

TPM Multianode

Tantalum Ultra Low ESR Capacitor



FEATURES

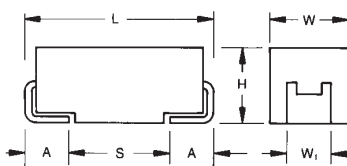
- Multi-anode construction
- Super low ESR
- CV range: 10-2200 μ F / 2.5-50V
- 4 case sizes available
- "Mirror" multi-anode construction used with D, Y case capacitors reduces ESL to half



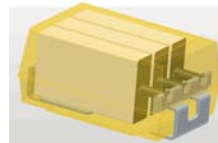
SnPb termination option is not RoHS compliant.

APPLICATIONS

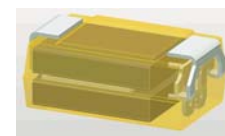
- High power DC/DC general applications



MULTIANODE CONSTRUCTION

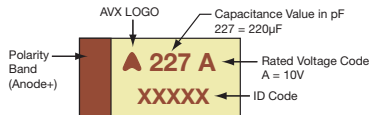


MULTIANODE TPM D, Y LOW SELF INDUCTANCE CONSTRUCTION "MIRROR" DESIGN



MARKING

D, E, V, Y CASE



CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L $\pm$ 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 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

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
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							
	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

Mouser Electronics

Authorized Distributor

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AVX:

TPME157K016R0040	TPME107K020R0035	TPME337M010R0035	TPME476K035R0055	TPME477M006R0030
TPME107M020R0035	TPME686M025R0055	TPME337M010H0035	TPME226M035R0060	TPME336M035R0050
TPME477M006R0018	TPME477K006R0018	TPME107K020H0035	TPME157K016H0040	TPME107M020H0035
TPME477K006H0030	TPME476K035H0055	TPME477M006H0030	TPME107K020H0045	TPME477K006R0030
TPME108K004R0018	TPME108M004R0018	TPME687K006R0023	TPME106M050S0120	TPME477K006S0030
TPME686M025S0055	TPME108K004H0023	TPME228M002R0018	TPME477M010H0023	TPME337K010H0035-X
TPME686K025H0055-X	TPME687K004H0023-X	TPMD227K010R0035	TPMD227M010R0035	TPMD337K006R0025
TPMD337K006R0035	TPMD337M006R0025	TPMD337M006R0035	TPMD687K004R0025	TPMD687M004R0025
TPMD108K002R0025	TPMD108M002R0025	TPMD337K004R0025	TPMD337K004R0035	TPMD337K010R0035
TPMD337M004R0025	TPMD337M004R0035	TPMD337M010R0035	TPMD477K004R0025	TPMD477K004R0035
TPMD477K006R0030	TPMD477M004R0025	TPMD477M004R0035	TPMD477M006R0030	TPME106K050R0120
TPME158K002R0015	TPME226K035R0060	TPME227K016R0025	TPME227K016R0040	TPME227M016R0025
TPME227M016R0040	TPME336K035R0050	TPME337K010R0023	TPME337K010R0035	TPME476K035R0065
TPME476M035R0065	TPME477K006R0023	TPME477K010R0023	TPME477M010R0023	TPME477M010R0030
TPME686K025R0045	TPME686K025R0055	TPME686M025R0045	TPME687K004R0023	TPME687K006R0018
TPME687M004R0018	TPME687M004R0023	TPME687M006R0023	TPMD108K004R0025	TPME477K010H0023
TPME687K006H0023	TPME108M004H0018	TPME108K004H0018	TPME107K020R0045	TPME107M020R0045
TPME157M016R0040	TPME158M002R0015	TPME226M035R0100	TPME336M035R0065	TPME337K010S0035
TPME337M010R0023	TPME477M006R0023	TPMV108M004R0018	TPMV108M004S0018	TPMV687K006R0023
TPMV687M006R0023	TPME227K016H0025	TPME106M050H0120	TPME157K020H0035	TPME157M020H0035