TPM Multianode

Tantalum Ultra Low ESR Capacitor

FEATURES

- Multi-anode construction
- Super low ESR
- CV range: 10-2200µF / 2.5-50V
- 4 case sizes available
- "Mirror" multi-anode construction used with D, Y case capacitors reduces ESL to half

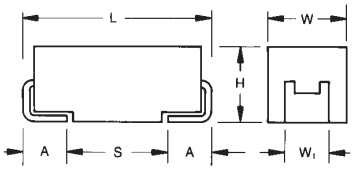
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

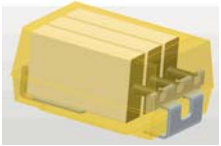
SnPb termination option is not RoHS compliant.

APPLICATIONS

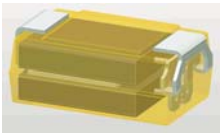
- High power DC/DC general applications



MULTIANODE CONSTRUCTION

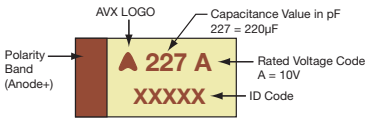


MULTIANODE TPM D, Y LOW SELF INDUCTANCE CONSTRUCTION "MIRROR" DESIGN



MARKING

D, E, V, Y 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)
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)
Y	2917	7343-20	7.30 (0.287)	4.30 (0.169)	2.00 (0.079) max	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

TPM	E	108	M	004	R	0018
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** K=±10% M=±20%	**Rated DC Voltage** 002=2.5Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc	**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	**ESR in mΩ**

TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C									
Capacitance Range:	10 µF to 2200 µF									
Capacitance Tolerance:	±10%, ±20%									
Rated Voltage (V_R)	≤ +85°C:	2.5	4	6.3	10	16	20	25	35	50
Category Voltage (V_C)	≤ +125°C:	1.7	2.7	4	7	10	13	17	23	33
Surge Voltage (V_S)	≤ +85°C:	3.3	5.2	8	13	20	26	32	46	65
Surge Voltage (V_S)	≤ +125°C:	2.2	3.4	5	8	13	16	20	28	40
Temperature Range:	-55°C to +125°C									
Reliability:	1% per 1000 hours at 85°C, V_R with 0.1Ω/V series impedance, 60% confidence level									

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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)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
6.8	685									
10	106									D(140) E(120)
15	156									E(75,100)
22	226								D(70) E(60,100)	E(75,100)
33	336							D(65)	E(50,65)	
47	476					D(100)	D(45,55)	D(55)/E(65)	E(55,65)	
68	686					D(40,50)		E(45,55)		
100	107				Y(45)(M)	D(40,50)	E(35,45)			
150	157				Y(45)(M)	E(30,40)	E(35)			
220	227			Y(30)(M)	D(35)	E(25,40)				
330	337		D(25,35)	D(25,35)	D(35) E(23,35)	E(50)*				
470	477		D(25,35)	D(30) E(18,23,30)	E(23,30)					
680	687		D(25) E(18,23)	E(18,23) V(23)						
1000	108	D(25)	D(25,45) E(18,23), V(18)	E(25)(M) V(20)(M)						
1500	158	E(12,15,18)	E(15,18)							
2200	228	E(18)(M)								

Released ratings (M tolerance only), (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.

