

TRM Professional Multianode



Tantalum Ultra Low ESR Capacitor



FEATURES

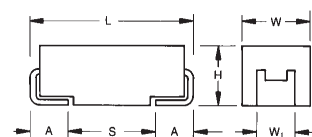
- Improved reliability – 0.5%/1khrs (twice better than standard)
- DCL reduced by 25% to 0.0075 CV
- Robust against higher thermo-mechanical stresses during assembly process
- Multi-anode construction
- Super low ESR
- CV range 4.7-1500µF / 2.5-50V
- “Mirror” construction used with D case capacitors reduces ESL to half
- Automotive, medical, aerospace, military and other hi-end application



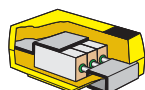
SnPb termination option is not
RoHS compliant.

APPLICATIONS

- Automotive, Avionics and Industrial high power DC/DC convertors



MULTIANODE CONSTRUCTION

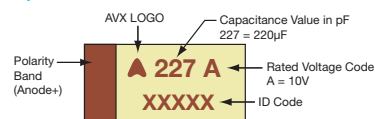


MULTIANODE TRMD LOW SELF INDUCTANCE CONSTRUCTION “MIRROR” DESIGN



MARKING

D, E 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.
D	2917	7343-31	7.30 (0.287)	4.30 (0.169)	2.90 (0.114)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
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)

W₁ dimension applies to the termination width for A dimensional area only.

HOW TO ORDER

TRM

Type

E

Case Size
See table above

108

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

*

Tolerance
K=±10%
M=±20%

004

Rated DC Voltage
002 = 2.5Vdc
004 = 4Vdc
006 = 6.3Vdc
010 = 10Vdc
012 = 12Vdc
016 = 16Vdc
020 = 20Vdc
025 = 25Vdc
035 = 35Vdc
050 = 50Vdc

R

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)
H, K = Non RoHS

0023

ESR in mΩ

TECHNICAL SPECIFICATIONS

Technical Data:

All technical data relate to an ambient temperature of +25°C

Capacitance Range:

4.7 µF to 1500 µF

Capacitance Tolerance:

±10%; ±20%

Rated Voltage (V _R)	≤ +85°C:	2.5	4	6.3	10	12	16	20	25	35	50
Category Voltage (V _C)	≤ +125°C:	1.7	2.7	4	7	8	10	13	17	23	33
Surge Voltage (V _S)	≤ +85°C:	3.3	5.2	8	13	16	20	26	32	46	65
Surge Voltage (V _S)	≤ +125°C:	2.2	3.4	5	8	10	13	16	20	28	40

Temperature Range:

-55°C to +125°C

Reliability:

0.5% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance, 60% confidence level

Meets requirements of AEC-Q200



CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) to 85°C									
μ F	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	12V (B)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
4.7	475										D(200)
6.8	685										
10	106									D(120)	E(150)*
15	156										
22	226									D(70)/E(60,100)	
33	336								D(65)	E(50,65)	
47	476						D(100)	D(55)	E(65)		
68	686										
100	107						D(55)*	E(35,45)			
150	157				D(45)		E(30,40)				
220	227				D(35)	E(35)					
330	337		D(35)	D(35)	E(35)						
470	477		D(35)	E(30)							
680	687		E(23)								
1000	108	D(25)	E(23)								
1500	158	E(18)									
2200	228										

