

Solid Tantalum Chip Capacitors, TANTAMOUNT[®], Conformal Coated, Maximum CV



FEATURES

- Large capacitance rating range
- Terminations: 100 % Tin (2) standard
- 8 mm, 12 mm tape and reel packaging available per EIA 481-1 and reeling per IEC 286-3. 7" [178 mm] standard. 13" [330 mm] available.
- Case code compatibility with EIA 535BAAC and CECC30801 molded chips
- 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: 0.1 μ F to 1500 μ F

Capacitance Tolerance: \pm 10 %, \pm 20 % standard

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

ORDERING INFORMATION

595D TYPE	106 CAPACITANCE	X0 CAPACITANCE TOLERANCE	010 DC VOLTAGE RATING AT + 85 °C	A CASE CODE	2 TERMINATION	T PACKAGING
	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	X0 = \pm 20 % X9 = \pm 10 %	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 V).	See ratings and case codes table	2 = 100 % tin 4 = Gold plated 8 = Solder plated 60/40 Special order	T = Tape and reel 7" [178 mm] reel W = 13" [330 mm] reel see tape and reel specifications

Notes

- 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.

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

Solid Tantalum Chip Capacitors,
 TANTAMOUNT[®], Conformal Coated, Maximum CV

Vishay Sprague

DIMENSIONS in inches [millimeters]							
CASE CODE	L (MAX.)	W	H	A	B	D (REF.)	J (MAX.)
T	0.087 [2.2]	0.045 ± 0.012 [1.1 ± 0.3]	0.045 ± 0.012 [1.1 ± 0.3]	0.016 ± 0.008 [0.4 ± 0.2]	0.042 ± 0.010 [1.07 ± 0.25]	0.063 [1.6]	0.004 [0.1]
S	0.126 ± 0.008 [3.2 ± 0.2]	0.067 ± 0.008 [1.7 ± 0.2]	0.051 ± 0.008 [1.3 ± 0.2]	0.031 ± 0.012 [0.80 ± 0.30]	0.078 ± 0.012 [2.0 ± 0.3]	0.086 [2.2]	0.004 [0.1]
A	0.146 [3.7]	0.072 ± 0.012 [1.8 ± 0.3]	0.056 ± 0.012 [1.4 ± 0.3]	0.031 ± 0.012 [0.80 ± 0.30]	0.085 ± 0.016 [2.2 ± 0.4]	0.115 [2.9]	0.004 [0.1]
B	0.158 [4.0]	0.110 + 0.012 - 0.016 [2.8 + 0.3 - 0.4]	0.075 + 0.012 - 0.024 [1.9 + 0.3 - 0.6]	0.031 ± 0.012 [0.80 ± 0.30]	0.097 ± 0.016 [2.5 ± 0.4]	0.138 [3.5]	0.004 [0.1]
C	0.281 [7.1]	0.126 ± 0.012 [3.2 ± 0.3]	0.098 ± 0.012 [2.5 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.30]	0.180 ± 0.024 [4.6 ± 0.6]	0.236 [6.0]	0.004 [0.1]
G	0.205 ± 0.016 [5.2 ± 0.4]	0.144 ± 0.016 [3.65 ± 0.4]	0.087 [2.2] Max.	0.051 ± 0.012 [1.3 ± 0.3]	0.133 ± 0.016 [3.4 ± 0.4]	0.173 [4.4]	0.004 [0.1]
D	0.293 [7.5]	0.170 ± 0.012/- 0.024 [4.3 ± 0.3/- 0.6]	0.110 ± 0.012 [2.8 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.30]	0.180 ± 0.024 [4.6 ± 0.6]	0.253 [6.4]	0.004 [0.1]
M	0.129 ± 0.012 [3.3 ± 0.3]	0.106 ± 0.012 [2.7 ± 0.3]	0.067 ± 0.012 [1.7 ± 0.3]	0.031 ± 0.012 [0.80 ± 0.3]	0.078 ± 0.012 [2.0 ± 0.3]	0.095 [2.5]	0.004 [0.1]
R	0.283 [7.2]	0.235 ± 0.012/- 0.024 [6.0 ± 0.3/- 0.6]	0.136 ± 0.012/- 0.016 [3.5 ± 0.3/- 0.4]	0.051 ± 0.012 [1.3 ± 0.30]	0.180 ± 0.024 [4.6 ± 0.6]	0.243 [6.2]	0.004 [0.1]

