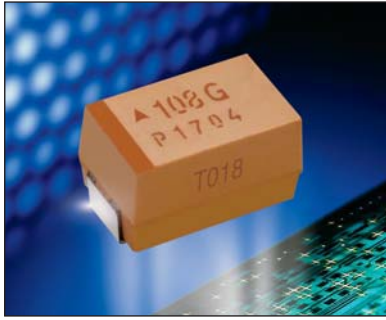


# TBM Multianode

## Tantalum Ultra Low ESR COTS-Plus



TBM COTS-Plus series uses an internal multi-anode design to achieve ultra-low ESR which improves performance in high ripple power applications.

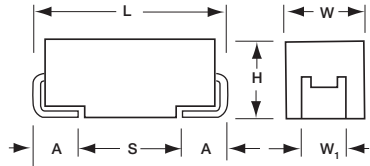
TBM is available with Weibull Grade “B” reliability and all MIL-PRF-55365 Rev. G surge test options (“A”, “B” & “C”).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these

correspond to “H”, “K”, “C” and “B” termination, respectively, per MIL-PRF-55365).

The molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of ASTM E-595.

For moisture sensitivity levels please refer to the High Reliability Tantalum MSL section located in the back of the High Reliability Tantalum Catalog.



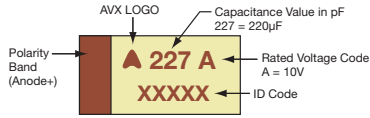
### CASE DIMENSIONS: millimeters (inches)

Code	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H+0.20 (0.008) -0.10 (0.004)	W <sub>1</sub> ±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
D	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	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	7.30 (0.287)	6.10 (0.240)	3.55 (0.140)	3.10 (0.120)	1.30 (0.051)	4.40 (0.173)

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

### MARKING

#### D, E, V CASE



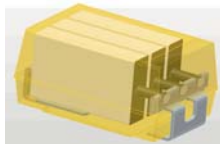
### CAPACITANCE AND RATED VOLTAGE RANGE LETTER DENOTES CASE SIZE ESR LIMIT IN BRACKETS

Capacitance		Rated Voltage DC (V <sub>R</sub> ) to 85°C								
µF	Code	2.5V (e)	4V (G)	6V (J)	10V (A)	12V (B)	16V (C)	20V (D)	25V (E)	35V (V)
22	226									D(70) E(60,100)
33	336								D(65)	E(50,65)
47	476								E(65)	E(55)
68	686								E(45)	
100	107							E(35,45)		
150	157						E(30,40)			
220	227				D(35)	E(35)	E(25)			
330	337		D(35)	D(35)	E(23,35)					
470	477		D(35)	E(18,30)	E(23)					
680	687		E(18,23)	E(18), V(23)						
1000	108	D(25)	E(18,23) V(18)							
1500	158	E(12,18)	E(15)							
2000	208									

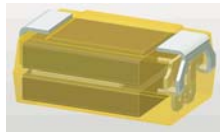
Available Ratings: ESR limits quoted in brackets (mOhms)

Notes: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards. EIA standards for Low ESR solid tantalum capacitors allow an ESR movement of 1.25 times initial limit post mounting.

#### MULTIANODE CONSTRUCTION



#### MULTIANODE TBM D LOW SELF INDUCTANCE CONSTRUCTION "MIRROR" DESIGN



### HOW TO ORDER

#### COTS-PLUS:

TBM	E	477	*	006	L	□	#	@	0	^	++
<b>Type</b>	<b>Case Size</b>	<b>Capacitance Code</b>	<b>Capacitance Tolerance</b>	<b>Voltage Code</b>	<b>Standard or Low ESR Range</b>	<b>Packaging</b>	<b>Inspection Level</b>	<b>Reliability Grade</b>	<b>Qualification Level</b>	<b>Termination Finish</b>	<b>Surge Test Option</b>
		pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	M = ±20% K = ±10%	002 = 2.5Vdc 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 012 = 12Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc	C = Std ESR L = Low ESR	B = Bulk R = 7" T&R S = 13" T&R W = Waffle  See page 8 for additional packaging options.	S = Std. Conformance L = Group A	Weibull: B = 0.1%/1000 hrs. 90% conf. Z = Non-ER	0 = N/A	H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn	00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull



