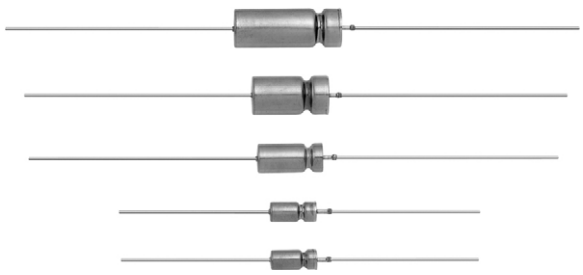
Wet Tantalum HI-TMP® Capacitors, Tantalum-Case With Glass-to-Tantalum Hermetic Seal for -40 °C to +230 °C Operation



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.

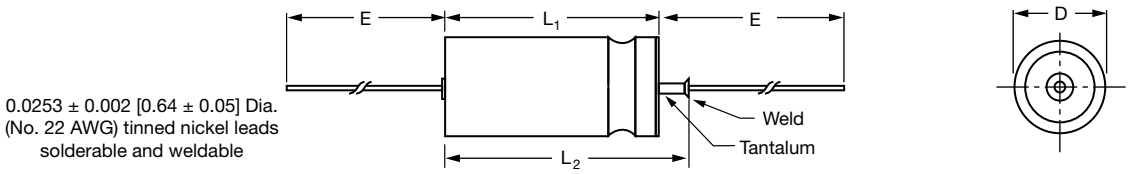
ORDERING INFORMATION

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

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

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.

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	**CONDITION**	**COMMENTS**
Shock (specified pulse)	MIL-STD-202, method 213, condition I (100 *g*)	The capacitors shall meet the requirements of MIL-PRF-39006.
Vibration, high frequency	MIL-STD-202, method 204, condition D (20 *g* peak)	The capacitors shall meet the requirements of MIL-PRF-39006.
Thermal shock	MIL-STD-202, method 107, condition A	Thermal shock shall be in accordance with MIL-PRF-39006 when tested for 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, 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

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.