

TRM Professional Multianode

Tantalum Ultra Low ESR Capacitor



FEATURES

- Improved reliability – 0.5%/1khrs (twice better than standard)
- DCL reduced by 25% to 0.0075 CV
- Robust against higher thermo-mechanical stresses during assembly process
- Multi-anode construction
- Super low ESR
- CV range 4.7-1500µF / 2.5-50V
- “Mirror” construction used with D case capacitors reduces ESL to half
- Automotive, industrial and other higher end applications



SnPb termination option is not RoHS compliant.

APPLICATIONS

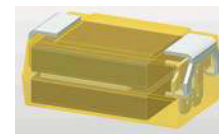
- Automotive, Avionics and Industrial high power DC/DC converters



MULTIANODE CONSTRUCTION



MULTIANODE TPM D, Y LOW SELF INDUCTANCE CONSTRUCTION “MIRROR” DESIGN



MARKING

D, E, U CASE



CASE DIMENSIONS: millimeters (inches)

| Code | EIA Code | EIA Metric | 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 | 2917 | 7343-31 | 7.30 (0.287) | 4.30 (0.169) | 2.90 (0.114) | 2.40 (0.094) | 1.30 (0.051) | 4.40 (0.173) |
| E | 2917 | 7343-43 | 7.30 (0.287) | 4.30 (0.169) | 4.10 (0.162) | 2.40 (0.094) | 1.30 (0.051) | 4.40 (0.173) |
| U | 2924 | 7361-43 | 7.30 (0.287) | 6.10 (0.240) | 4.10 (0.162) | 3.10 (0.122) | 1.30 (0.051) | 4.40 (0.173) |

W1 dimension applies to the termination width for A dimensional area only.

HOW TO ORDER

| TRM | E | 108 | * | 004 | R | 0023 |
|------|------------------------------|--|-----------------------------------|---|--|-----------|
| Type | Case Size See table above | Capacitance Code pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | Tolerance K = ±10% M = ±20% | Rated DC Voltage 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 012 = 12Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc | Packaging R = Pure Tin 7" Reel S = Pure Tin 13" Reel H = Tin Lead 7" Reel (Contact Manufacturer) K = Tin Lead 13" Reel (Contact Manufacturer) H, K = Non RoHS | ESR in mΩ |

TECHNICAL SPECIFICATIONS

| | | | | | | | | | | | |
|------------------------------------|--|-----|-----|-----|----|----|----|----|----|----|----|
| Technical Data: | All technical data relate to an ambient temperature of +25°C | | | | | | | | | | |
| Capacitance Range: | 4.7 µF to 1500 µF | | | | | | | | | | |
| Capacitance Tolerance: | ±10%; ±20% | | | | | | | | | | |
| Rated Voltage (V _R) | ≤ +85°C: | 2.5 | 4 | 6.3 | 10 | 12 | 16 | 20 | 25 | 35 | 50 |
| Category Voltage (V _C) | ≤ +125°C: | 1.7 | 2.7 | 4 | 7 | 8 | 10 | 13 | 17 | 23 | 33 |
| Surge Voltage (V _S) | ≤ +85°C: | 3.3 | 5.2 | 8 | 13 | 16 | 20 | 26 | 32 | 46 | 65 |
| Surge Voltage (V _S) | ≤ +125°C: | 2.2 | 3.4 | 5 | 8 | 10 | 13 | 16 | 20 | 28 | 40 |
| Temperature Range: | -55°C to +125°C | | | | | | | | | | |
| Reliability: | 0.5% per 1000 hours at 85°C, V _R with 0.1Ω/V series impedance, 60% confidence level | | | | | | | | | | |
| | Meets requirements of AEC-Q200 | | | | | | | | | | |



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CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance | | Rated Voltage DC (V _R) to 85°C | | | | | | | | | |
|-------------|------|--|-------------------|----------|----------|---------|----------|----------|---------|--------------------|---------|
| µF | Code | 2.5V (e) | 4V (G) | 6.3V (J) | 10V (A) | 12V (B) | 16V (C) | 20V (D) | 25V (E) | 35V (V) | 50V (T) |
| 4.7 | 475 | | | | | | | | | | D(200) |
| 6.8 | 685 | | | | | | | | | | |
| 10 | 106 | | | | | | | | | D(120) | |
| 15 | 156 | | | | | | | | | | |
| 22 | 226 | | | | | | | | | D(70) E(60,100) | |
| 33 | 336 | | | | | | | | D(65) | E(50,65) | |
| 47 | 476 | | | | | | D(100) | D(55) | E(65) | | |
| 68 | 686 | | | | | | | | | | |
| 100 | 107 | | | | | | | E(35,45) | | | |
| 150 | 157 | | | | D(45) | | E(30,40) | | | | |
| 220 | 227 | | | | D(35) | E(35) | U(30,40) | | | | |
| 330 | 337 | | D(35) | D(35) | E(35) | | | | | | |
| 470 | 477 | | D(35) | E(30) | U(23,30) | | | | | | |
| 680 | 687 | | E(23) | U(18,23) | | | | | | | |
| 1000 | 108 | D(25) | E(23) U(18,23) | | | | | | | | |
| 1500 | 158 | E(18) U(18,23) | | | | | | | | | |

