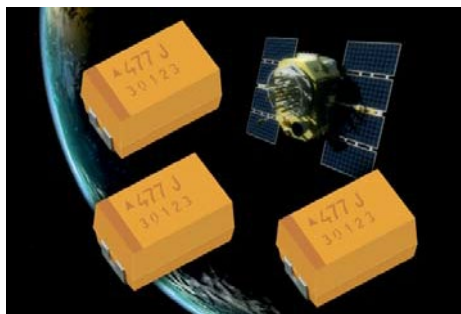


# TBM MULTIANODE

## Tantalum Ultra Low ESR COTS-Plus



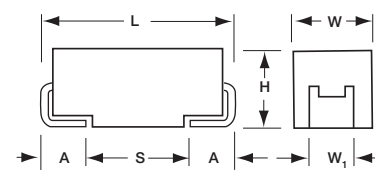
TBM COTS-Plus series uses an internal multi-anode design to achieve ultra-low ESR which improves performance in high ripple power applications.

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.



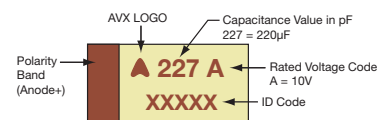
### CASE DIMENSIONS: millimeters (inches)

| Code | L±0.20<br>(0.008) | W±0.20 (0.008)<br>-0.10 (0.004) | H±0.20 (0.008)<br>-0.10 (0.004) | W <sub>1</sub> ±0.20<br>(0.008) | A±0.30 (0.012)<br>-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) |

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

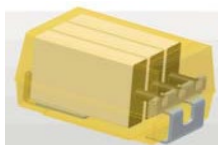
| Capacitance |      | Rated Voltage DC (V <sub>R</sub> ) to 85°C |                   |              |          |         |          |          |         |                    |
|-------------|------|--------------------------------------------|-------------------|--------------|----------|---------|----------|----------|---------|--------------------|
| 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)<br>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)<br>V(18) |              |          |         |          |          |         |                    |
| 1500        | 158  | E(12,18)                                   | E(15)             |              |          |         |          |          |         |                    |
| 2000        | 208  |                                            |                   |              |          |         |          |          |         |                    |

Available Ratings: ESR limits quoted in brackets (mOhms)

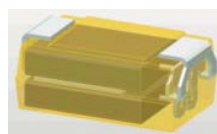
Notes: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

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

^

++

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

LEAD-FREE  
LEAD-FREE COMPATIBLE COMPONENT

RoHS  
COMPLIANT

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 <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                                                                          |     |     |   |    |      |    |    |    |    |  |  |

