

Solid Tantalum Chip Capacitors

Tantamount® Hi-Rel COTS, Molded Case



FEATURES

- Terminations: SnPb, Standard. 100 % Tin available.
- Molded case available in five case codes.
- Compatible with "High Volume" automatic pick and place equipment.
- High Ripple Current carrying capability.
- Standard and Low ESR options.
- Compliant Terminations.



RoHS*
COMPLIANT

PERFORMANCE/ELECTRICAL CHARACTERISTICS

Operating Temperature: - 55 °C to + 85 °C

(To + 125 °C with voltage derating)

Capacitance Range: 0.1 µF to 330 µF

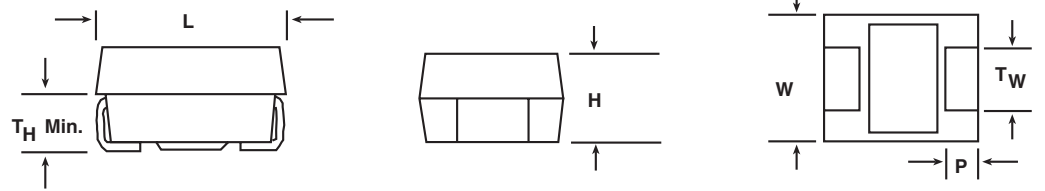
Capacitance Tolerance: ± 20 %, ± 10 % standard

Voltage Rating: 4 WVDC to 50 WVDC

ORDERING INFORMATION

T83	D	107	K	010	E	A	A	S
TYPE	CASE CODE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	TERMINATION AND PACKAGING	RELIABILITY LEVEL	SURGE CURRENT	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 decimal point is indicated by an "R" (6R3 = 6.3 volts).	E: Sn/Pb Solder/7" (178 mm) reels F: Sn/Pb Solder/13" (330 mm) reels C: 100% Tin/7" (178 mm) reels D: 100% Tin/13" (330 mm) reels	A = 1.0 % B = 0.1 % C = 0.01 % S = Hi-Rel Standard Z = Non-ER	A = 10 cycles at + 25 °C B = 10 cycles at - 55 °C/+ 85 °C S = 3 cycles at + 25 °C Z = None	S = Std L = Low

DIMENSIONS in inches [millimeters]

							
CASE CODE	EIA SIZE	L	W	H	P	T _W	T _H (Min.)
A	3216-18	0.126 ± 0.008 [3.2 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.063 ± 0.008 [1.6 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.047 ± 0.004 [1.2 ± 0.10]	0.028 [0.70]
B	3528-21	0.138 ± 0.008 [3.5 ± 0.20]	0.110 ± 0.008 [2.8 ± 0.20]	0.075 ± 0.008 [1.9 ± 0.20]	0.031 ± 0.012 [0.80 ± 0.30]	0.087 ± 0.004 [2.2 ± 0.10]	0.028 [0.70]
C	6032-28	0.236 ± 0.012 [6.0 ± 0.30]	0.126 ± 0.012 [3.2 ± 0.30]	0.098 ± 0.012 [2.5 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.087 ± 0.004 [2.2 ± 0.10]	0.039 [1.0]
D	7343-31	0.287 ± 0.012 [7.3 ± 0.30]	0.170 ± 0.012 [4.3 ± 0.30]	0.110 ± 0.012 [2.8 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.095 ± 0.004 [2.4 ± 0.10]	0.039 [1.0]
E	7343-43	0.287 ± 0.012 [7.3 ± 0.30]	0.170 ± 0.012 [4.3 ± 0.30]	0.158 ± 0.012 [4.0 ± 0.30]	0.051 ± 0.012 [1.3 ± 0.30]	0.095 ± 0.004 [2.4 ± 0.10]	0.039 [1.0]

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

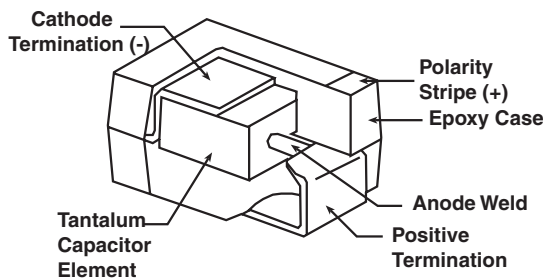
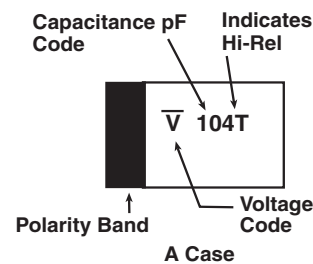