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

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)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @ 100kHz	MSL	100kHz RMS Current (A)			
											25°C	85°C	125°C	
2.5 Volt @ 85°C														
TRMD108*002#0025	D	1000	2.5	85	1.7	125	18.8	8	25	3	3.194	2.874	1.277	
TRME158*002#0018	E	1500	2.5	85	1.7	125	28.1	6	18	3	3.873	3.486	1.549	
4 Volt @ 85°C														
TRMD337*004#0035	D	330	4	85	2.7	125	9.9	8	35	3	2.699	2.429	1.080	
TRMD477*004#0035	D	470	4	85	2.7	125	14.1	8	35	3	2.699	2.429	1.080	
TRME687*004#0023	E	680	4	85	2.7	125	20.4	6	23	3	3.426	3.084	1.370	
TRME108*004#0023	E	1000	4	85	2.7	125	30	6	23	3	3.426	3.084	1.370	
6.3 Volt @ 85°C														
TRMD337*006#0035	D	330	6.3	85	4	125	14.9	8	35	3	2.699	2.429	1.080	
TRME477*006#0030	E	470	6.3	85	4	125	21.2	6	30	3	3.000	2.700	1.200	
10 Volt @ 85°C														
TRMD157*010#0045	D	150	10	85	7	125	11.3	8	45	3	2.380	2.142	0.952	
TRMD227*010#0035	D	220	10	85	7	125	16.5	8	35	3	2.699	2.429	1.080	
TRME337*010#0035	E	330	10	85	7	125	24.8	6	35	3	2.777	2.500	1.111	
12 Volt @ 85°C														
TRME227*012#0035	E	220	12	85	8.4	125	19.8	6	35	3	2.777	2.500	1.111	
16 Volt @ 85°C														
TRMD476*016#0100	D	47	16	85	10	125	5.6	8	100	3	1.597	1.437	0.639	
TRME157*016#0030	E	150	16	85	10	125	18	6	30	3	3.000	2.700	1.200	
TRME157*016#0040	E	150	16	85	10	125	18	6	40	3	2.598	2.338	1.039	
20 Volt @ 85°C														
TRMD476*020#0055	D	47	20	85	13	125	7.1	8	55	3	2.153	1.938	0.861	
TRME107*020#0035	E	100	20	85	13	125	15	6	35	3	2.777	2.500	1.111	
TRME107*020#0045	E	100	20	85	13	125	15	6	45	3	2.449	2.205	0.980	
25 Volt @ 85°C														
TRMD336*025#0065	D	33	25	85	17	125	6.2	8	65	3	1.981	1.783	0.792	
TRME476*025#0065	E	47	25	85	17	125	8.8	6	65	3	2.038	1.834	0.815	
35 Volt @ 85°C														
TRMD106*035#0120	D	10	35	85	23	125	2.6	8	120	3	1.458	1.312	0.583	
TRMD226*035#0070	D	22	35	85	23	125	5.8	8	70	3	1.909	1.718	0.763	
TRME226*035#0060	E	22	35	85	23	125	5.8	6	60	3	2.121	1.909	0.849	
TRME226*035#0100	E	22	35	85	23	125	5.8	6	100	3	1.643	1.479	0.657	
TRME336*035#0050	E	33	35	85	23	125	8.7	6	50	3	2.324	2.091	0.930	
TRME336*035#0065	E	33	35	85	23	125	8.7	6	65	3	2.038	1.834	0.815	
50 Volt @ 85°C														
TRMD475*050#0200	D	4,7	50	85	33	125	1.8	8	200	3	1.129	1.016	0.452	

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, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalogue limit post mounting.

For typical weight and composition see page 202.

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.

QUALIFICATION TABLE

TEST	TRM professional multianode series (Temperature range -55°C to +125°C)									
	Condition			Characteristics						
Endurance	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 of 125°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.			Visual examination	no visible damage					
				DCL	initial limit					
				ΔC/C	within ±10% of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
Storage Life	125°C, 0V, 2000h			Visual examination	no visible damage					
				DCL	1.25 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					
Humidity	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.			Visual examination	no visible damage					
				DCL	1.5 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
Biased Humidity	Determine after leaving for 1000 hours at 85±2°C, 85% relative humidity and rated voltage and then recovery 1-2 hours at room temperature.			Visual examination	no visible damage					
				DCL	2 x initial limit					
				ΔC/C	within ±10% of initial value					
				DF	1.2 x initial limit					
				ESR	1.25 x initial limit					
Temperature Stability	Step	Temperature°C	Duration(min)		+20°C	-55°C	+20°C	+85°C	+125°C	+20°C
	1	+20±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*
	2	-55+0/-3	15	ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+12/-0%	±5%
	3	+20±2	15	DF	IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	4	+85+3/-0	15							
	5	+125+3/-0	15							
Surge Voltage	Test temperature: 125°C±3/0°C Test voltage: Category voltage at 125°C Surge voltage: 1.3 x category voltage at 125°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			Visual examination	no visible damage					
				DCL	initial limit					
				ΔC/C	within ±5% of initial value					
				DF	initial limit					
				ESR	1.25 x initial limit					

*Initial Limit