TCSO Series

Conductive Polymer Chip Capacitors (Extra Large Capacitance)

FEATURES

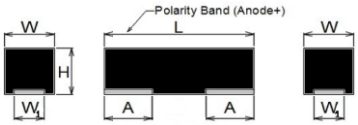
- Ta-polymer technology
- High ripple capability
- High CV
- Surge robust
- Undertab LF
-

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

APPLICATIONS

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



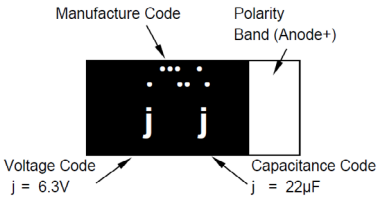
CASE DIMENSIONS:

millimeters (inches)

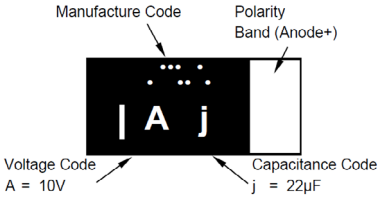
Code	EIA Code	EIA Metric	L±0.20 (0.008)	W±0.20 (0.008)	H max.	W1±0.20 (0.008)	A±0.10 (0.004)
M	0603	1608-10	1.60+0.20-0.00 (0.063+0.008-0.000)	0.85±0.10 (0.033±0.004)	0.80+0.20-0.00 (0.031+0.008-0.000)	0.55±0.10 (0.022±0.004)	0.50 (0.020)
PE	0805	2012-08	2.00 (0.079)	1.25 (0.049)	0.80 (0.031)	0.85 (0.033)	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

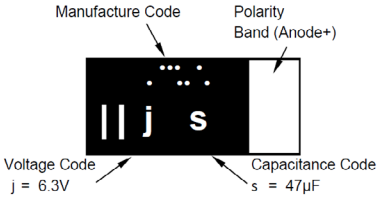
M, PE CASE



PL CASE



PS CASE



HOW TO ORDER

TCSO	P□	0K	336	M	8R	-	□□□
Type	**Case Size** See table above	**Rated DC Voltage** 0J = 6.3Vdc 0K = 8Vdc 1A = 10Vdc 1C = 16Vdc 1E = 25Vdc 1V = 38Vdc	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**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 +25ºC
Capacitance Range:	1.0µF to 47µF
Capacitance Tolerance:	±20%
Leakage Current DCL:	Please see the ratings and part number reference table below
Temperature Range:	-55ºC 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.

The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

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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	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 +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

<table>
<tr><th rowspan="2">TEST</th><th colspan="4">TCSO series (Temperature range -55°C to +105°C)</th></tr>
<tr><th colspan="2">Condition</th><th colspan="2">Characteristics</th></tr>
<tr><td rowspan="4">Endurance</td><td colspan="2" rowspan="4">Apply rated voltage (Ur) at 85°C for 1000hrs through a serial resistence of ≤3.0Ω.</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td>DCL</td><td>4x initial limit</td></tr>
<tr><td>ΔC/C</td><td>within ±20% of initial value</td></tr>
<tr><td>DF</td><td>3x initial limit</td></tr>
<tr><td rowspan="4">Humidity</td><td colspan="2" rowspan="4">Store at 40±2°C, 90-95% relative humidity for 500 hours.</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td>DCL</td><td>3x initial limit</td></tr>
<tr><td>ΔC/C</td><td>within +30/-20% of initial value</td></tr>
<tr><td>DF</td><td>3x initial limit</td></tr>
<tr><td rowspan="5">Temperature Stability</td><td colspan="2" rowspan="4"><table><tr><td>Step</td><td>Temperature°C</td><td>Duration(min)</td></tr><tr><td>1</td><td>-55</td><td>15</td></tr><tr><td>2</td><td>+105</td><td>15</td></tr></table></td><td></td><td>-55°C</td><td>+105°C</td></tr>
<tr><td>DCL</td><td>n/a</td><td>10xIL*</td></tr>
<tr><td>ΔC/C</td><td>0/-20%</td><td>+50/0%</td></tr>
<tr><td>DF</td><td>IL*</td><td>IL*</td></tr>
<tr><td rowspan="4">Surge Voltage</td><td colspan="2" rowspan="4">Apply 1.3x rated voltage (Ur) at 85±2°C for 1000 cycles, duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge /discharge resistance of 1000Ω.</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td>DCL</td><td>2x initial limit</td></tr>
<tr><td>ΔC/C</td><td>±20% of initial limit</td></tr>
<tr><td>DF</td><td>2x initial limit</td></tr>
<tr><td rowspan="4">Vibration</td><td colspan="2" rowspan="4">4.17 JIS C 5101-1
Frequency: 10 to 55 to 10Hz/min.
Amplitude: 1.5mm
Time: 2hours each in X and Y directions</td><td>Visual examination</td><td>no visible damage</td></tr>
<tr><td>DCL</td><td>initial limit</td></tr>
<tr><td>ΔC/C</td><td>within ± 5% of initial value</td></tr>
<tr><td>DF</td><td>initial limit</td></tr>
</table>

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

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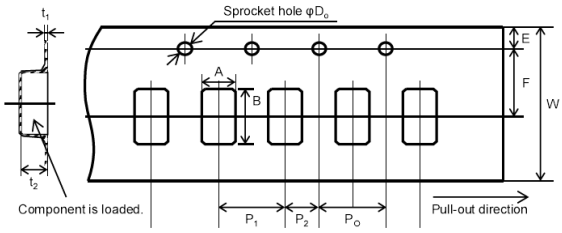
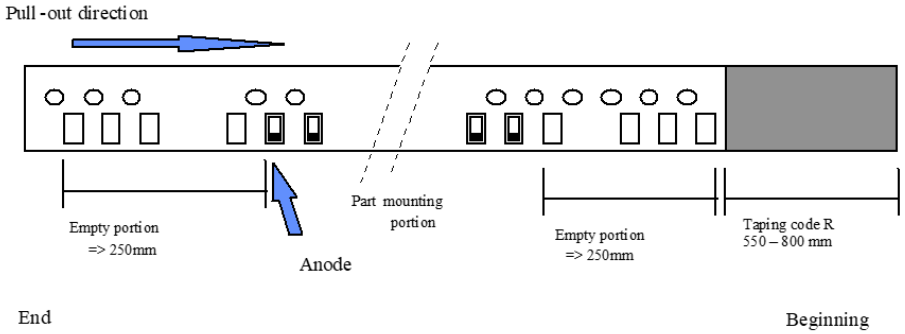
PACKAGING SPECIFICATIONS



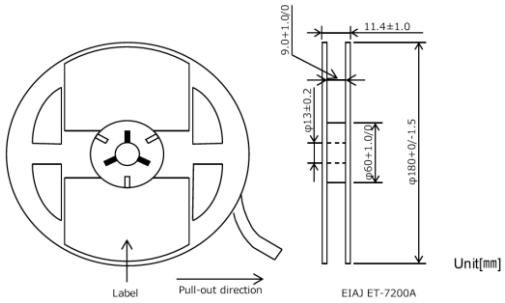
Unit (mm)

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).



REEL DIMENSIONS



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