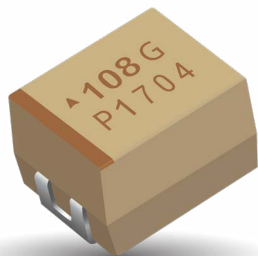


TBM MULTIANODE

Tantalum Ultra Low ESR COTS-Plus



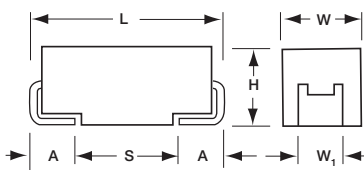
TBM COTS-Plus series uses an internal multi-anode design to achieve ultra-low ESR which improves performance in high ripple power applications.

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.



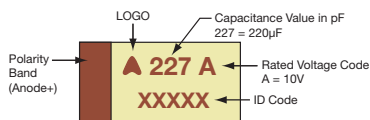
CASE DIMENSIONS: millimeters (inches)

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 ₁ ±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 (0.122)	1.30 (0.051)	4.40 (0.173)

W₁ 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

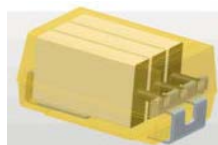
Capacitance		Rated Voltage DC (V _R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6V (J)	10V (A)	12V (B)	16V (C)	20V (D)	25V (E)	35V (V)
22	226									D(70) E(60,100)
33	336								D(65)	E(50,65)
47	476								E(65)	E(55)
68	686								E(45)	
100	107							E(35,45)		
150	157						E(30,40)			
220	227				D(35)	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)

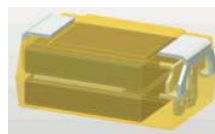
Notes: Voltage ratings are minimum values. KYOCERA AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

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



TBM MULTIANODE

Tantalum Ultra Low ESR COTS-Plus

HOW TO ORDER

COTS-PLUS:

TBM	E	477	*	006	L	□	#	@	0	^	++
Type	Case Size	Capacitance Code pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	Capacitance Tolerance M = ±20% K = ±10%	Voltage Code 002 = 2.5Vdc 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 012 = 12Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc	Standard or Low ESR Range C = Std ESR L = Low ESR	Packaging B = Bulk R = 7" T&R S = 13" T&R W = Waffle See page 8 for additional packaging options.	Inspection Level S = Std. Conformance L = Group A	Reliability Grade Weibull: C = 0.01%/1000 hrs. 90% conf. Z = Non-ER	Qualification Level 0 = N/A	Termination Finish H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn	Surge Test Option 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull



For RoHS compliant products, please select correct termination style.

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 _R)	≤ +85°C:	2.5	4	6	10	12	16	20	25	35	
Category Voltage (V _C)	≤ +125°C:	1.7	2.7	4	7	8.4	10	13	17	23	
Surge Voltage (V _S)	≤ +85°C:	3.3	5.2	8	13	15.6	20	26	32	46	
Surge Voltage (V _S)	≤ +125°C:	2.2	3.4	5	8	9.6	12	16	20	28	
Temperature Range:	-55°C to +125°C										

