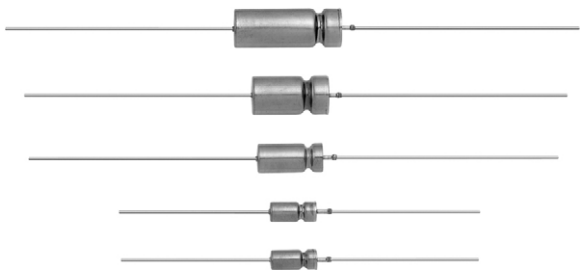
Wet Tantalum HI-TMP® Capacitors, Tantalum-Case With Glass-to-Tantalum Hermetic Seal for -40 °C to +230 °C Operation



FEATURES

Pb-free Available

RoHS* Available

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

LINKS TO ADDITIONAL RESOURCES

3D Models

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

For technical questions, contact: tantalum@vishay.com

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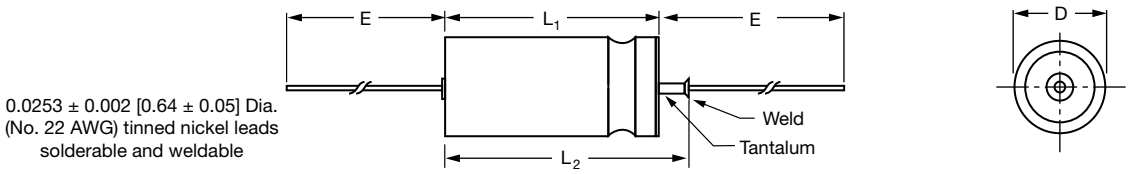
DIMENSIONS in inches [millimeters]



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

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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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