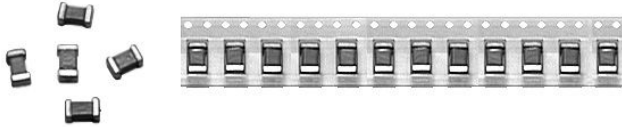


Solid Tantalum Chip Capacitors, MIDGET[®], Conformal Coated



FEATURES

- 8 mm, 12 mm, 16 mm tape and reel packaging available per EIA-481-1 and reeling per IEC 286-3, 7" [178 mm] standard
- Compliant to RoHS Directive 2002/95/EC



RoHS*
COMPLIANT

PERFORMANCE CHARACTERISTICS

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

Note: Refer to Doc. 40088

Capacitance Range: 0.10 µF to 330 µF

Capacitance Tolerance: ± 10 %, ± 20 % standard

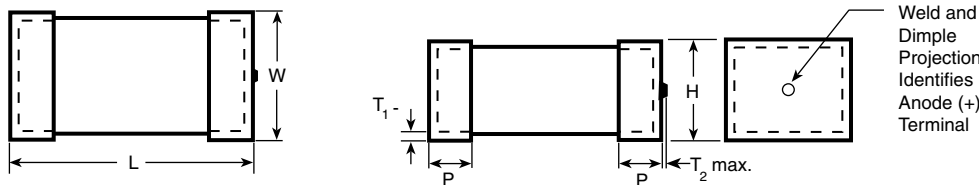
Voltage Rating: 4 WV_{DC} to 50 WV_{DC}

ORDERING INFORMATION						
194D	225	X0	004	A	2	T
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	CASE CODE	TERMINATION	PACKAGING
This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow	X0 = ± 20 % X9 = ± 10 % X5 = ± 5 % Special Order		This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating	See Ratings and Case Codes Table	2 = Gold plated Standard (RoHS compliant) (50 µ" minimum) 8 = 60/40 solder plated 7 = Hot solder dipped	T = T/R (full reel) 7" [178 mm] reel standard H = T/R (half reel) 7" [178 mm] B = Bulk See Tape and Reel Specifications

Note

- Preferred tolerance and reel sizes are in bold.
- We reserve the right to supply higher voltage ratings and tighter capacitance tolerance capacitors in the same case size. Voltage substitutions will be marked with the higher voltage rating.

DIMENSIONS in inches [millimeters]



CASE CODE	W	L	H	P	T ₁	T ₂ (MAX.)
A	0.050 ± 0.015 [1.27 ± 0.38]	0.100 ± 0.015 [2.54 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
B	0.050 ± 0.015 [1.27 ± 0.38]	0.150 ± 0.015 [3.81 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
C	0.050 ± 0.015 [1.27 ± 0.38]	0.200 ± 0.015 [5.08 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
D	0.100 ± 0.015 [2.54 ± 0.38]	0.150 ± 0.015 [3.81 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
E	0.100 ± 0.015 [2.54 ± 0.38]	0.200 ± 0.015 [5.08 ± 0.38]	0.050 ± 0.015 [1.27 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
F	0.135 ± 0.015 [3.43 ± 0.38]	0.220 ± 0.015 [5.59 ± 0.38]	0.070 ± 0.015 [1.78 ± 0.38]	0.030 ± 0.005 [0.76 ± 0.13]	0.005 [0.13]	0.015 [0.38]
G	0.110 ± 0.015 [2.79 ± 0.38]	0.265 ± 0.015 [6.73 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.050 ± 0.005 [1.27 ± 0.13]	0.005 [0.13]	0.015 [0.38]
H	0.150 ± 0.015 [3.81 ± 0.38]	0.285 ± 0.015 [7.24 ± 0.38]	0.110 ± 0.015 [2.79 ± 0.38]	0.050 ± 0.005 [1.27 ± 0.13]	0.005 [0.13]	0.015 [0.38]

Note

- When solder coated terminations are required, add 0.015" [0.381 mm] to termination dimension tolerances
- * Pb containing terminations that are not RoHS compliant, exemptions may apply.



