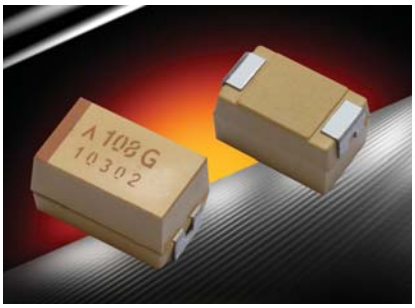
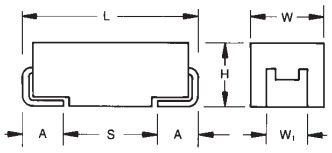
TCM Series

Conductive Polymer Solid Electrolytic Chip Multianode Capacitors





FEATURES

- Conductive polymer electrode, multianode design
- Benign failure mode under recommended use conditions
- Extremely Low ESR
- 3x reflow 260°C compatible
- Volumetric efficiency
- High frequency capacitance retention

APPLICATIONS

- Telecommunication routers
- Basestations with high power DC/DCs

Elektra Award 2010

LEAD-FREE

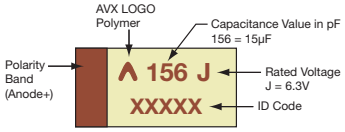
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

SnPb termination option is not RoHS compliant.

MARKING

E, V CASE



CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H+0.20 (0.008) -0.10 (0.004)	W_1±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
E	2917	7343-43	7.30 (0.287)	4.30 (0.169)	4.10 (0.162)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
V	2924	7361-38	7.30 (0.287)	6.10 (0.240)	3.55 (0.140)	3.10 (0.120)	1.30 (0.051)	4.40 (0.173)
W_1 dimension applies to the termination width for A dimensional area only.								

HOW TO ORDER

TCM	E	108	M	004	R	0010
Type	**Case Size** See table above	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M=±20%	**Rated DC Voltage** 002=2.5Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 035=35Vdc 100=100Vdc	**Packaging** R = Pure Tin 7" Reel S = Pure Tin 13" Reel H = Tin Lead 7" Reel (contact manufacturer) K = Tin Lead 13" Reel (contact manufacturer)	**ESR in mΩ**

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C						
Capacitance Range:	10 µF to 1000 µF						
Capacitance Tolerance:	±20%						
Leakage Current DCL:	0.1CV						
Rated Voltage (V_R)	≤ +85°C:	2.5	4	6.3	10	35	100
Category Voltage (V_C)	≤ +105°C:	2	3.2	5	8	28	80
Surge Voltage (V_S)	≤ +85°C:	3.3	5.2	8	13	46	130
Surge Voltage (V_S)	≤ +105°C:	2.5	4	6	10	35	100
Temperature Range:	-55ºC to +105ºC						
Reliability:	1% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance, 60% confidence level						
Termination Finish:	Sn Plating (standard) and SnPb Plating upon request						

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 AVX Conductive Polymer Capacitor Guidelines for more information or contact factory for application assistance.

TCM Series

Conductive Polymer Solid Electrolytic Chip Multianode Capacitors

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) to 85°C					
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	35V (V)	100V (A)
10	106						V(50)
22	226					E(25)	
33	336						
47	476						
68	686						
100	107						
150	157						
220	227						
330	337			E(10,15)	E(10,15)		
470	477			E(7,10)			
680	687		E(12)	E(12)			
1000	108	E(6,10)	E(6,8,10,12)				

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Maximum Operating Temperature (°C)	DCL Max. (µA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	MSL	100kHz RMS Current (mA)		
									45°C	85°C	105°C
2.5 Volt @ 85°C											
TCME108M002#0006	E	1000	2.5	105	250	10	6	3	8300	5800	3700
TCME108M002#0010	E	1000	2.5	105	250	10	10	3	6400	4500	2900
4 Volt @ 85°C											
TCME687M004#0012	E	680	4	105	272	8	12	3	5800	4100	2600
TCME108M004#0006	E	1000	4	105	400	8	6	3	8300	5800	3700
TCME108M004#0008	E	1000	4	105	400	8	8	3	7200	5000	3200
TCME108M004#0010	E	1000	4	105	400	8	10	3	6400	4500	2900
TCME108M004#0012	E	1000	4	105	400	8	12	3	5800	4100	2600
6.3 Volt @ 85°C											
TCME337M006#0010	E	330	6.3	105	198	8	10	3	6400	4500	2900
TCME337M006#0015	E	330	6.3	105	198	8	15	3	5200	3600	2300
TCME477M006#0007	E	470	6.3	105	296	10	7	3	7700	5400	3500
TCME477M006#0010	E	470	6.3	105	296	10	10	3	6400	4500	2900
TCME687M006#0012	E	680	6.3	105	408	8	12	3	5800	4100	2600
10 Volt @ 85°C											
TCME337M010#0010	E	330	10	105	330	8	10	3	6400	4500	2900
TCME337M010#0015	E	330	10	105	330	8	15	3	5200	3600	2300
35 Volt @ 85°C											
TCME226M035#0025	E	22	35	105	77	8	25	3	4000	2800	1800
100 Volt @ 85°C											
TCMV106M100#0050	V	10	100	105	100	8	50	3	2900	2000	1300

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 2.2 volts. DCL is measured at rated voltage after 5 minutes.

