

TPM Multianode



Tantalum Ultra Low ESR Capacitor



FEATURES

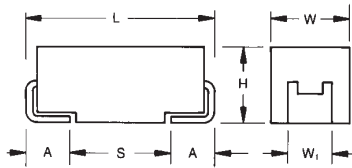
- Multi-anode construction
- Super low ESR
- CV range: 10-2200 μ F / 2.5-50V
- 5 case sizes available
- "Mirror" multi-anode construction used with D, Y case capacitors reduces ESL to half



SnPb termination option is not RoHS compliant.

APPLICATIONS

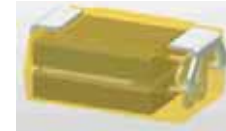
- High power DC/DC general applications



MULTIANODE CONSTRUCTION

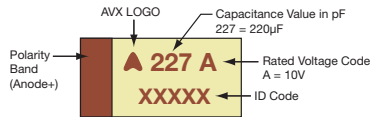


MULTIANODE TPM D, Y LOW SELF INDUCTANCE CONSTRUCTION "MIRROR" DESIGN



MARKING

D, E, U, 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 ₁ \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)
U	2924	7361-43	7.30 (0.287)	6.10 (0.240)	4.10 (0.162)	3.10 (0.120)	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.

Engineering samples

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= \pm 10%
M= \pm 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: \pm 10%, \pm 20%

Rated Voltage (V _R)	\leq +85°C:	2.5	4	6.3	10	16	20	25	35	50
Category Voltage (V _C)	\leq +125°C:	1.7	2.7	4	7	10	13	17	23	33
Surge Voltage (V _S)	\leq +85°C:	3.3	5.2	8	13	20	26	32	46	65
Surge Voltage (V _S)	\leq +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 0.1 Ω /V series impedance, 60% confidence level

TPM Multianode



Tantalum Ultra Low ESR Capacitor

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)	D(40,50)	E(45,55)		
100	107				Y(45) ^(M)	D(40,50)	E(35,45)	E(45,60)		
150	157				Y(45) ^(M)	E(30,40)	E(35)			
220	227			Y(30) ^(M)	D(35)	E(25,40) U(30,40)				
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) U(23,30)					
680	687		D(25) E(18,23)	E(18,23) U(18,23) V(23)						
1000	108	D(25)	D(25,45) E(18,23) U(18,23) V(18)	E(25) ^(M) V(20) ^(M)						
1500	158	E(12,15,18) U(18,23)	E(15,18)							
2200	228	E(18) ^(M)								

Released ratings ^(M tolerance only), (ESR ratings in mOhms in parentheses)