194D RATINGS AND CASE CODES								
μF	4 V	6 V	10 V	15 V	20 V	25 V	35 V	50 V
0.10							A	A
0.15							A	A
0.22							A	B
0.33						A	B	B
0.47					A	A/B	B	C
0.68				A	A/B	B	C	D
1.0			A	A/B	A/B	C	D	E
1.5		A	A/B	A/B	B/C	D	E	F
2.2	A	A/B	A/B	A/B/C	C/D	E	F	F
3.3	A/B	A/B	A/B/C	C/D	D/E	F	F	G
4.7	B	A/B/C	B/C/D	D/E	E/F	F	F/G	H
6.8	B/C	C/D	D/E	E/F	F	F/G	G/H	H
10	C/D	D/E	E/F	E/F	E/F/G	F/G	G/H	
15	D/E	E/F	E/F	F/G	F/G	H	H	
22	E/F	F	F/G	F/G	G/H	H		
33	F	F/G	F/G	G/H	H	H		
47	F/G	F/G	G/H	G/H				
68	F/G	G/H	H	H				
100	H	H	H					
120	H	H	H					
150	H	H						
330	H	H						

STANDARD/EXTENDED RATINGS				
CAPACITANCE (μF)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)
4 WV _{DC} AT + 85 °C, SURGE = 5 V . . . 2.7 WV _{DC} AT + 125 °C, SURGE = 3.4 V				
2.2	A	194D225X_004A2	0.5	6
3.3	A	194D335X_004A2	0.5	6
3.3	B	194D335X_004B2	0.5	6
4.7	B	194D475X_004B2	0.5	6
6.8	B	194D685X_004B2	0.5	6
6.8	C	194D685X_004C2	0.5	6
10	C	194D106X_004C2	0.5	6
10	D	194D106X_004D2	0.5	6
15	D	194D156X_004D2	0.6	6
15	E	194D156X_004E2	0.6	6
22	E	194D226X_004E2	0.9	6
22	F	194D226X_004F2	0.9	6
33	F	194D336X_004F2	1.3	6
47	F	194D476X_004F2	1.9	6
47	G	194D476X_004G2	1.9	6
68	F	194D686X_004F2	2.7	6
68	G	194D686X_004G2	2.7	6
100	H	194D107X_004H2	4.0	8
120	H	194D127X_004H2	4.8	8
150	H	194D157X_004H2	6.0	8
330	H	194D337X_004H2	13.2	10

Note

(1) For 10 % tolerance, specify "9"; for 20 % tolerance, change to "0".