TPM 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
2.5 Volt @ 85°C													
TPMD108*002#0025	D	1000	2.5	85	1.7	125	25	8	25	3	3.194	2.874	1.277
TPME158*002#0012	E	1500	2.5	85	1.7	125	38	6	12	3	4.743	4.269	1.897
TPME158*002#0015	E	1500	2.5	85	1.7	125	38	6	15	3	4.243	3.818	1.697
TPME158*002#0018	E	1500	2.5	85	1.7	125	38	6	18	3	3.873	3.486	1.549
TPME228M002#0018	E	2200	2.5	85	1.7	125	44	10	18	3	3.873	3.486	1.549
4 Volt @ 85°C													
TPMD337*004#0025	D	330	4	85	2.7	125	13.2	8	25	3	3.194	2.874	1.277
TPMD337*004#0035	D	330	4	85	2.7	125	13.2	8	35	3	2.699	2.429	1.080
TPMD477*004#0025	D	470	4	85	2.7	125	18.8	8	25	3	3.194	2.874	1.277
TPMD477*004#0035	D	470	4	85	2.7	125	18.8	8	35	3	2.699	2.429	1.080
TPMD687*004#0025	D	680	4	85	2.7	125	27.2	8	25	3	3.194	2.874	1.277
TPME687*004#0018	E	680	4	85	2.7	125	27	6	18	3	3.873	3.486	1.549
TPME687*004#0023	E	680	4	85	2.7	125	27	6	23	3	3.426	3.084	1.370
TPMD108*004#0025	D	1000	4	85	2.7	125	40	8	25	3	3.194	2.874	1.277
TPMD108*004#0045	D	1000	4	85	2.7	125	40	8	45	3	2.380	2.142	0.952
TPME108*004#0018	E	1000	4	85	2.7	125	40	6	18	3	3.873	3.486	1.549
TPME108*004#0023	E	1000	4	85	2.7	125	40	6	23	3	3.426	3.084	1.370
TPMV108*004#0018	V	1000	4	85	2.7	125	40	6	18	3	3.979	3.581	1.592
TPME158*004#0015	E	1500	4	85	2.7	125	40	6	15	3	4.243	3.818	1.697
TPME158*004#0018	E	1500	4	85	2.7	125	40	6	18	3	3.873	3.486	1.549
6.3 Volt @ 85°C													
TPMY227M006#0030	Y	220	6.3	85	4	125	13.2	6	30	3	2.646	2.381	1.058
TPMD337*006#0025	D	330	6.3	85	4	125	19.8	8	25	3	3.194	2.874	1.277
TPMD337*006#0035	D	330	6.3	85	4	125	19.8	8	35	3	2.699	2.429	1.080
TPMD477*006#0030	D	470	6.3	85	4	125	28.2	8	30	3	2.915	2.624	1.166
TPME477*006#0018	E	470	6.3	85	4	125	28	6	18	3	3.873	3.486	1.549
TPME477*006#0023	E	470	6.3	85	4	125	28	6	23	3	3.426	3.084	1.370
TPME477*006#0030	E	470	6.3	85	4	125	28	6	30	3	3.000	2.700	1.200
TPME687*006#0018	E	680	6.3	85	4	125	41	6	18	3	3.873	3.486	1.549
TPME687*006#0023	E	680	6.3	85	4	125	41	6	23	3	3.426	3.084	1.370
TPMV687*006#0023	V	680	6.3	85	4	125	41	6	23	3	3.520	3.168	1.408
TPME108M006#0025	E	1000	6.3	85	4	125	63	8	25	3	3.286	2.958	1.315
TPMV108M006#0020	V	1000	6.3	85	4	125	63	8	20	3	3.775	3.397	1.510
10 Volt @ 85°C													
TPMY107M010#0045	Y	100	10	85	7	125	10	8	45	3	2.160	1.944	0.864
TPMY157M010#0045	Y	150	10	85	7	125	15	8	45	3	2.160	1.944	0.864
TPMD227*010#0035	D	220	10	85	7	125	22	8	35	3	2.699	2.429	1.080
TPMD337*010#0035	D	330	10	85	7	125	33	8	35	3	2.699	2.429	1.080
TPME337*010#0023	E	330	10	85	7	125	33	6	23	3	3.426	3.084	1.370
TPME337*010#0035	E	330	10	85	7	125	33	6	35	3	2.777	2.500	1.111
TPME477*010#0023	E	470	10	85	7	125	47	6	23	3	3.426	3.084	1.370
TPME477*010#0030	E	470	10	85	7	125	47	6	30	3	3.000	2.700	1.200