Engineering samples - please contact AVX

*Ratings under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher voltage 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)	100kHz RMS Current (A)			MSL
										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	3.194	2.874	1.277	3
TPME158*002#0012	E	1500	2.5	85	1.7	125	38	6	12	4.743	4.269	1.897	3
TPME158*002#0015	E	1500	2.5	85	1.7	125	38	6	15	4.243	3.818	1.697	3
TPME158*002#0018	E	1500	2.5	85	1.7	125	38	6	18	3.873	3.486	1.549	3
TPMU158*002#0018	U	1500	2.5	85	1.7	125	30	6	18	4.048	3.643	1.619	3
TPMU158*002#0023	U	1500	2.5	85	1.7	125	30	6	23	3.581	3.223	1.433	3
TPME228M002#0018	E	2200	2.5	85	1.7	125	44	10	18	3.873	3.486	1.549	3
4 Volt @ 85°C													
TPMD337*004#0025	D	330	4	85	2.7	125	13.2	8	25	3.194	2.874	1.277	3
TPMD337*004#0035	D	330	4	85	2.7	125	13.2	8	35	2.699	2.429	1.080	3
TPMD477*004#0025	D	470	4	85	2.7	125	18.8	8	25	3.194	2.874	1.277	3
TPMD477*004#0035	D	470	4	85	2.7	125	18.8	8	35	2.699	2.429	1.080	3
TPMD687*004#0025	D	680	4	85	2.7	125	27.2	8	25	3.194	2.874	1.277	3
TPME687*004#0018	E	680	4	85	2.7	125	27	6	18	3.873	3.486	1.549	3
TPME687*004#0023	E	680	4	85	2.7	125	27	6	23	3.426	3.084	1.370	3
TPMD108*004#0025	D	1000	4	85	2.7	125	40	8	25	3.194	2.874	1.277	3
TPMD108*004#0045	D	1000	4	85	2.7	125	40	8	45	2.380	2.142	0.952	3
TPME108*004#0018	E	1000	4	85	2.7	125	40	6	18	3.873	3.486	1.549	3
TPME108*004#0023	E	1000	4	85	2.7	125	40	6	23	3.426	3.084	1.370	3
TPMU108*004#0018	U	1000	4	85	2.7	125	40	6	18	4.048	3.643	1.619	3
TPMU108*004#0023	U	1000	4	85	2.7	125	40	6	23	3.581	3.223	1.433	3
TPMV108*004#0018	V	1000	4	85	2.7	125	40	6	18	3.979	3.581	1.592	3
TPME158*004#0015	E	1500	4	85	2.7	125	40	6	15	4.243	3.818	1.697	3
TPME158*004#0018	E	1500	4	85	2.7	125	40	6	18	3.873	3.486	1.549	3
6.3 Volt @ 85°C													
TPMY227M006#0030	Y	220	6.3	85	4	125	13.2	6	30	2.646	2.381	1.058	3
TPMD337*006#0025	D	330	6.3	85	4	125	19.8	8	25	3.194	2.874	1.277	3
TPMD337*006#0035	D	330	6.3	85	4	125	19.8	8	35	2.699	2.429	1.080	3
TPMD477*006#0030	D	470	6.3	85	4	125	28.2	8	30	2.915	2.624	1.166	3
TPME477*006#0018	E	470	6.3	85	4	125	28	6	18	3.873	3.486	1.549	3
TPME477*006#0023	E	470	6.3	85	4	125	28	6	23	3.426	3.084	1.370	3
TPME477*006#0030	E	470	6.3	85	4	125	28	6	30	3.000	2.700	1.200	3
TPME687*006#0018	E	680	6.3	85	4	125	41	6	18	3.873	3.486	1.549	3
TPME687*006#0023	E	680	6.3	85	4	125	41	6	23	3.426	3.084	1.370	3
TPMU687*006#0018	U	680	6.3	85	4	125	41	6	18	4.048	3.643	1.619	3
TPMU687*006#0023	U	680	6.3	85	4	125	41	6	23	3.581	3.223	1.433	3
TPMV687*006#0023	V	680	6.3	85	4	125	41	6	23	3.520	3.168	1.408	3
TPME108M006#0025	E	1000	6.3	85	4	125	63	8	25	3.286	2.958	1.315	3
TPMV108M006#0020	V	1000	6.3	85	4	125	63	8	20	3.775	3.397	1.510	3
10 Volt @ 85°C													
TPMY107M010#0045	Y	100	10	85	7	125	10	8	45	2.160	1.944	0.864	3
TPMY157M010#0045	Y	150	10	85	7	125	15	8	45	2.160	1.944	0.864	3
TPMD227*010#0035	D	220	10	85	7	125	22	8	35	2.699	2.429	1.080	3
TPMD337*010#0035	D	330	10	85	7	125	33	8	35	2.699	2.429	1.080	3
TPME337*010#0023	E	330	10	85	7	125	33	6	23	3.426	3.084	1.370	3
TPME337*010#0035	E	330	10	85	7	125	33	6	35	2.777	2.500	1.111	3
TPME477*010#0023	E	470	10	85	7	125	47	6	23	3.426	3.084	1.370	3
TPME477*010#0030	E	470	10	85	7	125	47	6	30	3.000	2.700	1.200	3
TPMU477*010#0023	U	470	10	85	7	125	47	8	23	3.581	3.223	1.433	3
TPMU477*010#0030	U	470	10	85	7	125	47	8	30	3.136	2.822	1.254	3
16 Volt @ 85°C													
TPMD476*016#0100	D	47	16	85	10	125	7.5	8	100	1.597	1.437	0.639	3
TPMD686*016#0040	D	68	16	85	10	125	10.9	8	40	2.525	2.272	1.010	3
TPMD686*016#0050	D	68	16	85	10	125	10.9	8	50	2.258	2.032	0.903	3
TPMD107*016#0040	D	100	16	85	10	125	16	8	40	2.525	2.272	1.010	3
TPMD107*016#0050	D	100	16	85	10	125	16	8	50	2.258	2.032	0.903	3
TPME157*016#0030	E	150	16	85	10	125	24	6	30	3.000	2.700	1.200	3
TPME157*016#0040	E	150	16	85	10	125	24	6	40	2.598	2.338	1.039	3
TPME227*016#0025	E	220	16	85	10	125	35	6	25	3.286	2.958	1.315	3
TPME227*016#0040	E	220	16	85	10	125	35	6	40	2.598	2.338	1.039	3
TPMU227*016#0030	U	220	16	85	10	125	35	8	30	3.136	2.822	1.254	3
TPMU227*016#0040	U	220	16	85	10	125	35	8	40	2.716	2.444	1.086	3
20 Volt @ 85°C													
TPMD476*020#0045	D	47	20	85	13	125	9.4	8	45	2.380	2.142	0.952	3
TPMD476*020#0055	D	47	20	85	13	125	9.4	8	55	2.153	1.938	0.861	3
TPME107*020#0035	E	100	20	85	13	125	20	6	35	2.777	2.500	1.111	3
TPME107*020#0045	E	100	20	85	13	125	20	6	45	2.449	2.205	0.980	3
TPME157*020#0035	E	150	20	85	13	125	30	10	35	2.777	2.500	1.111	3