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Tantamount® Hi-Rel COTS, Molded Case

Vishay Sprague

RATINGS AND CASE CODES

μF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V
0.10							A	A
0.15							A	A/B
0.22							A	B
0.33						A	A	B
0.47					A	A	B	B/C
0.68				A	A	B	B	C
1.0			A	A	A	B	B	C
1.5		A	A	A	B	B	B/C	C/D
2.2	A	A		B	B	C	C	D
3.3	A	A	B	B	B	B/C	C	D
4.7	A	A/B	A/B	B	B/C	C	C/D	D
6.8	B	B	B	C	C	C/D	D	
10	B	B	C	C	C	C/D	D	
15	B	C	C		D	D		
22		C		D	D	D	E	
33	C		D	D	D	E		
47		D	D	D	E			
68	D	D	D	D	E			
100	D	D	D	E				
150	D	D/E						
220		E	E					
330	E	E						

CONSTRUCTION AND MARKING**CONSTRUCTION****MARKING**

Volts	Code
4.0	G
6.3	J
10	A
16	C
20	D
25	E
35	V
50	T

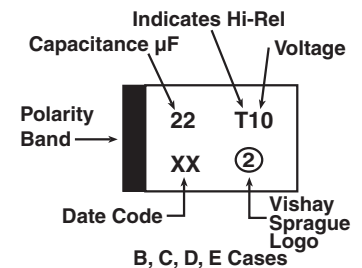
Marking:

Capacitor marking includes anode (+) polarity band, capacitance in microfarads and the voltage rating of + 85 °C. 'A' Case capacitors use a letter code for the voltage and EIA capacitance code.

The Sprague® trademark will be included if space permits. Capacitors rated at 6.3 V shall be marked 6 V.

A manufacturing date code is marked on all capacitors.

Call the factory for further explanation.



STANDARD/EXTENDED RATINGS

CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	STD. (S) MAX. ESR AT + 25 °C 100 kHz (Ohms)	LOW (L) MAX. ESR AT + 25 °C 100 kHz (Ohms)
4 WVDC AT + 85 °C, SURGE = 5.2 V . . . 2.7 WVDC AT + 125 °C, SURGE = 3.4 V						
2.2	A	T83A225(1)004(2)(3)(4)(5)	0.5	6	7.600	6.000
3.3	A	T83A335(1)004(2)(3)(4)(5)	0.5	6	7.600	4.000
4.7	A	T83A475(1)004(2)(3)(4)(5)	0.5	6	6.300	3.500
6.8	B	T83B685(1)004(2)(3)(4)(5)	0.5	6	4.500	2.000
10	B	T83B106(1)004(2)(3)(4)(5)	0.5	6	3.500	1.200
15	B	T83B156(1)004(2)(3)(4)(5)	0.6	6	2.900	1.200
33	C	T83C336(1)004(2)(3)(4)(5)	1.3	6	1.800	0.500
68	D	T83D686(1)004(2)(3)(4)(5)	2.7	6	0.800	0.175
100	D	T83D107(1)004(2)(3)(4)(5)	4.0	6	0.700	0.175
150	D	T83D157(1)004(2)(3)(4)(5)	6.0	8	0.600	0.150
330	E	T83E337(1)004(2)(3)(4)(5)	13.2	8	0.500	0.100
6.3 WVDC AT + 85 °C, SURGE = 8 V . . . 4 WVDC AT 125 °C, SURGE = 5 V						
1.5	A	T83A155(1)6R3(2)(3)(4)(5)	0.5	6	8.000	6.000
2.2	A	T83A225(1)6R3(2)(3)(4)(5)	0.5	6	7.600	6.000
3.3	A	T83A335(1)6R3(2)(3)(4)(5)	0.5	6	6.300	5.000
4.7	A	T83A475(1)6R3(2)(3)(4)(5)	0.5	6	5.500	3.500
4.7	B	T83B475(1)6R3(2)(3)(4)(5)	0.5	6	3.400	1.800
6.8	B	T83B685(1)6R3(2)(3)(4)(5)	0.5	6	3.400	1.200
10	B	T83B106(1)6R3(2)(3)(4)(5)	0.6	6	2.900	1.000
15	C	T83C156(1)6R3(2)(3)(4)(5)	0.9	6	1.800	0.600
22	C	T83C226(1)6R3(2)(3)(4)(5)	1.3	6	1.800	0.500
47	D	T83D476(1)6R3(2)(3)(4)(5)	2.8	6	0.800	0.200
68	D	T83D686(1)6R3(2)(3)(4)(5)	4.1	6	0.700	0.200
100	D	T83D107(1)6R3(2)(3)(4)(5)	6.0	6	0.700	0.140
150	D	T83D157(1)6R3(2)(3)(4)(5)	9.0	8	0.600	0.125
150	E	T83E157(1)6R3(2)(3)(4)(5)	9.0	8	0.500	0.100
220	E	T83E227(1)6R3(2)(3)(4)(5)	13.2	8	0.500	0.100
330	E	T83E337(1)6R3(2)(3)(4)(5)	19.8	8	0.500	0.100
10 WVDC AT + 85 °C, SURGE = 8 V . . . 4 WVDC AT 125 °C, SURGE = 5 V						
1	A	T83A105(1)010(2)(3)(4)(5)	0.5	4	9.300	6.000
1.5	A	T83A155(1)010(2)(3)(4)(5)	0.5	6	8.000	6.000
3.3	B	T83B335(1)010(2)(3)(4)(5)	0.5	6	3.500	2.500
4.7	A	T83A475(1)010(2)(3)(4)(5)	0.5	6	5.000	3.000
4.7	B	T83B475(1)010(2)(3)(4)(5)	0.5	6	3.400	1.500
6.8	B	T83B685(1)010(2)(3)(4)(5)	0.7	6	2.900	1.200
10	C	T83C106(1)010(2)(3)(4)(5)	1.0	6	1.800	0.550
15	C	T83C156(1)010(2)(3)(4)(5)	1.5	6	1.800	0.500
33	D	T83D336(1)010(2)(3)(4)(5)	3.3	6	0.800	0.250
47	D	T83D476(1)010(2)(3)(4)(5)	4.7	6	0.700	0.200
68	D	T83D686(1)010(2)(3)(4)(5)	6.8	6	0.700	0.150
100	D	T83D107(1)010(2)(3)(4)(5)	10.0	8	0.600	0.100
220	E	T83E227(1)010(2)(3)(4)(5)	22.0	8	0.500	0.100