16 Volt @ 85°C													
TPMD476*016#0100	D	47	16	85	10	125	7.5	8	100	3	1.597	1.437	0.639
TPMD686*016#0040	D	68	16	85	10	125	10.9	8	40	3	2.525	2.272	1.010
TPMD686*016#0050	D	68	16	85	10	125	10.9	8	50	3	2.258	2.032	0.903
TPMD107*016#0040	D	100	16	85	10	125	16	8	40	3	2.525	2.272	1.010
TPMD107*016#0050	D	100	16	85	10	125	16	8	50	3	2.258	2.032	0.903
TPME157*016#0030	E	150	16	85	10	125	24	6	30	3	3.000	2.700	1.200
TPME157*016#0040	E	150	16	85	10	125	24	6	40	3	2.598	2.338	1.039
TPME227*016#0025	E	220	16	85	10	125	35	6	25	3	3.286	2.958	1.315
TPME227*016#0040	E	220	16	85	10	125	35	6	40	3	2.598	2.338	1.039
20 Volt @ 85°C													
TPMD476*020#0045	D	47	20	85	13	125	9.4	8	45	3	2.380	2.142	0.952
TPMD476*020#0055	D	47	20	85	13	125	9.4	8	55	3	2.153	1.938	0.861
TPME107*020#0035	E	100	20	85	13	125	20	6	35	3	2.777	2.500	1.111
TPME107*020#0045	E	100	20	85	13	125	20	6	45	3	2.449	2.205	0.980
TPME157*020#0035	E	150	20	85	13	125	30	10	35	3	2.777	2.500	1.111
25 Volt @ 85°C													
TPMD336*025#0065	D	33	25	85	17	125	8.3	8	65	3	1.981	1.783	0.792
TPMD476*025#0055	D	47	25	85	17	125	11.8	8	55	3	2.153	1.938	0.861
TPME476*025#0065	E	47	25	85	17	125	11.8	6	65	3	2.038	1.834	0.815
TPME686*025#0045	E	68	25	85	17	125	17	6	45	3	2.449	2.205	0.980
TPME686*025#0055	E	68	25	85	17	125	17	6	55	3	2.216	1.994	0.886
35 Volt @ 85°C													
TPMD226*035#0070	D	22	35	85	23	125	7.7	8	70	3	1.909	1.718	0.763
TPME226*035#0060	E	22	35	85	23	125	8	6	60	3	2.121	1.909	0.849
TPME226*035#0100	E	22	35	85	23	125	8	6	100	3	1.643	1.479	0.657
TPME336*035#0050	E	33	35	85	23	125	12	6	50	3	2.324	2.091	0.930
TPME336*035#0065	E	33	35	85	23	125	12	6	65	3	2.038	1.834	0.815

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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
TPME476*035#0055	E	47	35	85	23	125	16	6	55	3	2.216	1.994	0.886
TPME476*035#0065	E	47	35	85	23	125	16	6	65	3	2.038	1.834	0.815
50 Volt @ 85°C													
TPMD106*050#0140	D	10	50	85	33	125	5	8	140	3	1.350	1.215	0.540
TPME106*050#0120	E	10	50	85	33	125	5	6	120	3	1.500	1.350	0.600
TPME156*050#0075	E	15	50	85	33	125	7.5	6	75	3	1.897	1.708	0.759
TPME156*050#0100	E	15	50	85	33	125	7.5	6	100	3	1.643	1.479	0.657
TPME226*050#0075	E	22	50	85	33	125	11	8	75	3	1.897	1.708	0.759
TPME226*050#0100	E	22	50	85	33	125	11	8	100	3	1.643	1.479	0.657

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 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.

QUALIFICATION TABLE

TEST	TPM 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					
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					
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	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							
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