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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)	100kHz RMS Current (A)			MSL
										25°C	85°C	125°C	
25 Volt @ 85°C													
TPMD336*025#0065	D	33	25	85	17	125	8.3	8	65	1.981	1.783	0.792	3
TPMD476*025#0055	D	47	25	85	17	125	11.8	8	55	2.153	1.938	0.861	3
TPME476*025#0065	E	47	25	85	17	125	11.8	6	65	2.038	1.834	0.815	3
TPME686*025#0045	E	68	25	85	17	125	17	6	45	2.449	2.205	0.980	3
TPME686*025#0055	E	68	25	85	17	125	17	6	55	2.216	1.994	0.886	3
TPME107*025#0045	E	100	25	85	17	125	25	14	45	2.449	2.205	0.980	3
TPME107*025#0060	E	100	25	85	17	125	25	14	60	2.121	1.909	0.849	3
35 Volt @ 85°C													
TPMD226*035#0070	D	22	35	85	23	125	7.7	8	70	1.909	1.718	0.763	3
TPME226*035#0060	E	22	35	85	23	125	8	6	60	2.121	1.909	0.849	3
TPME226*035#0100	E	22	35	85	23	125	8	6	100	1.643	1.479	0.657	3
TPME336*035#0050	E	33	35	85	23	125	12	6	50	2.324	2.091	0.930	3
TPME336*035#0065	E	33	35	85	23	125	12	6	65	2.038	1.834	0.815	3
TPME476*035#0055	E	47	35	85	23	125	16	6	55	2.216	1.994	0.886	3
TPME476*035#0065	E	47	35	85	23	125	16	6	65	2.038	1.834	0.815	3
50 Volt @ 85°C													
TPMD106*050#0140	D	10	50	85	33	125	5	8	140	1.350	1.215	0.540	3
TPME106*050#0120	E	10	50	85	33	125	5	6	120	1.500	1.350	0.600	3
TPME156*050#0075	E	15	50	85	33	125	7.5	6	75	1.897	1.708	0.759	3
TPME156*050#0100	E	15	50	85	33	125	7.5	6	100	1.643	1.479	0.657	3
TPME226*050#0075	E	22	50	85	33	125	11	8	75	1.897	1.708	0.759	3
TPME226*050#0100	E	22	50	85	33	125	11	8	100	1.643	1.479	0.657	3

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 257.

