

# TPM Multianode

## Tantalum Ultra Low ESR Capacitor



### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance |      | Rated Voltage DC (V <sub>R</sub> ) 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)<br>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) <sup>(M)</sup> | D(40,50)             | E(35,45) | E(45,60)    |                    |               |
| 150         | 157  |                                            |                                        |                                            | Y(45) <sup>(M)</sup> | E(30,40)             | E(35)    |             |                    |               |
| 220         | 227  |                                            |                                        | Y(30) <sup>(M)</sup>                       | D(35)                | E(25,40)<br>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)<br>E(18,23,30)                       | E(23,30)<br>U(23,30) |                      |          |             |                    |               |
| 680         | 687  |                                            | D(25)/E(18,23)                         | E(18,23)<br>U(18,23)/V(23)                 |                      |                      |          |             |                    |               |
| 1000        | 108  | D(25)                                      | D(25,45)<br>E(18,23)<br>U(18,23)/V(18) | E(25) <sup>(M)</sup> /V(20) <sup>(M)</sup> |                      |                      |          |             |                    |               |
| 1500        | 158  | E(12,15,18)<br>U(18,23)                    | E(15,18)                               |                                            |                      |                      |          |             |                    |               |
| 2200        | 228  | E(18) <sup>(M)</sup>                       |                                        |                                            |                      |                      |          |             |                    |               |

Released ratings <sup>(M tolerance only)</sup>, (ESR ratings in mOhms in parentheses)

Note: Voltage ratings are minimum values. KYOCERA 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

| Part Number      | 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*002R0018 | U         | 1500             | 2.5               | 85                     | 1.7                  | 125                       | 30            | 6           | 18                     | 4.048                  | 3.643 | 1.619 | 3   |
| TPMU158*002R0023 | 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*004R0018 | U         | 1000             | 4                 | 85                     | 2.7                  | 125                       | 40            | 6           | 18                     | 4.048                  | 3.643 | 1.619 | 3   |
| TPMU108*004R0023 | 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                       | 60            | 6           | 15                     | 4.243                  | 3.818 | 1.697 | 3   |
| TPME158*004#0018 | E         | 1500             | 4                 | 85                     | 2.7                  | 125                       | 60            | 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*006R0018 | U         | 680              | 6.3               | 85                     | 4                    | 125                       | 41            | 6           | 18                     | 4.048                  | 3.643 | 1.619 | 3   |
| TPMU687*006R0023 | 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*010R0023 | U         | 470              | 10                | 85                     | 7                    | 125                       | 47            | 8           | 23                     | 3.581                  | 3.223 | 1.433 | 3   |
| TPMU477*010R0030 | 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*016R0030 | U         | 220              | 16                | 85                     | 10                   | 125                       | 35            | 8           | 30                     | 3.136                  | 2.822 | 1.254 | 3   |
| TPMU227*016R0040 | U         | 220              | 16                | 85                     | 10                   | 125                       | 35            | 8           | 40                     | 2.716                  | 2.444 | 1.086 | 3   |
| TPME337*016#0050 | E         | 330              | 16                | 85                     | 10                   | 125                       | 52.8          | 10          | 50                     | 2.324                  | 2.091 | 0.930 | 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   |

# TPM Multianode

## Tantalum Ultra Low ESR Capacitor



### RATINGS & PART NUMBER REFERENCE

| Part Number      | 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 259.