Released ratings, (ESR ratings in mOhms in parentheses)

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

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RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (µF) | Rated Voltage (V) | Rated Temperature (°C) | Category Voltage (V) | Category Temperature (°C) | DCL Max. (µA) | DF Max. (%) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (A) | | | MSL |
|------------------------|-----------|------------------|-------------------|------------------------|----------------------|---------------------------|---------------|-------------|------------------------|------------------------|-------|-------|-----|
| | | | | | | | | | | 25°C | 85°C | 125°C | |
| 2.5 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD108*002#0025 | D | 1000 | 2.5 | 85 | 1.7 | 125 | 18.8 | 8 | 25 | 3.194 | 2.874 | 1.277 | 3 |
| TRME158*002#0018 | E | 1500 | 2.5 | 85 | 1.7 | 125 | 28.1 | 6 | 18 | 3.873 | 3.486 | 1.549 | 3 |
| TRMU158*002R0018 | U | 1500 | 2.5 | 85 | 1.7 | 125 | 22.5 | 6 | 18 | 4.048 | 3.643 | 1.619 | 3 |
| TRMU158*002R0023 | U | 1500 | 2.5 | 85 | 1.7 | 125 | 22.5 | 6 | 23 | 3.581 | 3.223 | 1.433 | 3 |
| 4 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD337*004#0035 | D | 330 | 4 | 85 | 2.7 | 125 | 9.9 | 8 | 35 | 2.699 | 2.429 | 1.080 | 3 |
| TRMD477*004#0035 | D | 470 | 4 | 85 | 2.7 | 125 | 14.1 | 8 | 35 | 2.699 | 2.429 | 1.080 | 3 |
| TRME687*004#0023 | E | 680 | 4 | 85 | 2.7 | 125 | 20.4 | 6 | 23 | 3.426 | 3.084 | 1.370 | 3 |
| TRME108*004#0023 | E | 1000 | 4 | 85 | 2.7 | 125 | 30 | 6 | 23 | 3.426 | 3.084 | 1.370 | 3 |
| TRMU108*004R0018 | U | 1000 | 4 | 85 | 2.7 | 125 | 30 | 6 | 18 | 4.048 | 3.643 | 1.619 | 3 |
| TRMU108*004R0023 | U | 1000 | 4 | 85 | 2.7 | 125 | 30 | 6 | 23 | 3.581 | 3.223 | 1.433 | 3 |
| 6.3 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD337*006#0035 | D | 330 | 6.3 | 85 | 4 | 125 | 14.9 | 8 | 35 | 2.699 | 2.429 | 1.080 | 3 |
| TRME477*006#0030 | E | 470 | 6.3 | 85 | 4 | 125 | 21.2 | 6 | 30 | 3.000 | 2.700 | 1.200 | 3 |
| TRMU687*006R0018 | U | 680 | 6.3 | 85 | 4 | 125 | 30.6 | 6 | 18 | 4.048 | 3.643 | 1.619 | 3 |
| TRMU687*006R0023 | U | 680 | 6.3 | 85 | 4 | 125 | 30.6 | 6 | 23 | 3.581 | 3.223 | 1.433 | 3 |
| 10 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD157*010#0045 | D | 150 | 10 | 85 | 7 | 125 | 11.3 | 8 | 45 | 2.380 | 2.142 | 0.952 | 3 |
| TRMD227*010#0035 | D | 220 | 10 | 85 | 7 | 125 | 16.5 | 8 | 35 | 2.699 | 2.429 | 1.080 | 3 |
| TRME337*010#0035 | E | 330 | 10 | 85 | 7 | 125 | 24.8 | 6 | 35 | 2.777 | 2.500 | 1.111 | 3 |
| TRMU477*010R0023 | U | 470 | 10 | 85 | 7 | 125 | 35.3 | 8 | 23 | 3.581 | 3.223 | 1.433 | 3 |
| TRMU477*010R0030 | U | 470 | 10 | 85 | 7 | 125 | 35.3 | 8 | 30 | 3.136 | 2.822 | 1.254 | 3 |
| 12 Volt @ 85°C | | | | | | | | | | | | | |
| TRME227*012#0035 | E | 220 | 12 | 85 | 8.4 | 125 | 19.8 | 6 | 35 | 2.777 | 2.500 | 1.111 | 3 |
| 16 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD476*016#0100 | D | 47 | 16 | 85 | 10 | 125 | 5.6 | 8 | 100 | 1.597 | 1.437 | 0.639 | 3 |
| TRME157*016#0030 | E | 150 | 16 | 85 | 10 | 125 | 18 | 6 | 30 | 3.000 | 2.700 | 1.200 | 3 |
| TRME157*016#0040 | E | 150 | 16 | 85 | 10 | 125 | 18 | 6 | 40 | 2.598 | 2.338 | 1.039 | 3 |
| TRMU227*016R0030 | U | 220 | 16 | 85 | 10 | 125 | 26.4 | 8 | 30 | 3.136 | 2.822 | 1.254 | 3 |
| TRMU227*016R0040 | U | 220 | 16 | 85 | 10 | 125 | 26.4 | 8 | 40 | 2.716 | 2.444 | 1.086 | 3 |
| 20 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD476*020#0055 | D | 47 | 20 | 85 | 13 | 125 | 7.1 | 8 | 55 | 2.153 | 1.938 | 0.861 | 3 |
| TRME107*020#0035 | E | 100 | 20 | 85 | 13 | 125 | 15 | 6 | 35 | 2.777 | 2.500 | 1.111 | 3 |
| TRME107*020#0045 | E | 100 | 20 | 85 | 13 | 125 | 15 | 6 | 45 | 2.449 | 2.205 | 0.980 | 3 |
| 25 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD336*025#0065 | D | 33 | 25 | 85 | 17 | 125 | 6.2 | 8 | 65 | 1.981 | 1.783 | 0.792 | 3 |
| TRME476*025#0065 | E | 47 | 25 | 85 | 17 | 125 | 8.8 | 6 | 65 | 2.038 | 1.834 | 0.815 | 3 |
| 35 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD106*035#0120 | D | 10 | 35 | 85 | 23 | 125 | 2.6 | 8 | 120 | 1.458 | 1.312 | 0.583 | 3 |
| TRMD226*035#0070 | D | 22 | 35 | 85 | 23 | 125 | 5.8 | 8 | 70 | 1.909 | 1.718 | 0.763 | 3 |
| TRME226*035#0060 | E | 22 | 35 | 85 | 23 | 125 | 5.8 | 6 | 60 | 2.121 | 1.909 | 0.849 | 3 |
| TRME226*035#0100 | E | 22 | 35 | 85 | 23 | 125 | 5.8 | 6 | 100 | 1.643 | 1.479 | 0.657 | 3 |
| TRME336*035#0050 | E | 33 | 35 | 85 | 23 | 125 | 8.7 | 6 | 50 | 2.324 | 2.091 | 0.930 | 3 |
| TRME336*035#0065 | E | 33 | 35 | 85 | 23 | 125 | 8.7 | 6 | 65 | 2.038 | 1.834 | 0.815 | 3 |
| 50 Volt @ 85°C | | | | | | | | | | | | | |
| TRMD475*050#0200 | D | 4.7 | 50 | 85 | 33 | 125 | 1.8 | 8 | 200 | 1.129 | 1.016 | 0.452 | 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 274.