### TECHNICAL SPECIFICATIONS

Technical Data: Unless otherwise specified, all technical data relate to an ambient temperature of +25°C

Capacitance Range:	22 µF to 1500 µF										
Capacitance Tolerance:	±10%; ±20%										
Rated Voltage DC (V <sub>R</sub> )	≤ +85°C:	2.5	4	6	10	12	16	20	25	35	
Category Voltage (V <sub>C</sub> )	≤ +125°C:	1.7	2.7	4	7	8.4	10	13	17	23	
Surge Voltage (V <sub>S</sub> )	≤ +85°C:	3.3	5.2	8	13	15.6	20	26	32	46	
Surge Voltage (V <sub>S</sub> )	≤ +125°C:	2.2	3.4	5	8	9.6	12	16	20	28	
Temperature Range:	-55°C to +125°C										

## Tantalum Ultra Low ESR COTS-Plus

RATING & PART NUMBER REFERENCE		Parametric Specifications by Rating						Typical RMS Ripple Data by Rating									
		Capacitance			ESR			DC Rated Voltage		DF max		Power Dissipation		Ripple Current		Ripple Voltage	
		Cap @ 120Hz	µF @ 25°C	V @ +85°C	DC Rated Voltage @ 100kHz	ESR @ +25°C	mOhms @ +25°C	+25°C	+85°C	+125°C	+25°C	+85°C	W	100kHz	125°C	100kHz	125°C
AVX P/N	Case						(µA)	(µA)	(µA)	(%)	(%)		A (100kHz)	A (100kHz)	V (100kHz)	V (100kHz)	
<b>2.5 Volt @ 85°C (1.7 Volt @ 125°C)</b>																	
TBMD108*002□□SB0^++	D	1000	18.8	25	376	188	8	11	12	0.255	3.194	2.874	1.277	0.080	0.072	0.032	
TBME158*002□□SB0^++	E	1500	28.1	18	562	281	6	9	10	0.270	3.873	3.486	1.549	0.070	0.063	0.028	
TBME158*002□□SB0^++	E	1500	38	12	380	760	6	9	10	0.270	4.743	4.269	1.897	0.057	0.051	0.023	
<b>4 Volt @ 85°C (2.7 Volt @ 125°C)</b>																	
TBMD337*004□□SB0^++	D	330	9.9	35	198	99	8	11	12	0.255	2.699	2.429	1.080	0.094	0.085	0.038	
TBMD477*004□□SB0^++	D	470	14.1	35	282	141	8	11	12	0.255	2.699	2.429	1.080	0.094	0.085	0.038	
TBME687*004□□SB0^++	E	680	20.4	23	408	204	6	9	10	0.270	3.426	3.084	1.370	0.079	0.071	0.032	
TBME687*004□□SB0^++	E	680	27	18	540	270	6	9	10	0.270	3.873	3.486	1.549	0.070	0.063	0.028	
TBME108*004□□SB0^++	E	1000	30	23	600	300	6	9	10	0.270	3.426	3.084	1.370	0.079	0.071	0.032	
TBME108*004□□SB0^++	E	1000	40	18	400	400	6	9	10	0.270	3.873	3.486	1.549	0.070	0.063	0.028	
TBMM108*004□□SB0^++	V	1000	40	18	400	400	6	9	10	0.285	3.979	3.581	1.592	0.072	0.064	0.029	
TBME158*004□□SB0^++	E	1500	40	15	400	400	6	9	10	0.270	4.243	3.818	1.697	0.064	0.057	0.025	
<b>6 Volt @ 85°C (4 Volt @ 125°C)</b>																	
TBMD337*006□□SB0^++	D	330	14.9	35	298	149	8	11	12	0.255	2.699	2.429	1.080	0.094	0.085	0.038	
TBME477*006□□SB0^++	E	470	21.2	30	424	212	6	9	10	0.270	3.000	2.700	1.200	0.090	0.081	0.036	