**NOTE: KYOCERA 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

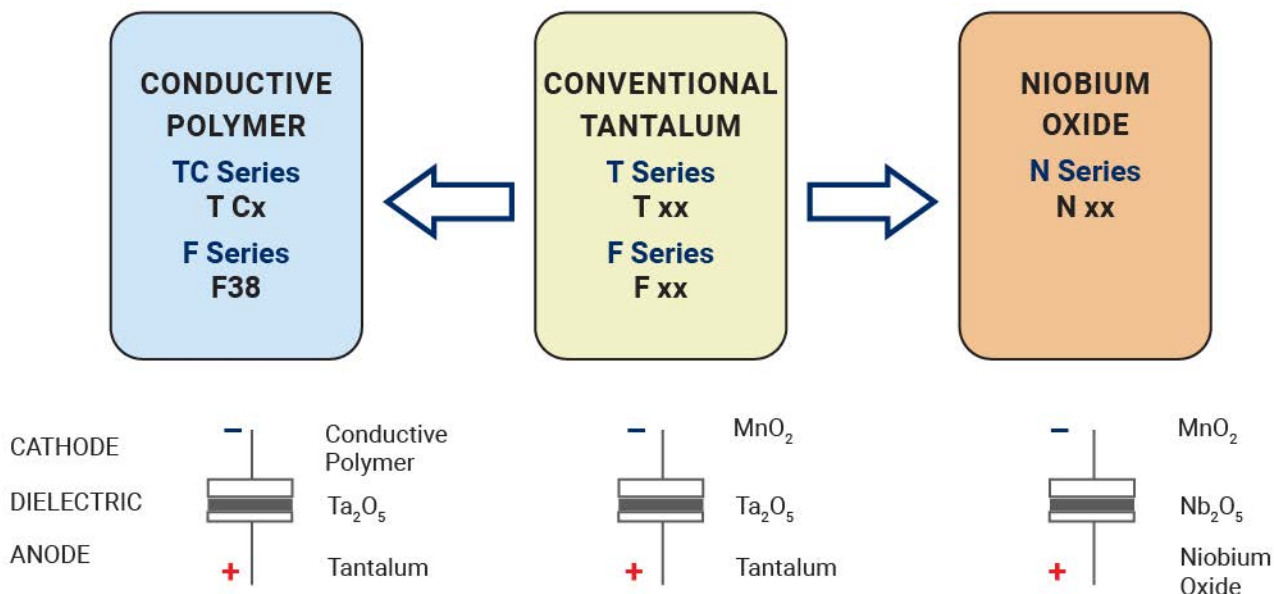
| TEST                  | TPM series (Temperature range -55°C to +125°C)                                                                                                                                                |               |               |                    |                              |           |          |           |            |          |  |  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|--------------------|------------------------------|-----------|----------|-----------|------------|----------|--|--|
|                       | Condition                                                                                                                                                                                     |               |               | Characteristics    |                              |           |          |           |            |          |  |  |
| Endurance             | Apply rated voltage (Ur) at 85°C and / or category-voltage (Uc) at 125°C for 2000 hours through a circuit impedance of ≤0.1Ω/V. Stabilize at room temperature for 1-2 hours before measuring. |               |               | 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              | Store at 65°C and 95% relative humidity for 500 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.                                    |               |               | 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           | 15            |                    |                              |           |          |           |            |          |  |  |
|                       | 2                                                                                                                                                                                             | -55           | 15            | DCL                | IL*                          | n/a       | IL*      | 10 x IL*  | 12.5 x IL* | IL*      |  |  |
|                       | 3                                                                                                                                                                                             | +20           | 15            | ΔC/C               | n/a                          | +0/-10%   | ±5%      | +10/-0%   | +12/-0%    | ±5%      |  |  |
|                       | 4                                                                                                                                                                                             | +85           | 15            | DF                 | IL*                          | 1.5 x IL* | IL*      | 1.5 x IL* | 2 x IL*    | IL*      |  |  |
|                       | 5                                                                                                                                                                                             | +125          | 15            |                    |                              |           |          |           |            |          |  |  |
|                       | 6                                                                                                                                                                                             | +20           | 15            | ESR                | 1.25xIL*                     | 2.5xIL*   | 1.25xIL* | 1.25xIL*  | 1.25xIL*   | 1.25xIL* |  |  |
| Surge Voltage         | Apply 1.3x category voltage (Uc) at 125°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000Ω                          |               |               | Visual examination | no visible damage            |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | DCL                | initial limit                |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | ΔC/C               | within ±5% of initial value  |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | DF                 | initial limit                |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | ESR                | 1.25 x initial limit         |           |          |           |            |          |  |  |
| Mechanical Shock      | MIL-STD-202, Method 213, Condition C                                                                                                                                                          |               |               | Visual examination | no visible damage            |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | DCL                | initial limit                |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | ΔC/C               | within ±5% of initial value  |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | DF                 | initial limit                |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | ESR                | initial limit                |           |          |           |            |          |  |  |
| Vibration             | MIL-STD-202, Method 204, Condition D                                                                                                                                                          |               |               | Visual examination | no visible damage            |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | DCL                | initial limit                |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | ΔC/C               | within ±5% of initial value  |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | DF                 | initial limit                |           |          |           |            |          |  |  |
|                       |                                                                                                                                                                                               |               |               | ESR                | initial limit                |           |          |           |            |          |  |  |

\*Initial Limit

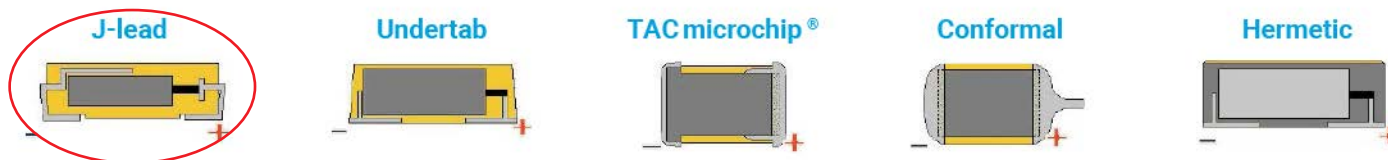
# TPM Multianode

## Tantalum Ultra Low ESR Capacitor

### SOLID ELECTROLYTIC CAPACITOR ROADMAP



### FIVE CAPACITOR CONSTRUCTION STYLES



### SERIES LINE UP : CONVENTIONAL SMD $MnO_2$