(1) Capacitance Tolerance: K, M

(2) Termination and Packaging: C, D, E, F

(3) Reliability Level: A, B, C, S, Z

(4) Surge Current: A, B, S, Z

(5) ESR: L, S

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STANDARD/EXTENDED RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	STD. (S) MAX. ESR AT + 25 °C 100 kHz (Ohms)	LOW (L) MAX. ESR AT + 25 °C 100 kHz (Ohms)
16 WVDC AT + 85 °C, SURGE = 20 V . . . 10 WVDC AT + 125 °C, SURGE = 12 V						
0.68	A	T83A684(1)016(2)(3)(4)(5)	0.5	4	11.000	8.000
1	A	T83A105(1)016(2)(3)(4)(5)	0.5	4	9.300	6.000
1.5	A	T83A55(1)016A(2)(3)(4)(5)	0.5	6	6.700	6.000
2.2	B	T83B225(1)016(2)(3)(4)(5)	0.5	6	4.600	2.500
3.3	B	T83B335(1)016(2)(3)(4)(5)	0.5	6	3.500	2.000
4.7	B	T83B475(1)016(2)(3)(4)(5)	0.8	6	2.900	1.500
6.8	C	T83C685(1)016(2)(3)(4)(5)	1.1	6	1.900	0.600
10	C	T83C106(1)016(2)(3)(4)(5)	1.6	6	1.800	0.450
22	D	T83D226(1)016(2)(3)(4)(5)	3.5	6	0.800	0.250
33	D	T83D336(1)016(2)(3)(4)(5)	5.3	6	0.700	0.225
47	D	T83D476(1)016(2)(3)(4)(5)	7.5	6	0.700	0.150
68	D	T83D686(1)016(2)(3)(4)(5)	10.9	6	0.600	0.150
100	E	T83E107(1)016(2)(3)(4)(5)	16.0	8	0.600	0.100
20 WVDC AT + 85 °C, SURGE = 26 V . . . 13 WVDC AT + 125 °C, SURGE = 16 V						
0.47	A	T83A474(1)020(2)(3)(4)(5)	0.5	4	12.000	9.000
0.68	A	T83A684(1)020(2)(3)(4)(5)	0.5	4	10.000	8.000
1	A	T83A105(1)020(2)(3)(4)(5)	0.5	4	8.400	5.500
1.5	B	T83B155(1)020(2)(3)(4)(5)	0.5	6	4.600	2.500
2.2	B	T83B225(1)020(2)(3)(4)(5)	0.5	6	3.500	1.500
3.3	B	T83B335(1)020(2)(3)(4)(5)	0.7	6	3.000	1.300
4.7	B	T83B475(1)020(2)(3)(4)(5)	0.9	6	2.900	1.000
4.7	C	T83C475(1)020(2)(3)(4)(5)	0.9	6	2.300	0.600
6.8	C	T83C685(1)020(2)(3)(4)(5)	1.4	6	1.900	0.550
10	C	T83C106(1)020(2)(3)(4)(5)	2.0	6	1.700	0.450
15	D	T83D156(1)020(2)(3)(4)(5)	3.0	6	0.900	0.300
22	D	T83D226(1)020(2)(3)(4)(5)	4.4	6	0.700	0.225
33	D	T83D336(1)020(2)(3)(4)(5)	6.6	6	0.700	0.200
47	E	T83E476(1)020(2)(3)(4)(5)	9.4	6	0.600	0.150
68	E	T83E686(1)020(2)(3)(4)(5)	13.6	6	0.600	0.150
25 WVDC AT + 85 °C, SURGE = 32 V . . . 17 WVDC AT + 125 °C, SURGE = 20 V						
0.33	A	T83A334(1)025(2)(3)(4)(5)	0.5	4	14.000	10.000
0.47	A	T83A474(1)025(2)(3)(4)(5)	0.5	4	12.000	9.000
0.68	B	T83B684(1)025(2)(3)(4)(5)	0.5	4	7.000	5.000
1	B	T83B105(1)025(2)(3)(4)(5)	0.5	4	5.000	2.000
1.5	B	T83B155(1)025(2)(3)(4)(5)	0.5	6	4.600	2.000
2.2	C	T83C225(1)025(2)(3)(4)(5)	0.6	6	2.900	1.000
3.3	B	T83B335(1)025(2)(3)(4)(5)	0.8	6	3.100	1.500
3.3	C	T83C335(1)025(2)(3)(4)(5)	0.8	6	2.300	1.000
4.7	C	T83C475(1)025(2)(3)(4)(5)	1.2	6	2.000	0.525
6.8	C	T83C685(1)025(2)(3)(4)(5)	1.7	6	1.700	0.500
6.8	D	T83D685(1)025(2)(3)(4)(5)	1.7	6	1.200	0.350
10	C	T83C106(1)025(2)(3)(4)(5)	2.5	6	1.500	0.450

