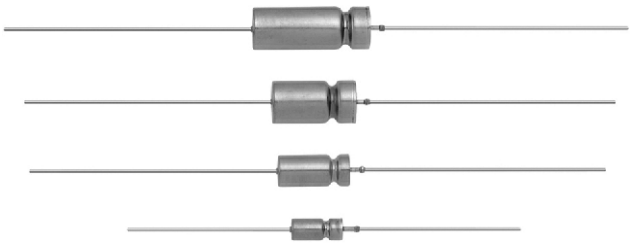
Wet Tantalum Capacitors, Extended Capacitance, Tantalum Case with Glass-to-Tantalum Hermetic Seal for -55 °C to +125 °C



PERFORMANCE CHARACTERISTICS

Refer to: Typical Performance Characteristics

Operating Temperature: -55 °C to +85 °C
(to +125 °C with voltage derating)

Capacitance Tolerance: ± 10 %, ± 20 % standard

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

FEATURES

- Enhanced performance, high reliability design
- Terminations: axial, standard tin / lead (Sn / Pb), 100 % tin (RoHS-compliant) available
- Model T16 tantalum-case electrolytic capacitors provide all the advantages of Vishay's SuperTan® series devices, while offering improved reverse voltage and vibration capability
- Increased thermal shock capability of 300 cycles
- Designed for the avionics and aerospace applications
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available
RoHS* Available
HALOGEN FREE GREEN (5-2008) Available

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.

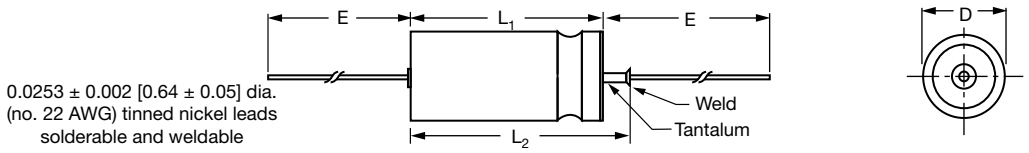
ORDERING INFORMATION

T16	D	227	M	100	E	Z	S	S
MODEL	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT +85 °C	TERMINATION AND PACKAGING	RELIABILITY LEVEL	INSULATING SLEEVE	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.	E = tin / lead, bulk, standard C = 100 % tin, bulk	Z = non-ER	S = sleeved U = unsleeved	S = std.

Note

- Packaging: the use of formed plastic trays for packaging these axial lead components is standard. Tape and reel is not available due to the unit weight.

DIMENSIONS in inches [millimeters]



