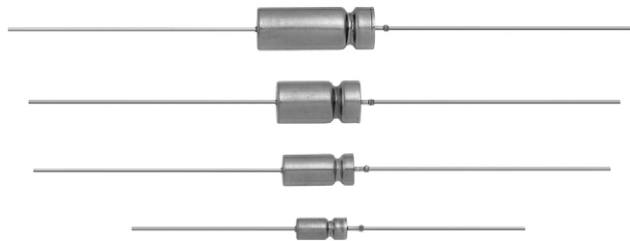




# Wet Tantalum Capacitors, Extended Capacitance, Tantalum Case With Glass-to-Tantalum Hermetic Seal for -55 °C to +125 °C, DLA Approved



### FEATURES

- Enhanced performance, high reliability design
- Terminations: axial, standard tin / lead (Sn / Pb) plated
- The 13017 tantalum-case electrolytic capacitors provide all the advantages of Vishay's SuperTan® series devices, while offering improved reverse voltage and vibration capabilities
- Increased thermal shock capability of 300 cycles
- Designed for the avionics and aerospace applications

### LINKS TO ADDITIONAL RESOURCES



### PERFORMANCE CHARACTERISTICS

Refer to: Typical Performance Characteristics

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

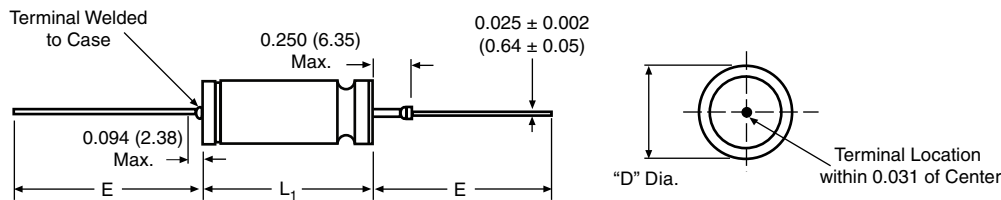
**Capacitance Tolerance:** ± 10 %, ± 20 % standard

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

ORDERING INFORMATION			
13017 DLA DRAWING NUMBER	-01 DASH NUMBER	K CAPACITANCE TOLERANCE	S
		K = ± 10 % M = ± 20 %	S = sleeved U = unsleeved

DLA LAND AND MARITIME COLUMBUS, OHIO	Drawing no. 13017
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### DIMENSIONS in inches [millimeters]



CASE CODE	D ± 0.016 [0.41]	D MAX. INSULATED (DIA.)	L <sub>1</sub> UNINSULATED + 0.031 [0.79] - 0.016 [0.41]	E ± 0.250 [6.35] MAX.
T1	0.188 [4.78]	0.219 [5.56]	0.453 [11.51]	1.500 [38.10]
T2	0.281 [7.14]	0.312 [7.92]	0.641 [16.28]	2.250 [57.15]
T3	0.375 [9.52]	0.406 [10.31]	0.766 [19.46]	2.250 [57.15]
T4	0.375 [9.52]	0.406 [10.31]	1.062 [26.97]	2.250 [57.15]