Note

• The anode termination (D less B) will be a minimum of 0.012" (0.3 mm). T case = 0.005" (0.13 mm) minimum.

RATINGS AND CASE CODES								
µF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V
0.1								T
0.15								T
0.22								A/T
0.33							T	A
0.47						T	A	A
0.68					T	A	A	A/B
1.0					T	A	A	A/B
1.5				T		A	A/B	B/C
2.2			T	T/A	A	A/B	B	B/C
3.3		A/T	A	T	A	B	B/C	C
4.7	T	A	A/T	A	A/B	B/C	B/C	C
6.8	T	T	A	A	A/B	B	C	C/D
10	T		A	A/B	B	B/C	D	D/R
15	A	A	A/B	A/B	B	C	C/D	R
22		A/B	A/B	B/M	B/C	C/D	D/R	R
33	A/B	S/A/B	A/B	B/C		C/D	R	
47	A	A/B	B/C	B/C	C/D	D/R	R	
68	A	A/B	B/C	C/D	C/D	D/R		
100	A/B	B/C/M	B/C/D	C/D	D/R	R		
120	C	C	C/D	R	R			
150	B/C	D	C/D	D/R	R			
180	D	D	D/R	R	R			
220	C/D	C/D/G	C/D/R	R				
270	C/D		R					
330	C	C/D/R	D/R	R				
390	D	R	R					
470	C/R	D/R	R					
560		R						
680	D	R	R					
1000	R	R						
1500	R							