TBME477*006□□SB0^++	E	470	28	18	280	560	6	9	10	0.270	3.873	3.486	1.549	0.070	0.063	0.028	
TBME687*006□□SB0^++	E	680	41	18	410	820	6	9	10	0.270	3.873	3.486	1.549	0.070	0.063	0.028	
TBMM687*006□□SB0^++	V	680	41	23	410	820	6	9	10	0.285	3.520	3.168	1.408	0.081	0.073	0.032	
<b>10 Volt @ 85°C (7 Volt @ 125°C)</b>																	
TBMD227*010□□SB0^++	D	220	16.5	35	330	165	8	11	12	0.255	2.699	2.429	1.080	0.094	0.085	0.038	
TBME337*010□□SB0^++	E	330	24.8	35	496	248	6	9	10	0.270	2.777	2.500	1.111	0.097	0.087	0.039	
TBME337*010□□SB0^++	E	330	33	23	330	660	6	9	10	0.270	3.426	3.084	1.370	0.079	0.071	0.032	
TBME477*010□□SB0^++	E	470	47	23	470	940	6	9	10	0.270	3.426	3.084	1.370	0.079	0.071	0.032	
<b>12 Volt @ 85°C (8.4 Volt @ 125°C)</b>																	
TBME227*012□□SB0^++	E	220	19.8	35	198	99	6	9	10	0.270	2.777	2.500	1.111	0.097	0.087	0.039	
<b>16 Volt @ 85°C (10 Volt @ 125°C)</b>																	
TBME157*016□□SB0^++	E	150	18	40	180	360	6	9	10	0.270	2.598	2.338	1.039	0.104	0.094	0.042	
TBME157*016□□SB0^++	E	150	18	30	180	360	6	9	10	0.270	3.000	2.700	1.200	0.090	0.081	0.036	
TBME227*016□□SB0^++	E	220	35	25	350	700	6	9	10	0.270	3.286	2.968	1.315	0.082	0.074	0.033	
<b>20 Volt @ 85°C (13 Volt @ 125°C)</b>																	
TBME107*020□□SB0^++	E	100	15	45	300	150	6	9	10	0.270	2.449	2.205	0.980	0.110	0.099	0.044	
TBME107*020□□SB0^++	E	100	15	35	300	300	6	9	10	0.270	2.777	2.500	1.111	0.097	0.087	0.039	
<b>25 Volt @ 85°C (17 Volt @ 125°C)</b>																	
TBMD336*025□□SB0^++	D	33	6.2	65	62	62	8	11	12	0.255	1.981	1.783	0.792	0.129	0.116	0.051	
TBME476*025□□SB0^++	E	47	8.8	65	88	176	6	9	10	0.270	2.038	1.834	0.815	0.132	0.119	0.053	
TBME686*025□□SB0^++	E	68	17	45	170	340	6	9	10	0.270	2.449	2.205	0.980	0.110	0.099	0.044	
<b>35 Volt @ 85°C (23 Volt @ 125°C)</b>																	
TBMD226*035□□SB0^++	D	22	5.8	70	58	58	8	11	12	0.255	1.909	1.718	0.763	0.134	0.120	0.053	
TBME226*035□□SB0^++	E	22	5.8	100	58	116	6	9	10	0.270	1.643	1.479	0.657	0.164	0.148	0.066	
TBME226*035□□SB0^++	E	22	35	60	58	116	6	9	10	0.270	2.121	1.909	0.849	0.127	0.115	0.051	
TBME336*035□□SB0^++	E	33	8.7	65	87	174	6	9	10	0.270	2.038	1.834	0.815	0.132	0.119	0.053	
TBME336*035□□SB0^++	E	33	8.7	50	87	174	6	9	10	0.270	2.324	2.091	0.930	0.116	0.105	0.046	
TBME476*035□□SB0^++	E	47	16	55	160	320	6	9	10	0.270	2.216	1.994	0.886	0.122	0.110	0.049	

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.

**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.**