# TBM MULTIANODE

## Tantalum Ultra Low ESR COTS-Plus



| RATING & PART<br>NUMBER REFERENCE  |      | Parametric Specifications by Rating |                     |                  |         |       |        |        |             |       | Typical RMS Ripple Data by Rating |                           |                           |                            |                           |                           |                            |
|------------------------------------|------|-------------------------------------|---------------------|------------------|---------|-------|--------|--------|-------------|-------|-----------------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|----------------------------|
|                                    |      | Cap<br>@ 120Hz                      | DC Rated<br>Voltage | ESR<br>@ 100kHz  | DCL max |       |        | DF Max |             |       | Power<br>Dissipation              | 25°C<br>Ripple<br>Current | 85°C<br>Ripple<br>Current | 125°C<br>Ripple<br>Current | 25°C<br>Ripple<br>Voltage | 85°C<br>Ripple<br>Voltage | 125°C<br>Ripple<br>Voltage |
|                                    |      |                                     |                     |                  | +25°C   | +85°C | +125°C | +25°C  | +(85/125)°C | -55°C |                                   |                           |                           |                            |                           |                           |                            |
| AVX P/N                            | Case | µF @<br>25°C                        | V @<br>+85°C        | mOhms<br>@ +25°C | (µA)    | (µA)  | (µA)   | (%)    | (%)         | (%)   | W                                 | A<br>(100kHz)             | A<br>(100kHz)             | A<br>(100kHz)              | V<br>(100kHz)             | V<br>(100kHz)             | V<br>(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                      | 0.080                     | 0.072                     | 0.032                      |
| TBME158*002C□#@0^++                | E    | 1500                                | 2.5                 | 18               | 28.1    | 281   | 562    | 6      | 9           | 10    | 0.270                             | 3.873                     | 3.486                     | 1.549                      | 0.070                     | 0.063                     | 0.028                      |
| TBME158*002L□#@0^++                | E    | 1500                                | 2.5                 | 12               | 38      | 380   | 760    | 6      | 9           | 10    | 0.270                             | 4.743                     | 4.269                     | 1.897                      | 0.057                     | 0.051                     | 0.023                      |
| 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                      | 0.094                     | 0.085                     | 0.038                      |
| TBMD477*004L□#@0^++                | D    | 470                                 | 4                   | 35               | 14.1    | 141   | 282    | 8      | 11          | 12    | 0.255                             | 2.699                     | 2.429                     | 1.080                      | 0.094                     | 0.085                     | 0.038                      |
| TBME687*004C□#@0^++                | E    | 680                                 | 4                   | 23               | 20.4    | 204   | 408    | 6      | 9           | 10    | 0.270                             | 3.426                     | 3.084                     | 1.370                      | 0.079                     | 0.071                     | 0.032                      |
| TBME687*004L□#@0^++                | E    | 680                                 | 4                   | 18               | 27      | 270   | 540    | 6      | 9           | 10    | 0.270                             | 3.873                     | 3.486                     | 1.549                      | 0.070                     | 0.063                     | 0.028                      |
| TBME108*004C□#@0^++                | E    | 1000                                | 4                   | 23               | 30      | 300   | 600    | 6      | 9           | 10    | 0.270                             | 3.426                     | 3.084                     | 1.370                      | 0.079                     | 0.071                     | 0.032                      |
| TBME108*004L□#@0^++                | E    | 1000                                | 4                   | 18               | 40      | 400   | 800    | 6      | 9           | 10    | 0.270                             | 3.873                     | 3.486                     | 1.549                      | 0.070                     | 0.063                     | 0.028                      |
| TBMV108*004L□#@0^++                | V    | 1000                                | 4                   | 18               | 40      | 400   | 800    | 6      | 9           | 10    | 0.285                             | 3.979                     | 3.581                     | 1.592                      | 0.072                     | 0.064                     | 0.029                      |
| TBME158*004L□#@0^++                | E    | 1500                                | 4                   | 15               | 40      | 400   | 800    | 6      | 9           | 10    | 0.270                             | 4.243                     | 3.818                     | 1.697                      | 0.064                     | 0.057                     | 0.025                      |
| 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                      | 0.094                     | 0.085                     | 0.038                      |
| TBME477*006C□#@0^++                | E    | 470                                 | 6                   | 30               | 21.2    | 212   | 424    | 6      | 9           | 10    | 0.270                             | 3.000                     | 2.700                     | 1.200                      | 0.090                     | 0.081                     | 0.036                      |
| TBME477*006L□#@0^++                | E    | 470                                 | 6                   | 18               | 28      | 280   | 560    | 6      | 9           | 10    | 0.270                             | 3.873                     | 3.486                     | 1.549                      | 0.070                     | 0.063                     | 0.028                      |