NOTE: AVX reserves the right to supply higher voltage ratings 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						

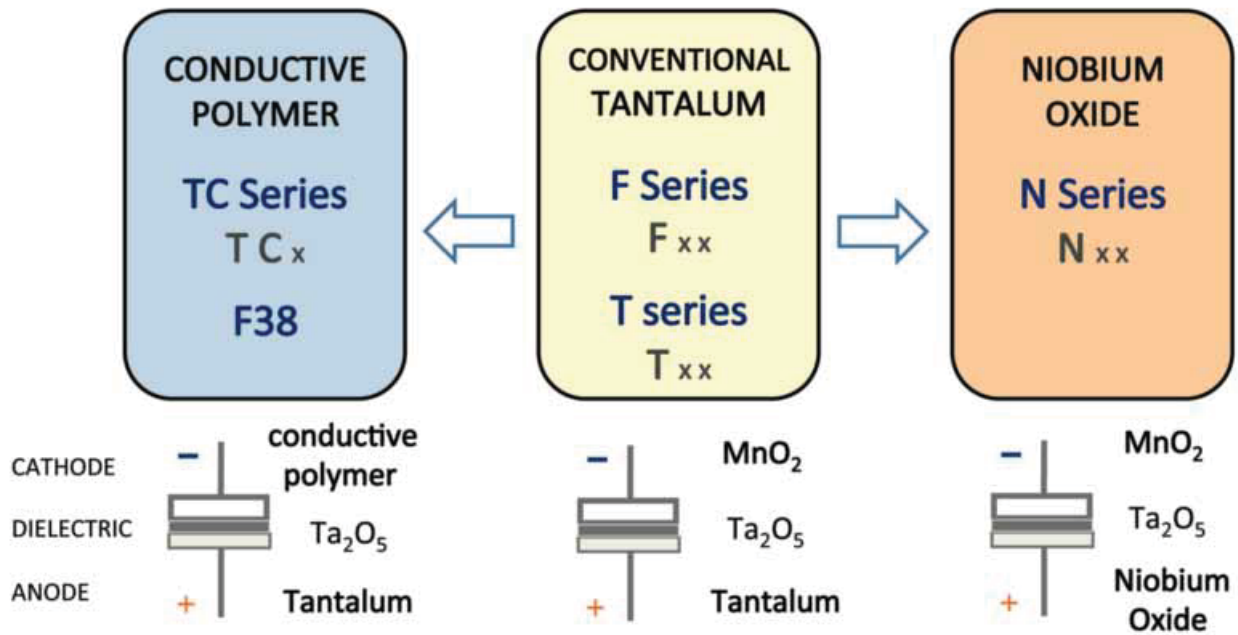
*Initial Limit

TPM Multianode

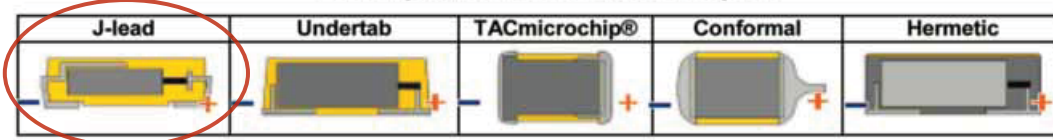


Tantalum Ultra Low ESR Capacitor

AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP



Five Capacitor Construction Styles



SERIES LINE UP: CONVENTIONAL SMD MnO₂

