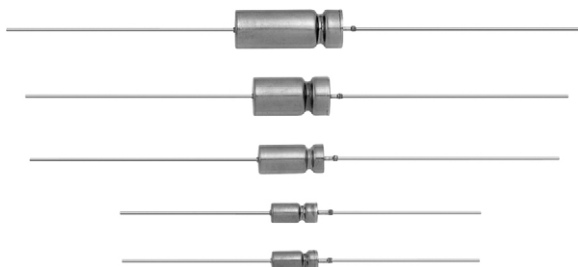


Wet Tantalum HI-TMP® Capacitors, Tantalum-Case With Glass-to-Tantalum Hermetic Seal for -40 °C to +230 °C Operation



LINKS TO ADDITIONAL RESOURCES



FEATURES

Vishay T11 HI-TMP® represents a major breakthrough in wet tantalum capacitor technology for high temperature (+230 °C) applications now being seen in the petroleum exploration industry. Its unique design provides for the highest capacitance per unit volume. The design facilitates a doubling of capacitance when compared with conventional wet tantalum products.

The T11 is housed in an unique all tantalum, hermetically sealed case and is manufactured to withstand high stress and hazardous environments.

- Axial terminations: standard tin / lead (SnPb)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details



PERFORMANCE CHARACTERISTICS

Operating Temperature: -40 °C to +85 °C
(to +230 °C with voltage derating)

Capacitance Tolerance: at 120 Hz, +25 °C; ± 20 % standard; ± 10 %

DC Leakage Current (DCL Max.): at +25 °C and above:
Leakage current shall not exceed the values listed in the Standard Ratings tables.

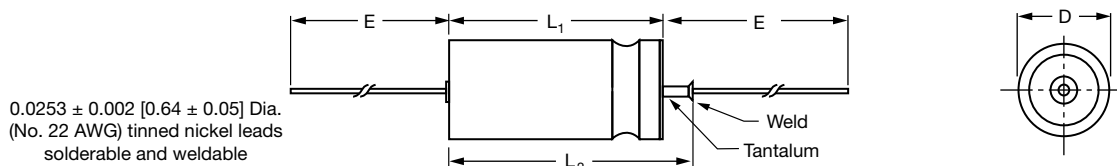
Life Test: capacitors are capable of withstanding a 300 h life test at a temperature of +230 °C at the applicable derated DC working voltage.

Capacitors are capable of withstanding a 500 h life test at a temperature of +220 °C at the applicable derated DC working voltage.

| ORDERING INFORMATION | | | | | | | | |
|----------------------|----------------------------------|---|--------------------------|---|--|-------------------|--|----------|
| T11 | C | 826 | M | 125 | B | Z | 6 | S |
| MODEL | CASE CODE | CAPACITANCE | CAPACITANCE TOLERANCE | DC VOLTAGE RATING AT +85 °C | TERMINATION AND PACKAGING | RELIABILITY LEVEL | STYLE NUMBER | ESR |
| | See Ratings and Case Codes table | This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow | K = ± 10 % M = ± 20 % | This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating | A = 100 % tin (RoHS compliant), bulk B = std., tin / lead, bulk | Z = non-ER | High temperature 8 = no outer insulating sleeve 6 = high temperature film insulation (above +125 °C) | S = std. |

Note

- Packaging: The use of formed plastic trays for packing bulk components is standard

DIMENSIONS in inches [millimeters]


| CASE CODE | | D | L ₁ | L ₂ (MAX.) | E | WEIGHT (g) (MAX.) |
|-------------|------|--------------------------------|--|--------------------------|---------------------------------|-------------------------|
| TYPE T11 | 134D | | | | | |
| A | T1 | 0.188 ± 0.016 [4.78 ± 0.41] | 0.453 + 0.031 - 0.016 [11.51 + 0.79 - 0.41] | 0.734 [18.64] | 1.500 ± 0.250 [38.10 ± 6.35] | 2.6 |
| B | T2 | 0.281 ± 0.016 [7.14 ± 0.41] | 0.641 + 0.031 - 0.016 [16.28 + 0.79 - 0.41] | 0.922 [23.42] | 2.250 ± 0.250 [57.15 ± 6.35] | 6.2 |
| C | T3 | 0.375 ± 0.016 [9.53 ± 0.41] | 0.766 + 0.031 - 0.016 [19.46 + 0.79 - 0.41] | 1.047 [26.59] | 2.250 ± 0.250 [57.15 ± 6.35] | 11.6 |
| D | T4 | 0.375 ± 0.016 [9.53 ± 0.41] | 1.062 + 0.031 - 0.016 [26.97 + 0.79 - 0.41] | 1.343 [34.11] | 2.250 ± 0.250 [57.15 ± 6.35] | 17.7 |

Note

- For insulated parts, add 0.007" [0.178] to the diameter. The insulation shall lap over the ends of the capacitor body

RATINGS AND CASE CODES

| μF | 50 V | 60 V | 75 V | 100 V | 125 V |
|-----|------|------|------|-------|-------|
| 47 | | | | | B |
| 68 | | | | B | |
| 110 | | | B | | |
| 150 | | B | | | |
| 220 | B | | | | |