STANDARD/EXTENDED RATINGS

CAPACITANCE (μ F)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)
6 WV_{DC} AT + 85 °C, SURGE = 8 V . . . 4 WV_{DC} AT + 125 °C, SURGE = 5 V				
1.5	A	194D155X_006A2	0.5	6
2.2	A	194D225X_006A2	0.5	6
2.2	B	194D225X_006B2	0.5	6
3.3	A	194D335X_006A2	0.5	6
3.3	B	194D335X_006B2	0.5	6
4.7	A	194D475X_006A2	0.5	6
4.7	B	194D475X_006B2	0.5	6
4.7	C	194D475X_006C2	0.5	6
6.8	C	194D685X_006C2	0.5	6
6.8	D	194D685X_006D2	0.5	6
10	D	194D106X_006D2	0.6	6
10	E	194D106X_006E2	0.6	6
15	E	194D156X_006E2	1.0	6
15	F	194D156X_006F2	1.0	6
22	F	194D226X_006F2	1.4	6
33	F	194D336X_006F2	2.1	6
33	G	194D336X_006G2	2.1	6
47	F	194D476X_006F2	3.0	6
47	G	194D476X_006G2	3.0	6
68	G	194D686X_006G2	4.3	6
68	H	194D686X_006H2	4.3	6
100	H	194D107X_006H2	6.0	8
120	H	194D127X_006H2	7.2	8
150	H	194D157X_006H2	9.0	8
330	H	194D337X_006H2	20	10
10 WV_{DC} AT + 85 °C, SURGE = 13 V . . . 7 WV_{DC} AT + 125 °C, SURGE = 9 V				
1.0	A	194D105X_010A2	0.5	4
1.5	A	194D155X_010A2	0.5	6
1.5	B	194D155X_010B2	0.5	6
2.2	A	194D225X_010A2	0.5	6
2.2	B	194D225X_010B2	0.5	6
3.3	A	194D335X_010A2	0.5	6
3.3	B	194D335X_010B2	0.5	6
3.3	C	194D335X_010C2	0.5	6
4.7	B	194D475X_010B2	0.5	6
4.7	C	194D475X_010C2	0.5	6
4.7	D	194D475X_010D2	0.5	6
6.8	D	194D685X_010D2	0.7	6
6.8	E	194D685X_010E2	0.7	6
10	C	194D106X_010C2	1.0	6
10	E	194D106X_010E2	1.0	6
10	F	194D106X_010F2	1.0	6
15	E	194D156X_010E2	1.5	6
15	F	194D156X_010F2	1.5	6
22	F	194D226X_010F2	2.2	6
22	G	194D226X_010G2	2.2	6
33	F	194D336X_010F2	3.3	6
33	G	194D336X_010G2	3.3	6
47	G	194D476X_010G2	4.7	6
47	H	194D476X_010H2	4.7	6
68	H	194D686X_010H2	6.8	6
100	H	194D107X_010H2	10	8
120	H	194D127X_010H2	12	8

Note

(1) For 10 % tolerance, specify "9"; for 20 % tolerance, change to "0".



Solid Tantalum Chip Capacitors,
MIDGET[®], Conformal Coated

Vishay Sprague

STANDARD/EXTENDED RATINGS				
CAPACITANCE (μ F)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)
15 WV_{DC} AT + 85 °C, SURGE = 20 V . . . 10 WV_{DC} AT + 125 °C, SURGE = 12 V				
0.68	A	194D684X_015A2	0.5	4
1.0	A	194D105X_015A2	0.5	4
1.0	B	194D105X_015B2	0.5	4
1.5	A	194D155X_015A2	0.5	6
1.5	B	194D155X_015B2	0.5	6
2.2	A	194D225X_015A2	0.5	6
2.2	B	194D225X_015B2	0.5	6
2.2	C	194D225X_015C2	0.5	6
3.3	C	194D335X_015C2	0.5	6
3.3	D	194D335X_015D2	0.5	6
4.7	D	194D475X_015D2	0.7	6
4.7	E	194D475X_015E2	0.7	6
6.8	E	194D685X_015E2	1.1	6
6.8	F	194D685X_015F2	1.1	6
10	E	194D106X_015E2	1.6	6
10	F	194D106X_015F2	1.6	6
15	F	194D156X_015F2	2.4	6
15	G	194D156X_015G2	2.4	6
22	F	194D226X_015F2	3.5	6
22	G	194D226X_015G2	3.5	6
33	G	194D336X_015G2	5.3	6
33	H	194D336X_015H2	5.3	6
47	G	194D476X_015G2	10	8
47	H	194D476X_015H2	7.0	6
68	H	194D686X_015H2	10	6
20 WV_{DC} AT + 85 °C, SURGE = 26 V . . . 13 WV_{DC} AT + 125 °C, SURGE = 16 V				
0.47	A	194D474X_020A2	0.5	4
0.68	A	194D684X_020A2	0.5	4
0.68	B	194D684X_020B2	0.5	4
1.0	A	194D105X_020A2	0.5	4
1.0	B	194D105X_020B2	0.5	4
1.5	B	194D155X_020B2	0.5	6
1.5	C	194D155X_020C2	0.5	6
2.2	C	194D225X_020C2	0.5	6
2.2	D	194D225X_020D2	0.5	6
3.3	D	194D335X_020D2	0.7	6
3.3	E	194D335X_020E2	0.7	6
4.7	E	194D475X_020E2	0.9	6
4.7	F	194D475X_020F2	0.9	6
6.8	F	194D685X_020F2	1.4	6
10	E	194D106X_020E2	2.0	6
10	F	194D106X_020F2	2.0	6
10	G	194D106X_020G2	2.0	6
15	F	194D156X_020F2	3.0	6
15	G	194D156X_020G2	3.0	6
22	G	194D226X_020G2	4.0	8
22	H	194D226X_020H2	4.4	6
33	H	194D336X_020H2	6.6	6

