SuperTan® Wet Tantalum Capacitors with Hermetic Seal



FEATURES

- Very high capacitance
- 10 µF to 1800 µF
- 25 V_{DC} to 125 V_{DC}
- Very low ESR
- High ripple current
- All Tantalum case
- Hermetically sealed
- Low DCL
- Axial through-hole terminations: Standard tin/lead (Sn/Pb) 100 % tin (RoHS compliant) available
- Compliant to RoHS Directive 2002/95/EC

Pb-free Available

RoHS* COMPLIANT

Note

* Pb containing terminations are not RoHS compliant, exemptions may apply

Vishay ST represents a major breakthrough in wet tantalum capacitor technology. Its unique cathode system provides the highest capacitance per unit volume. The design facilitates a doubling of capacitance, lower ESR and higher ripple current rating compared with conventional wet tantalum products. Moreover, the ST has the capacitance stability of a solid tantalum capacitor and there are no circuit impedance restrictions.

The ST is housed in an all tantalum, hermetically sealed case and is manufactured to withstand hazardous environments. The ST is used widely in the defense and aerospace industries and whenever there is a space problem.

PERFORMANCE CHARACTERISTICS

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

Capacitance Tolerance: At 120 Hz, + 25 °C. ± 20 % standard. ± 10 % available as special.

APPLICATION NOTES

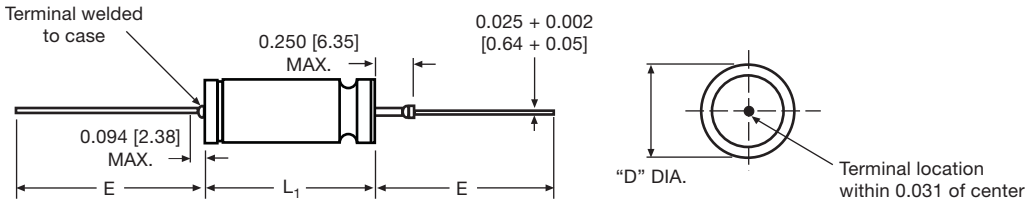
a. No continuous reverse voltage permissible.

b. The peak of the applied AC ripple and the applied DC voltage must not exceed the DC voltage rating of the capacitor.

c. Ripple current ratings by part number at 85 °C and 40 kHz are included in the table. Ripple current correction factors for other temperatures and frequencies are given on the next page.

d. Transient reverse voltage surges are acceptable under the following conditions:
The peak reverse voltage does not exceed 1.5 V and the peak current times the duration of the reverse transient does not exceed 0.05 As. In addition, the repetition frequency of the reverse voltage surge is less than 10 Hz.

DIMENSIONS in inches [millimeters]



CASE CODE	D ± 0.016 [0.41]	MAX. INSULATED (DIA.)	L_1 + 0.031 [0.79] UNINSULATED	E ± 0.250 [6.3] 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]
L2	0.281 [7.14]	0.312 [7.92]	1.008 [25.60]	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]

Notes

- Material at egress is Tantalum
- Insulation sleeving will lap over the ends of the capacitor case
- Tinned nickel leads, solderable and weldable
- Approx. weight:
T1: 2.3 g, T2: 5.7 g,
T3: 9.4 g, T4: 14.8 g

For technical questions, contact: tantalum@vishay.com

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ORDERING INFORMATION

ST	220	100	T4	M	I	E3
Super Tan® COMMERCIAL CAP. TYPE	CAPACITANCE µF	85 °C RATED DC VOLTAGE	CASE CODE	CAPACITANCE TOLERANCE	INSULATING SLEEVE	RoHS compliant
				M = ± 20 % K = ± 10 %	I = Insulated X = Uninsulated	E3 = 100 % tin termination (RoHS compliant) Blank = SnPb termination (standard design)

