

# TRM Professional Multianode



## Tantalum Ultra Low ESR Capacitor

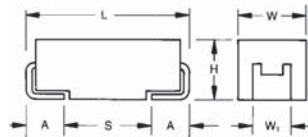


### FEATURES

- 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 4.7-1500 $\mu$ F / 2.5-50V
- “Mirror” construction used with D case capacitors reduces ESL to half
- Automotive, medical, aerospace, military and other hi-end application



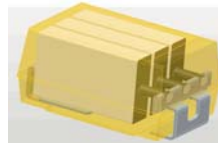
SnPb termination option is not  
RoHS compliant.



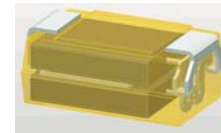
### APPLICATIONS

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

#### MULTIANODE CONSTRUCTION

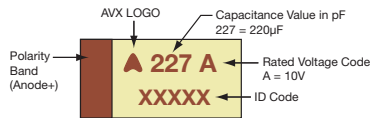


#### MULTIANODE TRM D LOW SELF INDUCTANCE CONSTRUCTION “MIRROR” DESIGN



### MARKING

#### D, E CASE



### CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L $\pm$ 0.20 (0.008)	W $\pm$ 0.20 (0.008) -0.10 (0.004)	H $\pm$ 0.20 (0.008) -0.10 (0.004)	W $\pm$ 0.20 (0.008)	A $\pm$ 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)

W<sub>1</sub> dimension applies to the termination width for A dimensional area only.

### HOW TO ORDER

<b>TRM</b>	<b>E</b>	<b>108</b>	<b>*</b>	<b>004</b>	<b>R</b>	<b>0023</b>
<b>Type</b>	<b>Case Size</b> See table above	<b>Capacitance Code</b> pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	<b>Tolerance</b> K=±10% M=±20%	<b>Rated DC Voltage</b> 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 012 = 12Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	<b>Packaging</b> 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	<b>ESR in m<math>\Omega</math></b>

### TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C										
Capacitance Range:	4.7 $\mu$ F to 1500 $\mu$ F										
Capacitance Tolerance:	±10%; ±20%										
Rated Voltage (V <sub>R</sub> )	≤ +85°C:	2.5	4	6.3	10	12	16	20	25	35	50
Category Voltage (V <sub>C</sub> )	≤ +125°C:	1.7	2.7	4	7	8	10	13	17	23	33
Surge Voltage (V <sub>S</sub> )	≤ +85°C:	3.3	5.2	8	13	16	20	26	32	46	65
Surge Voltage (V <sub>S</sub> )	≤ +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 <sub>R</sub> with 0.1 $\Omega$ /V series impedance, 60% confidence level										
	Meets requirements of AEC-Q200										

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## Tantalum Ultra Low ESR Capacitor

### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC ( $V_R$ ) to 85°C									
$\mu$ 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										

Released ratings, (ESR ratings in mOhms in parenthesis)

Engineering samples - please contact AVX

\*Ratings 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.

# TRM Professional Multianode



## Tantalum Ultra Low ESR Capacitor

### RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (µF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (µA)	DF Max. (%)	ESR Max. @ 100kHz (mΩ)	MSL	100kHz RMS Current (A)		
											25°C	85°C	125°C
<b>2.5 Volt @ 85°C</b>													
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
<b>4 Volt @ 85°C</b>													
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
<b>6.3 Volt @ 85°C</b>													
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
<b>10 Volt @ 85°C</b>													
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
<b>12 Volt @ 85°C</b>													
TRME227*012#0035	E	220	12	85	8.4	125	19.8	6	35	3	2.777	2.500	1.111
<b>16 Volt @ 85°C</b>													
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
<b>20 Volt @ 85°C</b>													
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
<b>25 Volt @ 85°C</b>													
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
<b>35 Volt @ 85°C</b>													
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
<b>50 Volt @ 85°C</b>													
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 222.

**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.**

# TRM Professional Multianode



## Tantalum Ultra Low ESR Capacitor

### QUALIFICATION TABLE

TEST	TRM professional multianode series (Temperature range -55°C to +125°C)										
	Condition			Characteristics							
<b>Endurance</b>	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						
<b>Storage Life</b>	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						
<b>Humidity</b>	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						
<b>Biased Humidity</b>	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						
<b>Temperature Stability</b>	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	ESR	1.25 x IL*	2.5 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	1.25 x IL*	
	5	+125+3/-0	15								
	6	+20±2	15								
<b>Surge Voltage</b>	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						
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Condition F			Visual examination	no visible damage						
				DCL	initial limit						
				ΔC/C	within ±5% of initial value						
				DF	initial limit						
				ESR	1.25 x initial limit						
<b>Vibration</b>	MIL-STD-202, Method 204, Condition D			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