Note

(1) For 10 % tolerance, specify "9"; for 20 % tolerance, change to "0".

STANDARD/EXTENDED RATINGS				
CAPACITANCE (μ F)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)
25 WV_{DC} AT + 85 °C, SURGE = 32 V . . . 17 WV_{DC} AT + 125 °C, SURGE = 20 V				
0.33	A	194D334X_025A2	0.5	4
0.47	A	194D474X_025A2	0.5	4
0.47	B	194D474X_025B2	0.5	4
0.68	B	194D684X_025B2	0.5	4
1.0	C	194D105X_025C2	0.5	4
1.5	D	194D155X_025D2	0.5	6
2.2	E	194D225X_025E2	0.6	6
3.3	F	194D335X_025F2	0.8	6
4.7	F	194D475X_025F2	1.2	6
6.8	F	194D685X_025F2	1.7	6
6.8	G	194D685X_025G2	1.7	6
10	F	194D106X_025F2	2.5	6
10	G	194D106X_025G2	2.5	6
15	H	194D156X_025H2	3.8	6
22	H	194D226X_025H2	5.5	6
33	H	194D336X_025H2	10	8
35 WV_{DC} AT + 85 °C, SURGE = 46 V . . . 23 WV_{DC} AT + 125 °C, SURGE = 28 V				
0.10	A	194D104X_035A2	0.5	4
0.15	A	194D154X_035A2	0.5	4
0.22	A	194D224X_035A2	0.5	4
0.33	B	194D334X_035B2	0.5	4
0.47	B	194D474X_035B2	0.5	4
0.68	C	194D684X_035C2	0.5	4
1.0	D	194D105X_035D2	0.5	4
1.5	E	194D155X_035E2	0.5	6
2.2	F	194D225X_035F2	0.8	6
3.3	F	194D335X_035F2	1.2	6
4.7	F	194D475X_035F2	1.6	6
4.7	G	194D475X_035G2	1.6	6
6.8	G	194D685X_035G2	2.4	6
6.8	H	194D685X_035H2	2.4	6
10	G	194D106X_035G2	3.5	6
10	H	194D106X_035H2	3.5	6
15	H	194D156X_035H2	5.3	6
50 WV_{DC} AT + 85 °C, SURGE = 65 V . . . 33 WV_{DC} AT + 125 °C, SURGE = 38 V				
0.10	A	194D104X_050A2	0.5	4
0.15	A	194D154X_050A2	0.5	4
0.22	B	194D224X_050B2	0.5	4
0.33 (2)	B	194D334X_050B2	0.5	4
0.47	C	194D474X_050C2	0.5	4
0.68	D	194D684X_050D2	0.5	4
1.0	E	194D105X_050E2	0.5	4
1.5	F	194D155X_050F2	0.8	6
2.2	F	194D225X_050F2	1.1	6
3.3	G	194D335X_050G2	1.7	6
4.7	H	194D475X_050H2	2.4	6
6.8	H	194D685X_050H2	3.4	6

Notes

(1) For 10 % tolerance, specify "9"; for 20 % tolerance, change to "0".

(2) 5 % tolerance is not available for the 0.33 μ F/50 V design



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