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



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QUALIFICATION TABLE

| TEST | TRM professional multianode 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 $\leq 0.1\Omega/V$. Stabilize at room temperature for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Storage Life | Store at 125°C, no voltage applied, for 2000 hours. Stabilize at room temperature for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | 1.25 x initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ 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 | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ of initial value | | | | | | |
| | | | | DF | 1.2 x initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Biased Humidity | Apply rated voltage (Ur) at 85°C, 85% relative humidity for 1000 hours. Stabilize at room temperature and humidity for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | 2 x initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ 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 | DCL | IL* | n/a | IL* | 10 x IL* | 12.5 x IL* | IL* | |
| | 2 | -55 | 15 | $\Delta C/C$ | n/a | +0/-10% | $\pm 5\%$ | +10/-0% | +12/-0% | $\pm 5\%$ | |
| | 3 | +20 | 15 | DF | IL* | 1.5 x IL* | IL* | 1.5 x IL* | 2 x IL* | IL* | |
| | 4 | +85 | 15 | ESR | 1.25 x IL* | 2.5 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | |
| | 5 | +125 | 15 | | | | | | | | |
| | 6 | +20 | 15 | | | | | | | | |
| 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 1000 Ω | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Mechanical Shock | MIL-STD-202, Method 213, Condition F | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |
| Vibration | MIL-STD-202, Method 204, Condition D | | | Visual examination | no visible damage | | | | | | |
| | | | | DCL | initial limit | | | | | | |
| | | | | $\Delta C/C$ | within $\pm 5\%$ of initial value | | | | | | |
| | | | | DF | initial limit | | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | | |

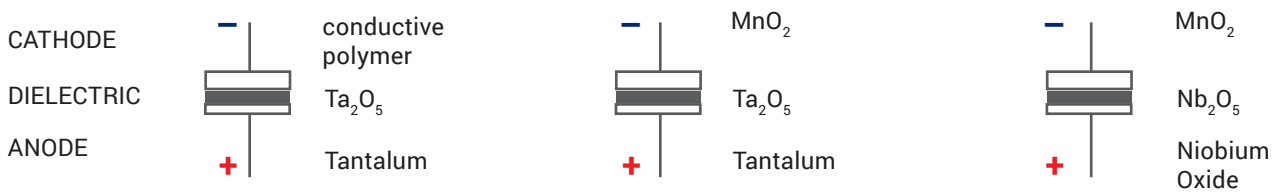
*Initial Limit

TRM Professional Multianode

Tantalum Ultra Low ESR Capacitor



AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP



FIVE CAPACITOR CONSTRUCTION STYLES



SERIES LINE UP: CONVENTIONAL SMD MnO₂



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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

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