(1) Capacitance Tolerance: K, M

(2) Termination and Packaging: C, D, E, F

(3) Reliability Level: A, B, C, S, Z

(4) Surge Current: A, B, S, Z

(5) ESR: L, S

STANDARD/EXTENDED RATINGS

CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DC LEAKAGE AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	STD. (S) MAX. ESR AT + 25 °C 100 kHz (Ohms)	LOW (L) MAX. ESR AT + 25 °C 100 kHz (Ohms)
25 WVDC AT + 85 °C, SURGE = 32 V . . . 17 WVDC AT + 125 °C, SURGE = 20 V						
10	D	T83D106(1)025(2)(3)(4)(5)	2.5	6	1.000	0.300
15	D	T83D156(1)025(2)(3)(4)(5)	3.8	6	0.800	0.250
22	D	T83D226(1)025(2)(3)(4)(5)	5.5	6	0.700	0.200
33	E	T83E336(1)025(2)(3)(4)(5)	8.3	6	0.600	0.200
35 WVDC AT + 85 °C, SURGE = 46 V . . . 23 WVDC AT + 125 °C, SURGE = 28 V						
0.10	A	T83A104(1)035(2)(3)(4)(5)	0.5	4	20.000	10.000
0.15	A	T83A154(1)035(2)(3)(4)(5)	0.5	4	18.000	6.000
0.22	A	T83A224(1)035(2)(3)(4)(5)	0.5	4	15.000	6.000
0.33	A	T83A334(1)035(2)(3)(4)(5)	0.5	4	13.000	6.000
0.47	B	T83B474(1)035(2)(3)(4)(5)	0.5	4	8.000	2.500
0.68	B	T83B684(1)035(2)(3)(4)(5)	0.5	4	6.500	2.500
1	B	T83B105(1)035(2)(3)(4)(5)	0.5	4	5.000	2.000
1.5	B	T83B155(1)035(2)(3)(4)(5)	0.5	6	4.200	2.000
1.5	C	T83C155(1)035(2)(3)(4)(5)	0.5	6	3.800	0.900
2.2	C	T83C225(1)035(2)(3)(4)(5)	0.8	6	2.900	0.900
3.3	C	T83C335(1)035(2)(3)(4)(5)	1.2	6	2.100	0.700
4.7	C	T83C475(1)035(2)(3)(4)(5)	1.6	6	1.900	0.500
4.7	D	T83D475(1)035(2)(3)(4)(5)	1.6	6	1.300	0.450
6.8	D	T83D685(1)035(2)(3)(4)(5)	2.4	6	1.100	0.300
10	D	T83D106(1)035(2)(3)(4)(5)	3.5	6	0.800	0.300
22	E	T83E226(1)035(2)(3)(4)(5)	7.7	6	0.600	0.275
50 WVDC AT + 85 °C, SURGE = 65 V . . . 33 WVDC AT + 125 °C, SURGE = 40 V						
0.10	A	T83A104(1)050(2)(3)(4)(5)	0.5	4	19.000	10.000
0.15	A	T83A154(1)050(2)(3)(4)(5)	0.5	4	17.000	10.000
0.15	B	T83B154(1)050(2)(3)(4)(5)	0.5	4	14.000	9.000
0.22	B	T83B224(1)050(2)(3)(4)(5)	0.5	4	12.000	8.500
0.33	B	T83B334(1)050(2)(3)(4)(5)	0.5	4	10.000	4.500
0.47	B	T83B474(1)050(2)(3)(4)(5)	0.5	4	8.400	4.000
0.47	C	T83C474(1)050(2)(3)(4)(5)	0.5	4	6.700	1.800
0.68	C	T83C684(1)050(2)(3)(4)(5)	0.5	4	5.900	1.600
1	C	T83C105(1)050(2)(3)(4)(5)	0.5	4	4.600	1.600
1.5	C	T83C155(1)050(2)(3)(4)(5)	0.8	6	3.400	1.500
