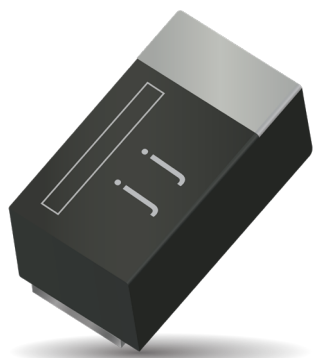




# TCSO Series

## Conductive Polymer Chip Capacitors (Extra Large Capacitance)



### FEATURES

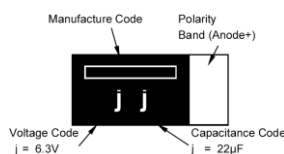
- Ta-polymer technology
- High ripple capability
- High CV
- Surge robust
- Undertab LF
- 

### APPLICATIONS

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



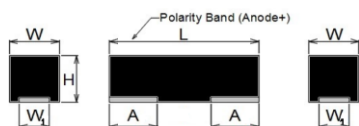
### MARKING



### CASE DIMENSIONS:

millimeters (inches)

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W±0.20 (0.008)	H max.	W <sub>1</sub> ±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)



### HOW TO ORDER

<b>TCSO</b>	<b>P□</b>	<b>OK</b>	<b>336</b>	<b>M</b>	<b>8R</b>	-	<b>□□□</b>
Type	Case Size See table above	Rated DC Voltage 0J = 6.3Vdc OK = 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 +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 <sub>R</sub> ) @ 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
<b>6.3 Volt</b>									
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
<b>8 Volt</b>									
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
<b>10 Volt</b>									
TCSOM1A106M8R-ZM1	M	10	10	105	10.0	15	300	341	3
TCSOPL1A226M8R	PL	22	10	105	22.0	15	200	447	3
<b>16 Volt</b>									
TCSOPL1C106M8R-ZF1	PL	10	16	105	48.0	10	150	516	3
<b>25 Volt</b>									
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
<b>38 Volt</b>									
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.**

# TCSO Series

## Conductive Polymer Chip Capacitors (Extra Large Capacitance)



### 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°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°C	Duration(min)		
	1	-55	15		
	2	+105	15		
			DCL	-55°C	+105°C
			$\Delta C/C$	n/a	10xIL*
Surge Voltage	Apply 1.3x rated voltage (Ur) at 85 $\pm$ 2°C for 1000 cycles, 300sec charge and 30sec discharge resistance 1000 $\Omega$ .		Visual examination	no visible damage	
			DCL	2x initial limit	
			$\Delta C/C$	$\pm 20\%$ 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

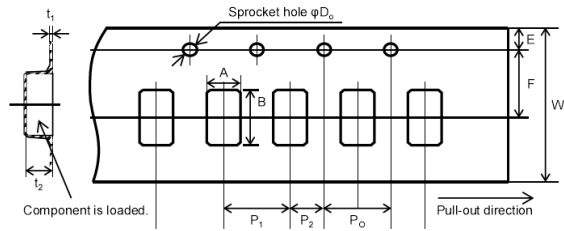
For use outside of recommended conditions and special request, please contact KYOCERA AVX.

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

# TCSO Series

## Conductive Polymer Chip Capacitors (Extra Large Capacitance)

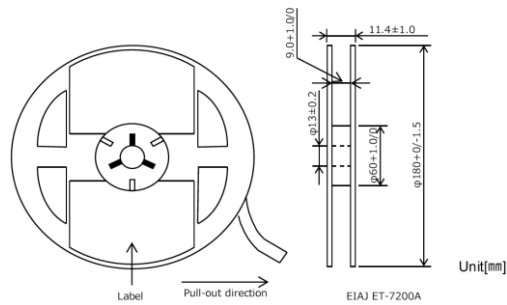
### PACKAGING SPECIFICATIONS



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

### REEL DIMENSIONS



## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View TCSOPL1E475M8R-ZM1 on WIN SOURCE](#)
- ⊖ [AVX Corp/Kyocera Corp Information](#)

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- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management