### Note

- Insulation sleeving will lap over the ends of the capacitor body



STANDARD RATINGS											
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER	MAX. ESR	MAX. IMP.	MAX. DCL		MAX. CAPACITANCE			AC RIPPLE +85 °C 40 kHz (mA <sub>RMS</sub> )	
			AT +25 °C 120 Hz ( $\Omega$ )	AT -55 °C 120 Hz ( $\Omega$ )	( $\mu$ A)	+25 °C	+85 °C AND +125 °C	-55 °C	+85 °C		+125 °C
<b>25 V<sub>DC</sub> AT 85 °C, 15 V<sub>DC</sub> AT 125 °C</b>											
120	T1	13017-01(1)(2)	1.30	25	1	5	-42	8	12	1250	
560	T2	13017-02(1)(2)	0.83	12	2	10	-65	14	18	2000	
1200	T3	13017-03(1)(2)	0.65	7	5	20	-70	15	20	2400	
1800	T4	13017-04(1)(2)	0.50	7	6	25	-72	15	20	3000	
<b>30 V<sub>DC</sub> AT 85 °C, 20 V<sub>DC</sub> AT 125 °C</b>											
100	T1	13017-05(1)(2)	1.30	25	1	5	-38	8	12	1200	
470	T2	13017-06(1)(2)	0.85	15	2	10	-65	14	18	1800	
1000	T3	13017-07(1)(2)	0.70	7	7	25	-70	15	25	2200	
1500	T4	13017-08(1)(2)	0.60	6	12	35	-72	15	25	2900	
<b>50 V<sub>DC</sub> AT 85 °C, 30 V<sub>DC</sub> AT 125 °C</b>											
68	T1	13017-09(1)(2)	1.50	35	1	5	-25	8	15	1050	
220	T2	13017-10(1)(2)	0.90	17.5	2	10	-50	8	15	1800	
470	T3	13017-11(1)(2)	0.75	10	3	25	-45	8	15	2100	
680	T4	13017-12(1)(2)	0.70	8	5	40	-58	10	20	2700	
<b>60 V<sub>DC</sub> AT 85 °C, 40 V<sub>DC</sub> AT 125 °C</b>											
47	T1	13017-13(1)(2)	2.00	44	1	5	-25	8	12	1050	
150	T2	13017-14(1)(2)	1.10	20	2	10	-40	8	15	1800	
390	T3	13017-15(1)(2)	0.90	15	3	25	-45	8	15	2100	
560	T4	13017-16(1)(2)	0.80	10	5	40	-58	8	15	2700	
<b>75 V<sub>DC</sub> AT 85 °C, 50 V<sub>DC</sub> AT 125 °C</b>											
33	T1	13017-17(1)(2)	2.50	66	1	5	-25	5	9	1050	
110	T2	13017-18(1)(2)	1.30	24	2	10	-35	6	10	1650	
330	T3	13017-19(1)(2)	1.00	12	3	30	-45	6	10	2100	
470	T4	13017-20(1)(2)	0.90	12	5	50	-50	6	10	2700	
<b>100 V<sub>DC</sub> AT 85 °C, 65 V<sub>DC</sub> AT 125 °C</b>											
15	T1	13017-21(1)(2)	3.50	125	1	5	-18	3	10	1050	
68	T2	13017-22(1)(2)	2.10	37	2	10	-30	4	12	1650	
150	T3	13017-23(1)(2)	1.60	22	3	25	-35	6	12	2100	
220	T4	13017-24(1)(2)	1.20	15	5	50	-40	6	12	2700	
<b>125 V<sub>DC</sub> AT 85 °C, 85 V<sub>DC</sub> AT 125 °C</b>											
10	T1	13017-25(1)(2)	5.50	175	1	5	-15	3	10	1050	
47	T2	13017-26(1)(2)	2.30	47	2	10	-25	5	12	1650	
82	T3	13017-27(1)(2)	1.80	40	3	25	-35	5	12	1950	
100	T3	13017-28(1)(2)	1.80	35	3	25	-35	5	12	2100	
150	T4	13017-29(1)(2)	1.60	20	5	50	-35	6	12	2700	

**Note**

- Part number definitions:
  - Capacitance tolerance: K = 10 %, M = 20 %
  - Case or body insulation: S = sleeved; U = unsleeved

RIPPLE CURRENT MULTIPLIERS VS. FREQUENCY, TEMPERATURE, AND APPLIES PEAK VOLTAGE																									
FREQUENCY OF APPLIED RIPPLE CURRENT		120 Hz				800 Hz				1 kHz				10 kHz				40 kHz				100 kHz			
		≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125
% of 85 °C rated peak voltage	100 %	0.60	0.39	-	-	0.71	0.43	-	-	0.72	0.46	-	-	0.88	0.55	-	-	1.0	0.63	-	-	1.1	0.69	-	-
	90 %	0.60	0.46	-	-	0.71	0.55	-	-	0.72	0.55	-	-	0.88	0.67	-	-	1.0	0.77	-	-	1.1	0.85	-	-
	80 %	0.60	0.52	0.35	-	0.71	0.62	0.42	-	0.72	0.62	0.42	-	0.88	0.76	0.52	-	1.0	0.87	0.59	-	1.1	0.96	0.65	-
	70 %	0.60	0.58	0.44	-	0.71	0.69	0.52	-	0.72	0.70	0.52	-	0.88	0.85	0.64	-	1.0	0.97	0.73	-	1.1	1.07	0.80	-
	66 2/3 %	0.60	0.60	0.46	0.27	0.71	0.71	0.55	0.32	0.72	0.72	0.55	0.32	0.88	0.88	0.68	0.40	1.0	1.0	0.77	0.45	1.1	1.1	0.85	0.50



TYPICAL PERFORMANCE CHARACTERISTICS OF DLA 13017 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
Surge voltage	Surge voltage shall be in accordance with MIL-PRF-39006 and DLA13017. 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 1000 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



<b>MECHANICAL CHARACTERISTICS</b>		
<b>ITEM</b>	<b>CONDITION</b>	<b>COMMENTS</b>
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 $\mu\text{F}$ ), capacitance tolerance letter, rated voltage, date code, lot symbol and Vishay trademark.

<b>SELECTOR GUIDES</b>	
Tantalum Selector Guide	<a href="http://www.vishay.com/doc?49054">www.vishay.com/doc?49054</a>
Parameter Comparison Guide	<a href="http://www.vishay.com/doc?42088">www.vishay.com/doc?42088</a>



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