limit | |
| Temperature Stability | Step | Temperature $^\circ\text{C}$ | Duration(min) | | |
| | 1 | -55 | 15 | | |
| | 2 | +105 | 15 | | |
| | | | DCL | -55 $^\circ\text{C}$ | +105 $^\circ\text{C}$ |
| | | | $\Delta C/C$ | n/a | 10xIL* |
| 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 | |
| | | | $\Delta C/C$ | $\pm 20\%$ 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 | |
| | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | |
| | | | DF | initial limit | |

*Initial Limit

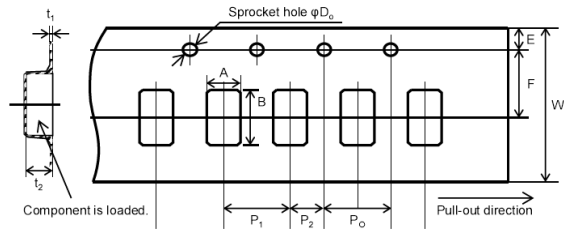
For use outside of recommended conditions and special request, please contact KYOCERA AVX.

Initial measurement max. 1hr after the removal from dry pack or after pretreatment at 85°C for 24 hours.

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PACKAGING SPECIFICATIONS

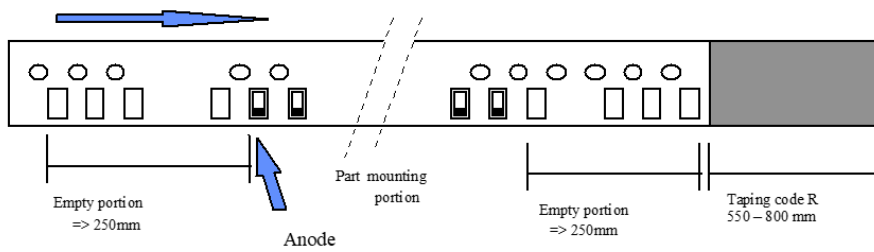


Unit (mm)

| 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±0.05 | Standard Packaging quantity |
|------|--------|--------|--------|--------|--------|---------|---------|---------|-----------|---------|-----------|-----------------------------|
| M | 1.15 | 2.00 | 8.00 | 1.75 | 3.50 | 4.00 | 2.00 | 4.00 | φ1.50 | 0.20 | 1.10±0.10 | 3,000 pcs |
| PE | 1.60 | 2.40 | 8.00 | 1.75 | 3.50 | 4.00 | 2.00 | 4.00 | φ1.50 | 0.25 | 1.05 | 4,000 pcs |
| PL | 1.60 | 2.40 | 8.00 | 1.75 | 3.50 | 4.00 | 2.00 | 4.00 | φ1.50 | 0.25 | 1.05 | 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 | 3,000 pcs |

Polarity of parts: as indicated in the drawing below, the anodes (+) are at the right with respect to the direction of the tape pull out (on the opposite side to the feeding holes).

Pull - out direction



End

Beginning

REEL DIMENSIONS