1.5	D	T83D155(1)050(2)(3)(4)(5)	0.8	6	2.900	1.000
2.2	D	T83D225(1)050(2)(3)(4)(5)	1.1	6	2.100	0.800
3.3	D	T83D335(1)050(2)(3)(4)(5)	1.7	6	1.700	0.800
4.7	D	T83D475(1)050(2)(3)(4)(5)	2.4	6	1.200	0.600

(1) Capacitance Tolerance: K, M

(2) Termination and Packaging: C, D, E, F

(3) Reliability Level: A, B, C, S, Z

(4) Surge Current: A, B, S, Z

(5) ESR: L, S



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Vishay Sprague

GUIDE TO APPLICATION

1. Recommended Voltage Derating Guidelines:

Standard Conditions, for example; output filters

CAPACITOR VOLTAGE RATING (V)	OPERATING VOLTAGE (V)
4.0	2.5
6.3	3.6
10	6.0
16	10
20	12
25	15
35	24
50	28

Severe Conditions, for example; input filters

CAPACITOR VOLTAGE RATING (V)	OPERATING VOLTAGE (V)
4.0	2.5
6.3	3.3
10	5.0
16	8.0
20	10
25	12
35	15
50	24

2. **A-C Ripple Current:** The maximum allowable ripple current shall be determined from the formula:

$$I_{rms} = \sqrt{\frac{P}{R_{ESR}}}$$

where,

P = Power Dissipation in Watts at + 25 °C as given in the table in Paragraph Number 6 (Power Dissipation)

R_{ESR} = The capacitor Equivalent Series Resistance at the specified frequency.

3. **A-C Ripple Voltage:** The maximum allowable ripple voltage shall be determined from the formula:

$$V_{rms} = Z \sqrt{\frac{P}{R_{ESR}}}$$

or, from the formula:

$$V_{rms} = I_{rms} \times Z$$

where,

P = Power Dissipation in Watts at + 25 °C as given in the table in Paragraph Number 6 (Power Dissipation).

R_{ESR} = The capacitor Equivalent Series Resistance at the specified frequency.

Z = The capacitor impedance at the specified frequency.

- 3.1 The sum of the peak AC voltage plus the applied DC voltage shall not exceed the DC voltage rating of the capacitor.

- 3.2 The sum of the negative peak AC voltage plus the applied DC voltage shall not allow a voltage reversal exceeding 10 % of the DC working voltage at + 25 °C.

4. **Reverse Voltage:** These capacitors are capable of withstanding peak voltages in the reverse direction equal to 10 % of the DC rating at + 25 °C, 5 % of the DC rating at + 85 °C and 1 % of the DC rating at + 125 °C.