CASE CODE		D	L_1	L_2 (max.)	E	WEIGHT (g) (max.)
TYPE T16	ST					
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 [9.52 ± 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 [9.52 ± 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 0.015" [0.38 mm] 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. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%)			AC RIPPLE +85 °C 40 kHz (mA_{RMS})
					+25 °C	+85 °C AND +125 °C	-55 °C	+85 °C	+125 °C	
25 V_{DC} AT 85 °C, 15 V_{DC} AT 125 °C										
120	A	T16A127(1)025(2)(3)(4)(5)	1.30	25	1	5	-42	8	12	1250
560	B	T16B567(1)025(2)(3)(4)(5)	0.83	12	2	10	-65	14	18	2000
1200	C	T16C128(1)025(2)(3)(4)(5)	0.65	7	5	20	-70	15	20	2400
1800	D	T16D188(1)025(2)(3)(4)(5)	0.50	7	6	25	-72	15	20	3000
30 V_{DC} AT 85 °C, 20 V_{DC} AT 125 °C										
100	A	T16A107(1)030(2)(3)(4)(5)	1.30	25	1	5	-38	8	12	1200
470	B	T16B477(1)030(2)(3)(4)(5)	0.85	15	2	10	-65	14	18	1800
1000	C	T16C108(1)030(2)(3)(4)(5)	0.70	7	7	25	-70	15	25	2200
1500	D	T16D158(1)030(2)(3)(4)(5)	0.60	6	12	35	-72	15	25	2900
50 V_{DC} AT 85 °C, 30 V_{DC} AT 125 °C										
68	A	T16A686(1)050(2)(3)(4)(5)	1.50	35	1	5	-25	8	15	1050
220	B	T16B227(1)050(2)(3)(4)(5)	0.90	17.5	2	10	-50	8	15	1800
470	C	T16C477(1)050(2)(3)(4)(5)	0.75	10	3	25	-45	8	15	2100
680	D	T16D687(1)050(2)(3)(4)(5)	0.70	8	5	40	-58	10	20	2700
60 V_{DC} AT 85 °C, 40 V_{DC} AT 125 °C										
47	A	T16A476(1)060(2)(3)(4)(5)	2.00	44	1	5	-25	8	12	1050
150	B	T16B157(1)060(2)(3)(4)(5)	1.10	20	2	10	-40	8	15	1800
390	C	T16C397(1)060(2)(3)(4)(5)	0.90	15	3	25	-45	8	15	2100
560	D	T16D567(1)060(2)(3)(4)(5)	0.80	10	5	40	-58	8	15	2700
75 V_{DC} AT 85 °C, 50 V_{DC} AT 125 °C										
33	A	T16A336(1)075(2)(3)(4)(5)	2.50	66	1	5	-25	5	9	1050
110	B	T16B117(1)075(2)(3)(4)(5)	1.30	24	2	10	-35	6	10	1650
330	C	T16C337(1)075(2)(3)(4)(5)	1.00	12	3	30	-45	6	10	2100
470	D	T16D477(1)075(2)(3)(4)(5)	0.90	12	5	50	-50	6	10	2700
100 V_{DC} AT 85 °C, 65 V_{DC} AT 125 °C										
15	A	T16A156(1)100(2)(3)(4)(5)	3.50	125	1	5	-18	3	10	1050
68	B	T16B686(1)100(2)(3)(4)(5)	2.10	37	2	10	-30	4	12	1650
150	C	T16C157(1)100(2)(3)(4)(5)	1.60	22	3	25	-35	6	12	2100
220	D	T16D227(1)100(2)(3)(4)(5)	1.20	15	5	50	-40	6	12	2700
125 V_{DC} AT 85 °C, 85 V_{DC} AT 125 °C										
10	A	T16A106(1)125(2)(3)(4)(5)	5.50	175	1	5	-15	3	10	1050
47	B	T16B476(1)125(2)(3)(4)(5)	2.30	47	2	10	-25	5	12	1650
82	C	T16C826(1)125(2)(3)(4)(5)	1.80	40	3	25	-35	5	12	1950
100	C	T16C107(1)125(2)(3)(4)(5)	1.80	35	3	25	-35	5	12	2100
150	D	T16D157(1)125(2)(3)(4)(5)	1.60	20	5	50	-35	6	12	2700

Note

- Part number definitions:
  (1) Capacitance tolerance: K, M
  (2) Termination / packaging: C = 100 % tin, bulk, E = std., tin / lead, bulk
  (3) Reliability level: Z = non-ER
  (4) Insulating sleeve: S = sleeved; U = unsleeved
  (5) ESR: S = std.

TYPICAL PERFORMANCE CHARACTERISTICS OF T16 CAPACITORS

ELECTRICAL CHARACTERISTICS	
ITEM	**PERFORMANCE CHARACTERISTICS**
Operating temperature range	-55 °C to +85 °C (to +125 °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	Reverse voltage shall be in accordance with MIL-PRF-39006, paragraphs 3.23 and 4.8.19, except DC potential will be maximum of 1.5 V.
Surge voltage	Surge voltage shall be in accordance with MIL-PRF-39006 and Table II 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 shall be capable of withstanding a 2000 h life test at a temperature +85 °C at rated voltage, or a 2000 h life test at 125 °C test at derated voltage. After the test, the capacitors shall meet the following requirements: a) DC leakage at 85 °C and 125 °C shall not exceed 125 % of the specified value b) DC leakage at 25 °C shall not exceed the specified value c) Capacitance shall be within +10 %, -20 % of initial value d) ESR shall not exceed 200 % of the specified value

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 D (500 *g*)	The capacitors shall meet the requirements of MIL-PRF-39006.
Vibration, high frequency	MIL-STD-202, method 204, condition E (50 *g* peak)	The capacitors shall meet the requirements of MIL-PRF-39006.
Random vibration	MIL-STD-202, method 214, condition II-G (overall RMS 27.78 *g*)	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 300 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.

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.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

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

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9