TBM MULTIANODE

Tantalum Ultra Low ESR COTS-Plus

RATING & PART NUMBER REFERENCE		Parametric Specifications by Rating									Typical RMS Ripple Data			
		Cap @ 120Hz	DC Rated Voltage	ESR @ 100kHz	DCL max			DF Max			Power Dissipation	25°C Ripple Current	85°C Ripple Current	125°C Ripple Current
					+25°C	+85°C	+125°C	+25°C	+(85/125)°C	-55°C				
P/N	Case	µF @ 25°C	V @ +85°C	mOhms @ +25°C	(µA)	(µA)	(µA)	(%)	(%)	(%)	W	A (100kHz)	A (100kHz)	A (100kHz)
2.5 Volt @ 85°C (1.7 Volt @ 125°C)														
TBMD108*002L□#@0^++	D	1000	2.5	25	18.8	188	376	8	11	12	0.255	3.194	2.874	1.277
TBME158*002C□#@0^++	E	1500	2.5	18	28.1	281	562	6	9	10	0.270	3.873	3.486	1.549
TBME158*002L□#@0^++	E	1500	2.5	12	38	380	760	6	9	10	0.270	4.743	4.269	1.897
4 Volt @ 85°C (2.7 Volt @ 125°C)														
TBMD337*004L□#@0^++	D	330	4	35	9.9	99	198	8	11	12	0.255	2.699	2.429	1.080
TBMD477*004L□#@0^++	D	470	4	35	14.1	141	282	8	11	12	0.255	2.699	2.429	1.080
TBME687*004C□#@0^++	E	680	4	23	20.4	204	408	6	9	10	0.270	3.426	3.084	1.370
TBME687*004L□#@0^++	E	680	4	18	27	270	540	6	9	10	0.270	3.873	3.486	1.549
TBME108*004C□#@0^++	E	1000	4	23	30	300	600	6	9	10	0.270	3.426	3.084	1.370
TBME108*004L□#@0^++	E	1000	4	18	40	400	800	6	9	10	0.270	3.873	3.486	1.549
TBMV108*004L□#@0^++	V	1000	4	18	40	400	800	6	9	10	0.285	3.979	3.581	1.592
TBME158*004L□#@0^++	E	1500	4	15	40	400	800	6	9	10	0.270	4.243	3.818	1.697
6 Volt @ 85°C (4 Volt @ 125°C)														
TBMD337*006L□#@0^++	D	330	6	35	14.9	149	298	8	11	12	0.255	2.699	2.429	1.080
TBME477*006C□#@0^++	E	470	6	30	21.2	212	424	6	9	10	0.270	3.000	2.700	1.200
TBME477*006L□#@0^++	E	470	6	18	28	280	560	6	9	10	0.270	3.873	3.486	1.549
TBME687*006L□#@0^++	E	680	6	18	41	410	820	6	9	10	0.270	3.873	3.486	1.549
TBMV687*006L□#@0^++	V	680	6	23	41	410	820	6	9	10	0.285	3.520	3.168	1.408
10 Volt @ 85°C (7 Volt @ 125°C)														
TBMD227*010L□#@0^++	D	220	10	35	16.5	165	330	8	11	12	0.255	2.699	2.429	1.080
TBME337*010C□#@0^++	E	330	10	35	24.8	248	496	6	9	10	0.270	2.777	2.500	1.111
TBME337*010L□#@0^++	E	330	10	23	33	330	660	6	9	10	0.270	3.426	3.084	1.370
TBME477*010L□#@0^++	E	470	10	23	47	470	940	6	9	10	0.270	3.426	3.084	1.370
12 Volt @ 85°C (8.4 Volt @ 125°C)														
TBME227*012C□#@0^++	E	220	12	35	19.8	198	396	6	9	10	0.270	2.777	2.500	1.111
16 Volt @ 85°C (10 Volt @ 125°C)														
TBME157*016C□#@0^++	E	150	16	40	18	180	360	6	9	10	0.270	2.598	2.338	1.039
TBME157*016L□#@0^++	E	150	16	30	18	180	360	6	9	10	0.270	3.000	2.700	1.200
TBME227*016L□#@0^++	E	220	16	25	35	350	700	6	9	10	0.270	3.286	2.958	1.315
20 Volt @ 85°C (13 Volt @ 125°C)														
TBME107*020C□#@0^++	E	100	20	45	15	150	300	6	9	10	0.270	2.449	2.205	0.980
TBME107*020L□#@0^++	E	100	20	35	15	150	300	6	9	10	0.270	2.777	2.500	1.111
25 Volt @ 85°C (17 Volt @ 125°C)														
TBMD336*025L□#@0^++	D	33	25	65	6.2	62	124	8	11	12	0.255	1.981	1.783	0.792
TBME476*025C□#@0^++	E	47	25	65	8.8	88	176	6	9	10	0.270	2.038	1.834	0.815
TBME686*025L□#@0^++	E	68	25	45	17	170	340	6	9	10	0.270	2.449	2.205	0.980
35 Volt @ 85°C (23 Volt @ 125°C)														
TBMD226*035L□#@0^++	D	22	35	70	5.8	58	116	8	11	12	0.255	1.909	1.718	0.763
TBME226*035C□#@0^++	E	22	35	100	5.8	58	116	6	9	10	0.270	1.643	1.479	0.657
TBME226*035L□#@0^++	E	22	35	60	5.8	58	116	6	9	10	0.270	2.121	1.909	0.849
TBME336*035C□#@0^++	E	33	35	65	8.7	87	174	6	9	10	0.270	2.038	1.834	0.815
TBME336*035L□#@0^++	E	33	35	50	8.7	87	174	6	9	10	0.270	2.324	2.091	0.930
TBME476*035L□#@0^++	E	47	35	55	16	160	320	6	9	10	0.270	2.216	1.994	0.886

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 100 hours.

NOTE: KYOCERA AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.