5. **Temperature Derating:** If these capacitors are to be operated at temperatures above + 25 °C, the permissible rms ripple current or voltage shall be calculated using the derating factors as shown:

TEMPERATURE	DERATING FACTOR
+ 25 °C	1.0
+ 85 °C	0.9
+ 125 °C	0.4

6. **Power Dissipation:** Power dissipation will be affected by the heat sinking capability of the mounting surface. Non-sinusoidal ripple current may produce heating effects which differ from those shown. It is important that the equivalent I_{rms} value be established when calculating permissible operating levels. (Power Dissipation calculated using + 25 °C temperature rise.)

CASE CODE	MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (WATTS) IN FREE AIR
A	0.075
B	0.085
C	0.110
D	0.150
E	0.165

7. **Printed Circuit Board Materials:** Type T83 capacitors are compatible with commonly used printed circuit board materials (alumina substrates, FR4, FR5, G10, PTFE-fluorocarbon and porcelainized steel).

8. **Attachment:**

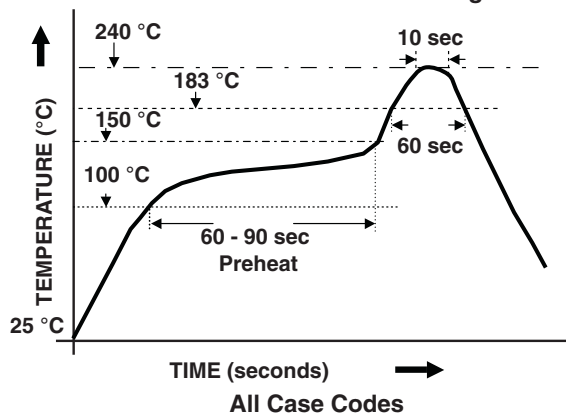
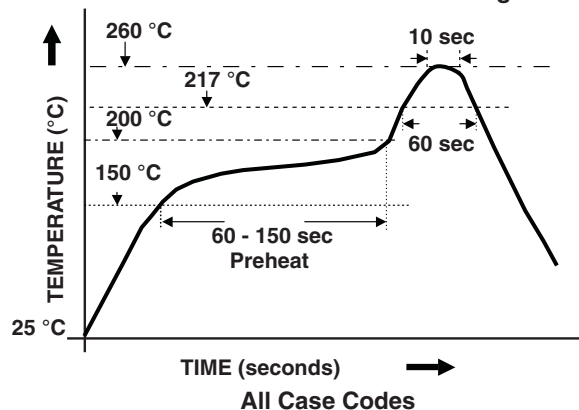
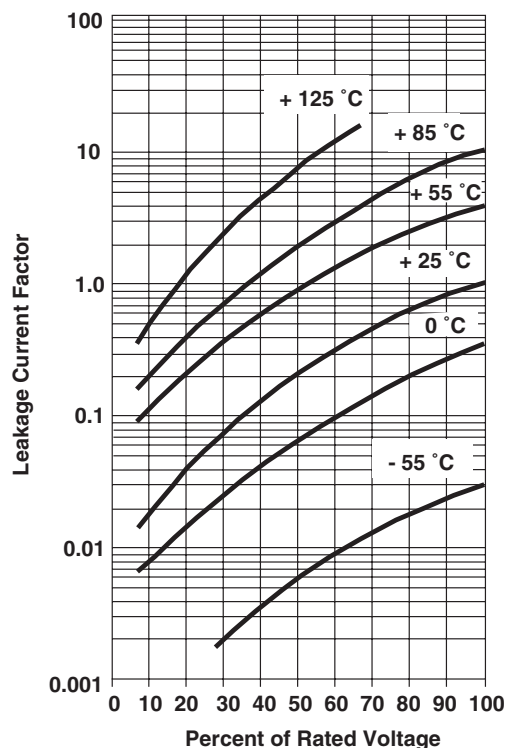
- 8.1 **Solder Paste:** The recommended thickness of the solder paste after application is 0.007" ± 0.001" [0.178 mm ± 0.025 mm]. Care should be exercised in selecting the solder paste. The metal purity should be as high as practical. The flux (in the paste) must be active enough to remove the oxides formed on the metallization prior to the exposure to soldering heat. In practice this can be aided by extending the solder preheat time at temperatures below the liquidous state of the solder.

GUIDE TO APPLICATION (Continued)

- 8.2. **Soldering:** Capacitors can be attached by conventional soldering techniques; vapor phase, convection reflow, infrared reflow, wave soldering and hot plate methods. The Soldering Profile charts show recommended time/temperature conditions for soldering. Preheating is recommended. The recommended maximum ramp rate is 2 °C per second. Attachment with a soldering iron is not recommended due to the difficulty of controlling temperature and time at temperature. The soldering iron must never come in contact with the capacitor.
- 8.2.1. **Backward and Forward Compatibility:** Capacitors with SnPb or 100 % tin termination finishes can be soldered using SnPb or lead (Pb)-free soldering processes.