STANDARD RATINGS

CAPACITANCE AT 25 °C AND 120 Hz (µF)	CASE CODE	MAX. ESR 120 Hz (Ω)	MAX. DCL AT + 25 °C (µA)	MAX. DCL AT + 85 °C/ + 125 °C (µA)	MAX. IMP. AT - 55 °C AND 120 Hz (Ω)	MAX. CAPACITANCE CHANGE AT - 55 °C (%)	MAX. CAPACITANCE CHANGE AT + 85 °C (%)	MAX. CAPACITANCE CHANGE AT + 125 °C (%)	AC RIPPLE 85 °C 40 kHz (mA) RMS	PART NUMBER
25 V_{DC} AT 85 °C; 15 V_{DC} AT 125 °C										
120	T1	1.3	1	5	25	- 42	+ 8	+ 12	1250	ST120-25T1MI
560	T2	0.83	2	10	12	- 65	+ 10	+ 15	2100	ST560-25T2MI
1100	L2	0.5	3	25	7	- 60	+ 20	+ 45	3200	ST1100-25L2MI
1200	T3	0.65	5	20	7	- 70	+ 12	+ 18	2600	ST1200-25T3MI
1800	T4	0.5	6	25	7	- 72	+ 12	+ 20	3100	ST1800-25T4MI
30 V_{DC} AT 85 °C; 20 V_{DC} AT 125 °C										
100	T1	1.3	1	5	25	- 38	+ 8	+ 12	1200	ST100-30TMI
470	T2	0.85	2	10	15	- 65	+ 10	+ 18	1800	ST470-30T2MI
950	L2	0.5	5	30	7	- 55	+ 18	+ 35	3200	ST950-30L2MI
1000	T3	0.7	7	25	7	- 70	+ 10	+ 18	2500	ST1000-30T3MI
1500	T4	0.6	12	35	6	- 72	+ 10	+ 20	3000	ST1500-30T4MI
50 V_{DC} AT 85 °C; 30 V_{DC} AT 125 °C										
68	T1	1.5	1	5	35	- 25	+ 8	+ 15	1050	ST68-50T1MI
220	T2	0.9	2	10	17.5	- 50	+ 8	+ 15	1800	ST220-50T2MI
450	L2	0.6	3	25	7.5	- 45	+ 12	+ 30	2900	ST450-50L2MI
470	T3	0.75	3	25	10	- 45	+ 8	+ 15	2100	ST470-50T3MI
680	T4	0.7	5	40	8	- 58	+ 10	+ 20	2750	ST680-50T4MI
60 V_{DC} AT 85 °C; 40 V_{DC} AT 125 °C										
47	T1	2.0	1	5	44	- 25	+ 8	+ 12	1050	ST47-60T1MI
150	T2	1.1	2	10	20	- 40	+ 8	+ 15	1800	ST150-60T2MI
370	L2	0.6	3	25	9	- 33	+ 9	+ 20	2900	ST370-60L2MI
390	T3	0.9	3	25	15	- 45	+ 8	+ 15	2100	ST390-60T3MI
560	T4	0.8	5	40	10	- 58	+ 8	+ 15	2750	ST560-60T4MI
75 V_{DC} AT 85 °C; 50 V_{DC} AT 125 °C										
33	T1	2.5	1	5	66	- 25	+ 5	+ 9	1050	ST33-75T1MI
110	T2	1.3	2	10	24	- 35	+ 6	+ 10	1650	ST110-75T2MI
250	L2	0.8	5	30	12	- 30	+ 6	+ 15	2500	ST250-75L2MI
330	T3	1.0	3	30	12	- 45	+ 6	+ 10	2100	ST330-75T3MI
470	T4	0.9	5	50	12	- 50	+ 6	+ 10	2750	ST470-75T4MI

Notes

- (K = ± 10 %, M = ± 20 %) and insulation letter (I =Insulation, X = Uninsulated)
- Part numbers shown are for units with ± 20 % capacitance tolerance and uninsulated capacitors. For ± 10 units, change the digit following the letter “X” from “0” to “9”. For units with outer plastic-film insulation, substitute “2” for “0” at the end of the part number
- For RoHS compliant add “E3” for suffix

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STANDARD RATINGS

CAPACITANCE AT 25 °C AND 120 Hz (µF)	CASE CODE	MAX. ESR 120 Hz (Ω)	MAX. DCL AT		MAX. IMP. AT - 55 °C AND 120 Hz (Ω)	MAX. CAPACITANCE CHANGE AT			AC RIPPLE 85 °C 40 kHz (mA) RMS	PART NUMBER
			+ 25 °C (µA)	+ 85 °C/ + 125 °C (µA)		- 55 °C (%)	+ 85 °C (%)	+ 125 °C (%)		
100 V_{DC} AT 85 °C; 65 V_{DC} AT 125 °C										
15	T1	3.5	1	5	125	- 18	+ 3	+ 10	1050	ST15-100T1MI
68	T2	2.1	2	10	37	- 30	+ 4	+ 12	1650	ST68-100T2MI
120	L2	1.0	3	25	20.5	- 30	+ 4	+ 12	2200	ST120-100L2MI
150	T3	1.6	3	25	22	- 35	+ 6	+ 12	2100	ST150-100T3MI
220	T4	1.2	5	50	15	- 40	+ 6	+ 12	2750	ST220-100T4MI
125 V_{DC} AT 85 °C; 85 V_{DC} AT 125 °C										
10	T1	5.5	1	5	175	- 15	+ 3	+ 10	1050	ST10-125T1MI
47	T2	2.3	2	10	47	- 25	+ 5	+ 12	1650	ST47-125T2MI
90	L2	1.3	5	25	25	- 22	+ 4	+ 15	2000	ST90-125L2MI
82	T3	1.8	3	25	40	- 35	+ 5	+ 12	1950	ST82-125T3MI
100	T3	1.8	3	25	35	- 35	+ 5	+ 12	2100	ST100-125T3MI
150	T4	1.6	5	50	20	- 35	+ 6	+ 12	2750	ST150-125T4MI

Notes

- (K = ± 10 %, M = ± 20 %) and insulation letter (I =Insulation, X = Uninsulated)
- Part numbers shown are for units with ± 20 % capacitance tolerance and uninsulated capacitors. For ± 10 units, change the digit following the letter “X” from “0” to “9”. For units with outer plastic-film insulation, substitute “2” for “0” at the end of the part number
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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			
AMBIENT STILL AIR TEMP. IN °C		≤ 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

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