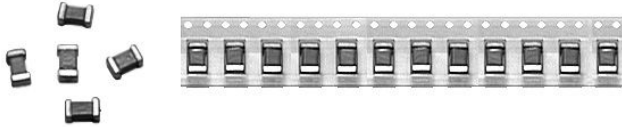


## Solid Tantalum Chip Capacitors, MIDGET<sup>®</sup>, Conformal Coated



### 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

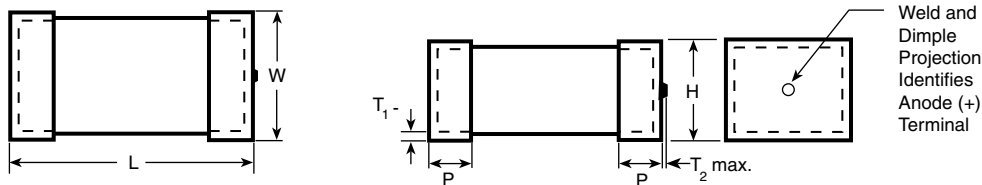
**Voltage Rating:** 4 WV<sub>DC</sub> to 50 WV<sub>DC</sub>

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	<b>X0 = ± 20 %</b> 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	<b>2 = Gold plated Standard (RoHS compliant) (50 µ" minimum)</b> 8 = 60/40 solder plated 7 = Hot solder dipped	<b>T = T/R (full reel) 7" [178 mm] reel standard</b> 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 <sub>1</sub>	T <sub>2</sub> (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 <sub>DC</sub> AT + 85 °C, SURGE = 5 V . . . 2.7 WV <sub>DC</sub> 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 ( $\mu$ F)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C ( $\mu$ A)	MAX. DF AT + 25 °C 120 Hz (%)
<b>6 WV<sub>DC</sub> AT + 85 °C, SURGE = 8 V . . . 4 WV<sub>DC</sub> AT + 125 °C, SURGE = 5 V</b>				
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
<b>10 WV<sub>DC</sub> AT + 85 °C, SURGE = 13 V . . . 7 WV<sub>DC</sub> AT + 125 °C, SURGE = 9 V</b>				
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".



<b>STANDARD/EXTENDED RATINGS</b>				
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C ( $\mu$ A)	MAX. DF AT + 25 °C 120 Hz (%)
<b>15 WV<sub>DC</sub> AT + 85 °C, SURGE = 20 V . . . 10 WV<sub>DC</sub> AT + 125 °C, SURGE = 12 V</b>				
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
<b>20 WV<sub>DC</sub> AT + 85 °C, SURGE = 26 V . . . 13 WV<sub>DC</sub> AT + 125 °C, SURGE = 16 V</b>				
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".

<b>STANDARD/EXTENDED RATINGS</b>				
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C ( $\mu$ A)	MAX. DF AT + 25 °C 120 Hz (%)
<b>25 WV<sub>DC</sub> AT + 85 °C, SURGE = 32 V . . . 17 WV<sub>DC</sub> AT + 125 °C, SURGE = 20 V</b>				
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
<b>35 WV<sub>DC</sub> AT + 85 °C, SURGE = 46 V . . . 23 WV<sub>DC</sub> AT + 125 °C, SURGE = 28 V</b>				
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
<b>50 WV<sub>DC</sub> AT + 85 °C, SURGE = 65 V . . . 33 WV<sub>DC</sub> AT + 125 °C, SURGE = 38 V</b>				
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  $\mu$ F/50 V design



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