9. **Cleaning (Flux Removal) After Soldering:** The T83 is compatible with all commonly used solvents such as TES, TMS, Prelete, Chloroethane, Terpene and aqueous cleaning media. However, CFC/ODS products are not used in the production of these devices and are not recommended. Solvents containing methylene chloride or other epoxy solvents should be avoided since these will attack the epoxy encapsulation material.
- 9.1 When using ultrasonic cleaning, the board may resonate if the output power is too high. This vibration can cause cracking or a decrease in the adherence of the termination. DO NOT EXCEED 9W/I AT 40 kHz for 2 minutes.
10. **Leakage Current:** Capacitors shall be stabilized at the rated temperature for 30 minutes. Rated voltage shall be applied to capacitors for 5 minutes using a steady source of power (such as a regulated power supply) with 1000 ohm resistor connected in series with the capacitor under test to limit the charging current. Leakage current shall then be measured.

Note that the leakage current varies with temperature and applied voltage. See graph opposite for the appropriate adjustment factor.

SOLDERING PROFILE**Recommended SnPb Reflow Soldering Profile****Recommended Pb Free Reflow Soldering Profile****TYPICAL LEAKAGE CURRENT FACTOR RANGE**

Solid Tantalum Chip Capacitors Tantamount® Hi-Rel COTS, Molded Case

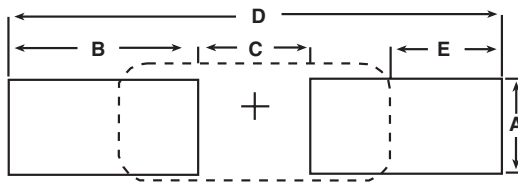
Vishay Sprague

- 10.1 **At + 25 °C**, the leakage current shall not exceed the value listed in the Standard Ratings Table.
- 10.2 **At + 85 °C**, the leakage current shall not exceed 10 times the value listed in the Standard Ratings Table.
- 10.3 **At + 125 °C**, the leakage current shall not exceed 12 times the value listed in the Standard Ratings Table.

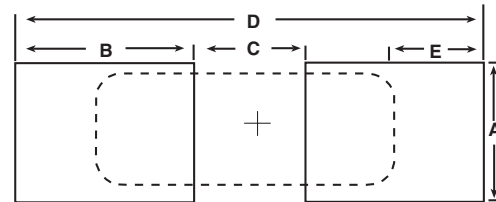
11. **Recommended Mounting Pad Geometries:** Proper mounting pad geometries are essential for successful solder connections. These dimensions are highly process sensitive and should be designed to minimize component rework due to unacceptable solder joints. The dimensional configurations shown are the recommended pad geometries for both wave and reflow soldering techniques. These dimensions are intended to be a starting point for circuit board designers and may be fine tuned if necessary based upon the peculiarities of the soldering process and/or circuit board design.

RECOMMENDED MOUNTING PAD GEOMETRIES in inches [millimeters]