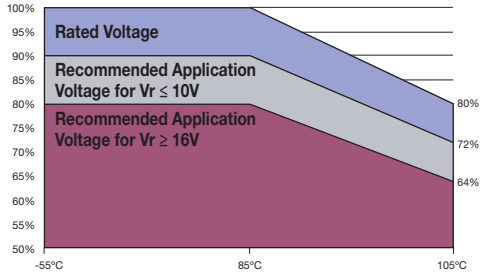
ESR allowed to move up to 1.25 times catalog limit post mounting.

For typical weight and composition see page 223.

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

RECOMMENDED DERATING FACTOR

Voltage and temperature derating as percentage of Vr



PRODUCT CATEGORY 105°C

<table>
<tr><th>TEST</th><th>Condition</th><th colspan="8">Characteristics</th></tr>
<tr><td rowspan="5">Endurance</td><td rowspan="5">Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine after application of 105°C temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.</td><td colspan="2">Visual examination</td><td colspan="6">no visible damage</td></tr>
<tr><td colspan="2">DCL</td><td colspan="6">1.25 x initial limit</td></tr>
<tr><td colspan="2">ΔC/C</td><td colspan="6">within ±20% of initial value</td></tr>
<tr><td colspan="2">DF</td><td colspan="6">1.5 x initial limit</td></tr>
<tr><td colspan="2">ESR</td><td colspan="6">2 x initial limit</td></tr>
<tr><td rowspan="6">Storage Life</td><td rowspan="6">105°C, 0V, 2000h</td><td colspan="2">Visual examination</td><td colspan="6">no visible damage</td></tr>
<tr><td colspan="2">DCL ($V_R \leq 75V$)</td><td colspan="6">1.25 x initial limit</td></tr>
<tr><td colspan="2">DCL ($V_R > 75V$)</td><td colspan="6">2 x initial limit</td></tr>
<tr><td colspan="2">ΔC/C</td><td colspan="6">within ±20% of initial value</td></tr>
<tr><td colspan="2">DF</td><td colspan="6">1.5 x initial limit</td></tr>
<tr><td colspan="2">ESR</td><td colspan="6">2 x initial limit</td></tr>
<tr><td rowspan="6">Humidity</td><td rowspan="6">Determine after storage without applied voltage at 65±2°C and 95±2% relative humidity for 500 hours and then recovery 1-2 hours at room temperature.</td><td colspan="2">Visual examination</td><td colspan="6">no visible damage</td></tr>
<tr><td colspan="2">DCL</td><td colspan="6">3 x initial limit</td></tr>
<tr><td colspan="2">ΔC/C</td><td colspan="6">within +30/-20% of initial value</td></tr>
<tr><td colspan="2">DF</td><td colspan="6">1.5 x initial limit</td></tr>
<tr><td colspan="2">ESR</td><td colspan="6">2 x initial limit</td></tr>
<tr><td rowspan="7">Temperature Stability</td><td colspan="3" rowspan="7">
<table>
<tr><th>Step</th><th>Temperature°C</th><th>Duration(min)</th></tr>
<tr><td>1</td><td>+20±2</td><td>15</td></tr>
<tr><td>2</td><td>-55+0/-3</td><td>15</td></tr>
<tr><td>3</td><td>+20±2</td><td>15</td></tr>
<tr><td>4</td><td>+85+3/-0</td><td>15</td></tr>
<tr><td>5</td><td>+105+3/-0</td><td>15</td></tr>
<tr><td>6</td><td>+20±2</td><td>15</td></tr>
</table>
</td><td></td><td>+20°C</td><td>-55°C</td><td>+20°C</td><td>+85°C</td><td>+105°C</td><td>+20°C</td></tr>
<tr><td>DCL</td><td>IL*</td><td>n/a</td><td>IL*</td><td>10 x IL*</td><td>12.5 x IL*</td><td>IL*</td></tr>
<tr><td>ΔC/C</td><td>n/a</td><td>+0/-20%</td><td>±10%</td><td>+20/-0%</td><td>+30/-0%</td><td>±10%</td></tr>
<tr><td>DF</td><td>IL*</td><td>1.5 x IL*</td><td>IL*</td><td>1.5 x IL*</td><td>2 x IL*</td><td>IL*</td></tr>
<tr><td rowspan="4">Surge Voltage</td><td colspan="3" rowspan="4">Test temperature: 105°C+3/0°C
Test voltage: Category voltage at 105°C
Surge voltage: 1.3 x category voltage at 105°C
Series protection resistance 1000±100Ω
Discharge resistance: 1000Ω
Number of cycles: 1000x
Cycle duration: 6 min; 30 sec charge,
5 min 30 sec discharge</td><td colspan="2">Visual examination</td><td colspan="6">no visible damage</td></tr>
<tr><td colspan="2">DCL</td><td colspan="6">initial limit</td></tr>
<tr><td colspan="2">ΔC/C</td><td colspan="6">within +10/-20% of initial value for Vr ≤ 10V
within +20/-30% of initial value for Vr ≥ 16V</td></tr>
<tr><td colspan="2">DF</td><td colspan="6">1.25 x initial limit</td></tr>
</table>

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