

TPM Multianode



Tantalum Ultra Low ESR Capacitor



FEATURES

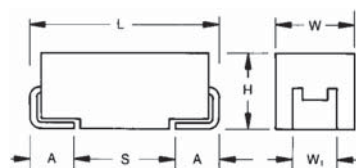
- Multi-anode construction
- Super low ESR
- CV range: 10-2200 μ F / 2.5-50V
- 4 case sizes available
- "Mirror" multi-anode construction used with D, Y case capacitors reduces ESL to half

APPLICATIONS

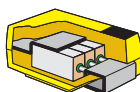
- High power DC/DC general applications



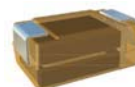
SnPb termination option is not RoHS compliant.



MULTIANODE CONSTRUCTION

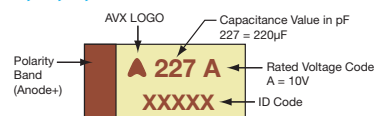


MULTIANODE TPM D, Y LOW SELF INDUCTANCE CONSTRUCTION "MIRROR" DESIGN



MARKING

D, E, V, Y CASE



CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L $\pm$ 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)
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

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)

M

Tolerance
K=±10%
M=±20%

004

Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
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

0018

ESR in m Ω

TECHNICAL SPECIFICATIONS

Technical Data:

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

Capacitance Range: 10 μ F to 2200 μ F

Capacitance Tolerance: ±10%, ±20%

Rated Voltage (V_R)	$\leq +85^\circ\text{C}$:	2.5	4	6.3	10	16	20	25	35	50	
Category Voltage (V_C)	$\leq +125^\circ\text{C}$:	1.7	2.7	4	7	10	13	17	23	33	
Surge Voltage (V_S)	$\leq +85^\circ\text{C}$:	3.3	5.2	8	13	20	26	32	46	65	
Surge Voltage (V_S)	$\leq +125^\circ\text{C}$:	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 0.1 Ω /V series impedance, 60% confidence level



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 codes ^(M tolerance only)

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.

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 (µA) Max.	DF % Max.	ESR Max. (mΩ) @ 100kHz	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	
TPME337*016#0050	E	330	16	85	10	125	52.8	10	50	3	2.324	2.091	0.930	
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	



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
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 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	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							
	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