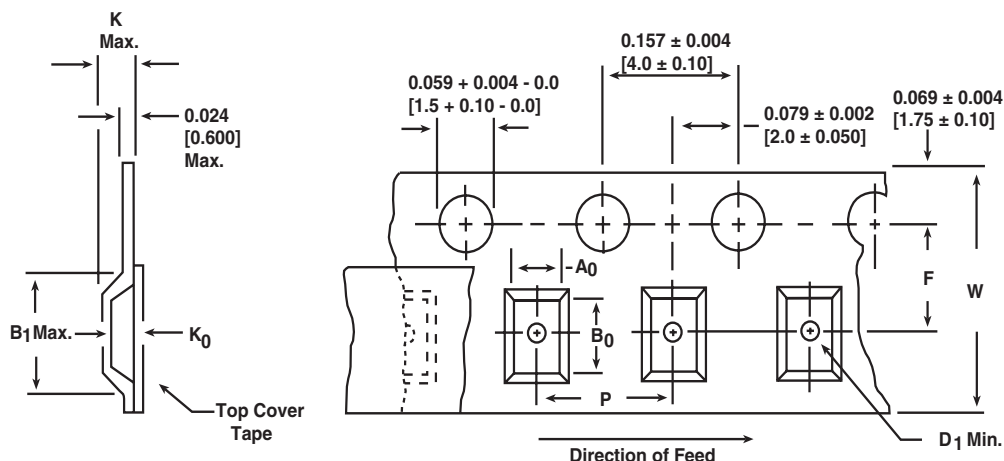
Wave Solder Pads



Reflow Solder Pads

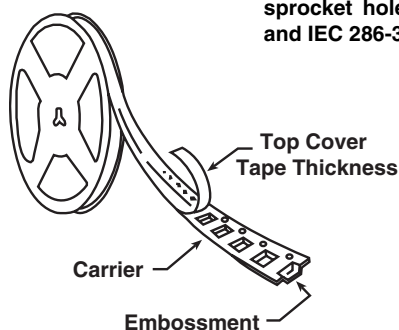


PAD DIMENSIONS						PAD DIMENSIONS					
CASE CODE	A (MIN.)	B (NOM.)	C (NOM.)	D (NOM.)	E (NOM.)	CASE CODE	A (MIN.)	B (NOM.)	C (NOM.)	D (NOM.)	E (NOM.)
A	0.034 [0.87]	0.085 [2.15]	0.053 [1.35]	0.222 [5.65]	0.048 [1.23]	A	0.071 [1.80]	0.085 [2.15]	0.053 [1.35]	0.222 [5.65]	0.048 [1.23]
B	0.061 [1.54]	0.085 [2.15]	0.065 [1.65]	0.234 [5.95]	0.048 [1.23]	B	0.110 [2.80]	0.085 [2.15]	0.065 [1.65]	0.234 [5.95]	0.048 [1.23]
C	0.061 [1.54]	0.106 [2.70]	0.124 [3.15]	0.337 [8.55]	0.050 [1.28]	C	0.110 [2.80]	0.106 [2.70]	0.124 [3.15]	0.337 [8.55]	0.050 [1.28]
D	0.066 [1.68]	0.106 [2.70]	0.175 [4.45]	0.388 [9.85]	0.050 [1.28]	D	0.118 [3.00]	0.106 [2.70]	0.175 [4.45]	0.388 [9.85]	0.050 [1.28]
E	0.066 [1.68]	0.106 [2.70]	0.175 [4.45]	0.388 [9.85]	0.050 [1.28]	E	0.118 [3.00]	0.106 [2.70]	0.175 [4.45]	0.388 [9.85]	0.050 [1.28]

TAPE AND REEL PACKAGING in inches [millimeters]

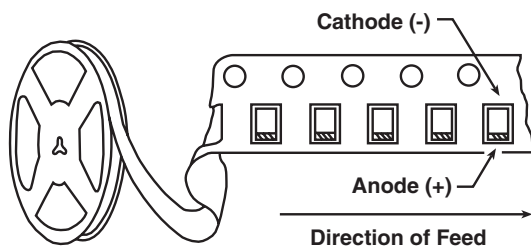
TAPE SIZE	B ₁ (MAX.)	D ₁ (MIN.)	F	K (MAX.)	P	W	A ₀ B ₀ K ₀
8 mm	0.165 [4.2]	0.039 [1.0]	0.138 ± 0.002 [3.5 ± 0.05]	0.094 [2.4]	0.157 ± 0.004 [4.0 ± 1.0]	0.315 ± 0.012 [8.0 ± 0.30]	Notes: A ₀ B ₀ K ₀ are determined by component size. The clearance between the component and the cavity must be within 0.002" [0.05 mm] minimum to 0.020" [0.50 mm] maximum for 8 mm tape and 0.002" [0.05 mm] minimum to 0.026" [0.65 mm] maximum for 12 mm tape.
12 mm	0.323 [8.2]	0.059 [1.5]	0.217 ± 0.002 [5.5 ± 0.05]	0.177 [4.5]	0.315 ± 0.004 [8.0 ± 1.0]	0.472 ± 0.012 [12.0 ± 0.30]	

Standard orientation is with the cathode (-) nearest to the sprocket holes per EIA-481-1 and IEC 286-3.



Tape and Reel Specifications: All case codes are available on plastic embossed tape per EIA-481-1. Tape reeling per IEC 286-3 is also available. Standard reel diameter is 13" [330 mm]. 7" [178 mm] reels are available.

The most efficient packaging quantities are full reel increments on a given reel diameter. The quantities shown allow for the sealed empty pockets required to be in conformance with EIA-481-1. Reel size must be specified in the Vishay Sprague part number.



CASE CODE	TAPE WIDTH	COMPONENT PITCH	UNITS PER REEL	
			7" [178 mm] REEL	13" [330 mm] REEL
A	8 mm	4 mm	2000	9000
B	8 mm	4 mm	2000	8000
C	12 mm	8 mm	500	3000
D	12 mm	8 mm	500	2500
E	12 mm	8 mm	400	1500



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