STANDARD RATINGS

| CAPACITANCE AT 25 °C 120 Hz (μF) | CASE CODE | PART NUMBER | MAX. 120 Hz ESR (Ω) | MAX. DCL AT 25 °C (μA) | MAX. DCL AT 85 °C AND 125 °C (μA) | MAX. IMP. AT -25 °C (Ω) | MAX. ΔCAP. AT -25 °C (%) | TYP. ΔCAP. AT +85 °C (%) | TYP. ΔCAP. AT +125 °C (%) | AC RIPPLE 85 °C 40 kHz (mA) RMS |
|--|--------------|---------------------------|------------------------------|------------------------------------|---|-------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|--|
| 50 V _{DC} AT 85 °C; 30 V _{DC} AT 125 °C; 25 V _{DC} AT 230 °C | | | | | | | | | | |
| 220 | B | T11B227(1)050(2)(3)(4)(5) | 0.90 | 2 | 10 | 9 | -15 | 13 | 50 | 2300 |
| 60 V _{DC} AT 85 °C; 40 V _{DC} AT 125 °C; 30 V _{DC} AT 230 °C | | | | | | | | | | |
| 150 | B | T11B157(1)060(2)(3)(4)(5) | 1.10 | 2 | 10 | 13 | -11 | 10 | 30 | 2050 |
| 75 V _{DC} AT 85 °C; 50 V _{DC} AT 125 °C; 36 V _{DC} AT 230 °C | | | | | | | | | | |
| 110 | B | T11B117(1)075(2)(3)(4)(5) | 1.30 | 2 | 10 | 16 | -8 | 8 | 30 | 1900 |
| 100 V _{DC} AT 85 °C; 65 V _{DC} AT 125 °C; 50 V _{DC} AT 230 °C | | | | | | | | | | |
| 68 | B | T11B686(1)100(2)(3)(4)(5) | 2.10 | 2 | 10 | 25 | -6 | 8 | 25 | 1500 |
| 125 V _{DC} AT 85 °C; 85 V _{DC} AT 125 °C; 62 V _{DC} AT 230 °C | | | | | | | | | | |
| 47 | B | T11B476(1)125(2)(3)(4)(5) | 2.30 | 2 | 10 | 35 | -5 | 7 | 20 | 1450 |

Note

- Part number definitions:
 - Capacitance tolerance: K, M
 - Termination / packaging: A = 100 % tin, bulk; B = std., tin / lead, bulk
 - Reliability level: Z = non-ER
 - Style number: 6 = high temperature film insulation; 8 = no insulating sleeve
 - ESR: S = std.

**TYPICAL PERFORMANCE CHARACTERISTICS OF T11 CAPACITORS**

| ELECTRICAL CHARACTERISTICS | |
|-----------------------------------|--|
| ITEM | PERFORMANCE CHARACTERISTICS |
| Operating temperature range | -40 °C to +85 °C (to +230 °C with voltage derating) |
| Capacitor tolerance | ± 20 %, ± 10 % at 120 Hz, at +25 °C |
| Capacitor change by temperature | Limit per Standard Ratings table |
| ESR | Limit per Standard Ratings table, at +25 °C, 120 Hz |
| Impedance | Limit per Standard Ratings table, at -55 °C, 120 Hz |
| DCL (leakage current) | Limit per Standard Ratings table |
| AC ripple current | Limit per Standard Ratings table, at +85 °C and 40 kHz |
| Reverse voltage | None |
| Surge voltage | Surge voltage shall be in accordance with MIL-PRF-39006 and Table 2 of DSCC93026. The DC rated surge voltage is the maximum voltage to which the capacitors can be subjected under any conditions including transients and peak ripple at the highest line voltage. The DC surge voltage is 115 % of rated DC voltage. |

| PERFORMANCE CHARACTERISTICS | |
|------------------------------------|--|
| ITEM | PERFORMANCE CHARACTERISTICS |
| Life testing | Capacitors are capable of withstanding a 300 h life test at a temperature of +230 °C at the applicable derated DC working voltage. Capacitors are capable of withstanding a 500 h life test at a temperature of +220 °C at the applicable derated DC working voltage. |

| ENVIRONMENTAL CHARACTERISTICS | | |
|--------------------------------------|--------------------------------------|--|
| ITEM | CONDITION | COMMENTS |
| Seal | MIL-PRF-39006 | When the capacitors are tested as specified in MIL-PRF-39006, there shall be no evidence of leakage. |
| Moisture resistance | MIL-PRF-39006 | Moisture resistance shall be in accordance with MIL-PRF-39006. Number of cycles: 10 continuous cycles |
| Barometric pressure (reduced) | MIL-STD-202, method 105, condition E | Altitude 150 000 feet |

| MECHANICAL CHARACTERISTICS | | |
|-----------------------------------|-------------------------|---|
| ITEM | TEST METHOD | CONDITION |
| Shock (specified pulse) | MIL-STD-202, method 213 | Test condition I (100 g) |
| Vibration, high frequency | MIL-STD-202, method 204 | Test condition D (20 g peak) |
| Thermal shock | MIL-STD-202, method 107 | Test condition A, 30 cycles |
| Solderability | MIL-STD-202, method 208 | ANSI/J-STD-002, test A Solderability shall be in accordance with MIL-PRF-39006. |
| Terminal strength | MIL-STD-202, method 211 | Terminal strength shall be in accordance with MIL-PRF-39006. |
| Resistance to solder heat | MIL-STD-202, method 210 | Test condition C The capacitors shall meet the requirements of MIL-PRF-39006. |
| Terminals | MIL-STD-1276 | Terminals shall be as specified in MIL-STD-1276. The length and diameter of the terminals shall be as specified in Dimensions table. All terminals shall be permanently secured internally and externally, as applicable. All external joints shall be welded. |
| Marking | MIL-STD-1285 | Marking of capacitors conforms to method I of MIL-STD-1285 and include capacitance (in μF), capacitance tolerance letter, rated voltage, date code, lot symbol, and Vishay trademark. |

| SELECTOR GUIDES | |
|----------------------------|--|
| Tantalum Selector Guide | www.vishay.com/doc?49054 |
| Parameter Comparison Guide | www.vishay.com/doc?42088 |



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