| TBME687*006L□#@0^++                | E    | 680                                 | 6                   | 18               | 41      | 410   | 820    | 6      | 9           | 10    | 0.270                             | 3.873                     | 3.486                     | 1.549                      | 0.070                     | 0.063                     | 0.028                      |
| TBMV687*006L□#@0^++                | V    | 680                                 | 6                   | 23               | 41      | 410   | 820    | 6      | 9           | 10    | 0.285                             | 3.520                     | 3.168                     | 1.408                      | 0.081                     | 0.073                     | 0.032                      |
| 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                      | 0.094                     | 0.085                     | 0.038                      |
| TBME337*010C□#@0^++                | E    | 330                                 | 10                  | 35               | 24.8    | 248   | 496    | 6      | 9           | 10    | 0.270                             | 2.777                     | 2.500                     | 1.111                      | 0.097                     | 0.087                     | 0.039                      |
| TBME337*010L□#@0^++                | E    | 330                                 | 10                  | 23               | 33      | 330   | 660    | 6      | 9           | 10    | 0.270                             | 3.426                     | 3.084                     | 1.370                      | 0.079                     | 0.071                     | 0.032                      |
| TBME477*010L□#@0^++                | E    | 470                                 | 10                  | 23               | 47      | 470   | 940    | 6      | 9           | 10    | 0.270                             | 3.426                     | 3.084                     | 1.370                      | 0.079                     | 0.071                     | 0.032                      |
| 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                      | 0.097                     | 0.087                     | 0.039                      |
| 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                      | 0.104                     | 0.094                     | 0.042                      |
| TBME157*016L□#@0^++                | E    | 150                                 | 16                  | 30               | 18      | 180   | 360    | 6      | 9           | 10    | 0.270                             | 3.000                     | 2.700                     | 1.200                      | 0.090                     | 0.081                     | 0.036                      |
| TBME227*016L□#@0^++                | E    | 220                                 | 16                  | 25               | 35      | 350   | 700    | 6      | 9           | 10    | 0.270                             | 3.286                     | 2.958                     | 1.315                      | 0.082                     | 0.074                     | 0.033                      |
| 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                      | 0.110                     | 0.099                     | 0.044                      |
| TBME107*020L□#@0^++                | E    | 100                                 | 20                  | 35               | 15      | 150   | 300    | 6      | 9           | 10    | 0.270                             | 2.777                     | 2.500                     | 1.111                      | 0.097                     | 0.087                     | 0.039                      |
| 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                      | 0.129                     | 0.116                     | 0.051                      |
| TBME476*025L□#@0^++                | E    | 47                                  | 25                  | 65               | 8.8     | 88    | 176    | 6      | 9           | 10    | 0.270                             | 2.038                     | 1.834                     | 0.815                      | 0.132                     | 0.119                     | 0.053                      |
| TBME686*025L□#@0^++                | E    | 68                                  | 25                  | 45               | 17      | 170   | 340    | 6      | 9           | 10    | 0.270                             | 2.449                     | 2.205                     | 0.980                      | 0.110                     | 0.099                     | 0.044                      |
| 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                      | 0.134                     | 0.120                     | 0.053                      |
| TBME226*035C□#@0^++                | E    | 22                                  | 35                  | 100              | 5.8     | 58    | 116    | 6      | 9           | 10    | 0.270                             | 1.643                     | 1.479                     | 0.657                      | 0.164                     | 0.148                     | 0.066                      |
| TBME226*035L□#@0^++                | E    | 22                                  | 35                  | 60               | 5.8     | 58    | 116    | 6      | 9           | 10    | 0.270                             | 2.121                     | 1.909                     | 0.849                      | 0.127                     | 0.115                     | 0.051                      |
| TBME336*035C□#@0^++                | E    | 33                                  | 35                  | 65               | 8.7     | 87    | 174    | 6      | 9           | 10    | 0.270                             | 2.038                     | 1.834                     | 0.815                      | 0.132                     | 0.119                     | 0.053                      |
| TBME336*035L□#@0^++                | E    | 33                                  | 35                  | 50               | 8.7     | 87    | 174    | 6      | 9           | 10    | 0.270                             | 2.324                     | 2.091                     | 0.930                      | 0.116                     | 0.105                     | 0.046                      |
| TBME476*035L□#@0^++                | E    | 47                                  | 35                  | 55               | 16      | 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.**

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9