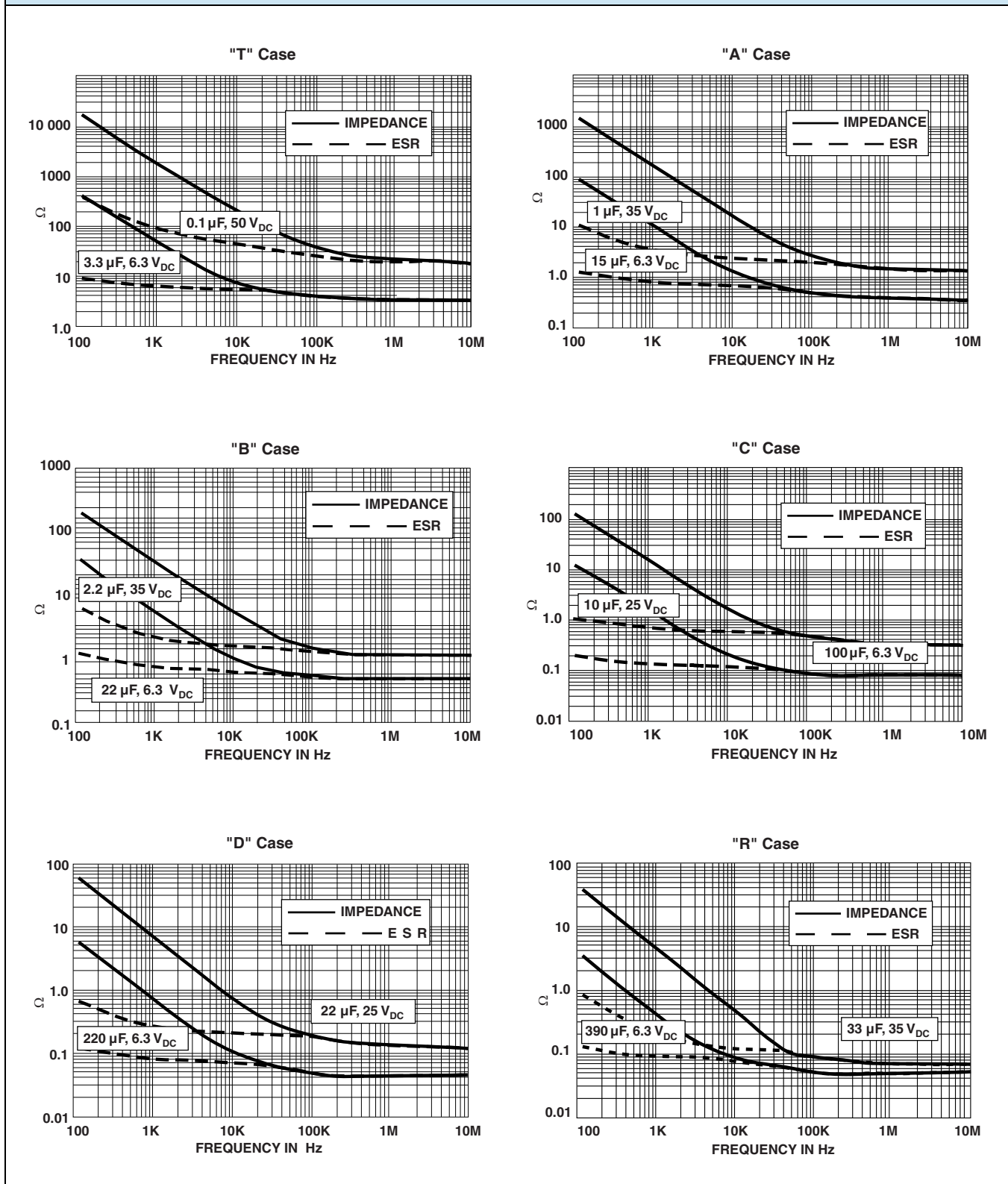
STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
4 WV_{DC} AT+ 85 °C, 2.7 WV_{DC} AT + 125 °C						
4.7	T	595D475X_004T2T	0.5	6	7.80	0.06
6.8	T	595D685X_004T2T	0.5	6	7.80	0.06
10	T	595D106X_004T2T	0.5	6	7.80	0.06
15	A	595D156X_004A2T	0.6	6	1.40	0.23
33	A	595D336X_004A2T	1.3	6	1.40	0.23
33	B	595D336X_004B2T	1.3	6	0.47	0.43
47	A	595D476X_004A2T	1.9	6	1.40	0.23
68	A	595D686X_004A2T	2.7	6	1.30	0.24
100	A	595D107X_004A2T	4.0	12	0.60	0.35
100	B	595D107X_004B2T	4.0	8	0.45	0.43
120	C	595D127X_004C2T	4.8	8	0.19	0.76
150	B	595D157X_004B2T	6.0	8	0.45	0.43
150	C	595D157X_004C2T	6.0	8	0.18	0.78
180	D	595D187X_004D2T	7.2	8	0.14	1.04
220	C	595D227X_004C2T	8.8	8	0.18	0.78
220	D	595D227X_004D2T	8.8	8	0.14	1.04
270	C	595D277X_004C2T	10.8	8	0.17	0.80
270	D	595D277X_004D2T	10.8	8	0.13	1.07
330	C	595D337X_004C2T	13.2	8	0.17	0.80
390	D	595D397X_004D2T	15.6	8	0.13	1.07
470	C	595D477X_004C2T	18.8	10	0.16	0.83
470	R	595D477X_004R2T	18.8	10	0.13	1.39
680	D	595D687X_004D2T	27.2	12	0.13	1.07
1000	R	595D108X_004R2T	40.0	16	0.07	1.89
1500	R	595D158X_004R2T	60.0	20	0.07	1.89
6.3 WV_{DC} AT + 85 °C, 4 WV_{DC} AT + 125 °C						
3.3	A	595D335X_6R3A2T	0.2	6	3.80	0.14
3.3	T	595D335X_6R3T2T	0.5	6	8.50	0.06
4.7	A	595D475X_6R3A2T	0.3	6	3.80	0.14
6.8	T	595D685X_6R3T2T	0.5	6	8.50	0.06
15	A	595D156X_6R3A2T	0.9	6	1.70	0.21
22	A	595D226X_6R3A2T	1.4	6	1.70	0.21
22	B	595D226X_6R3B2T	1.4	6	0.57	0.39
33	A	595D336X_6R3A2T	2.1	6	1.70	0.21
33	B	595D336X_6R3B2T	2.1	5	0.57	0.39
33	S	595D336X_6R3S2T	2.1	8	1.30	0.21
47	A	595D476X_6R3A2T	2.8	6	1.50	0.22
47	B	595D476X_6R3B2T	2.8	5	0.57	0.39
68	A	595D686X_6R3A2T	4.3	12	0.50	0.39
68	B	595D686X_6R3B2T	4.3	6	0.55	0.39
100	B	595D107X_6R3B2T	6.3	8	0.55	0.39
100	C	595D107X_6R3C2T	6.3	8	0.20	0.74
100	M	595D107X_6R3M2T	6.3	14	0.40	0.49
120	C	595D127X_6R3C2T	7.6	8	0.19	0.76
150	D	595D157X_6R3D2T	9.5	8	0.50	0.55
180	D	595D187X_6R3D2T	11.3	8	0.14	1.04
220	C	595D227X_6R3C2T	13.9	8	0.18	0.78
220	D	595D227X_6R3D2T	13.9	8	0.14	1.04
220	G	595D227X_6R3G2T	13.9	8	0.18	0.80
330	C	595D337X_6R3C2T	20.8	8	0.17	0.80
330	C	595D337X_6W3C2T	20.8	8	0.17	0.80
330	D	595D337X_6R3D2T	20.8	8	0.14	1.04
330	R	595D337X_6R3R2T	20.8	8	0.13	1.39

STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
6.3 WV_{DC} AT + 85 °C, 4 WV_{DC} AT + 125 °C						
390	R	595D397X_6R3R2T	24.6	8	0.13	1.39
470	D	595D477X_6R3D2T	29.6	8	0.13	1.07
470	D	595D477X_6W3D2T	29.6	10	0.12	1.12
470	R	595D477X_6R3R2T	29.6	10	0.12	1.44
560	R	595D567X_6R3R2T	35.3	10	0.11	1.51
680	R	595D687X_6R3R2T	42.8	10	0.09	1.67
680	R	595D687X_6W3R2T	42.8	10	0.09	1.67
1000	R	595D108X_6R3R2T	63.0	16	0.07	1.89
1000	R	595D108X_6W3R2T	63.0	16	0.07	1.89
10 WV_{DC} AT + 85 °C, 7 WV_{DC} AT + 125 °C						
2.2	T	595D225X_010T2T	0.5	6	8.60	0.06
3.3	A	595D335X_010A2T	0.5	6	3.80	0.14
4.7	A	595D475X_010A2T	0.5	6	3.60	0.14
4.7	T	595D475X_010T2T	0.5	6	8.60	0.06
6.8	A	595D685X_010A2T	0.7	6	3.60	0.14
10	A	595D106X_010A2T	1.0	6	1.90	0.20
15	A	595D156X_010A2T	1.5	6	1.80	0.20
15	B	595D156X_010B2T	1.5	6	0.67	0.36
22	A	595D226X_010A2T	2.2	6	1.80	0.20
22	B	595D226X_010B2T	2.2	6	1.90	0.21
33	A	595D336X_010A2T	3.3	8	3.00	0.16
33	B	595D336X_010B2T	3.3	6	1.90	0.21
47	B	595D476X_010B2T	4.7	6	0.65	0.36
47	C	595D476X_010C2T	4.7	6	0.30	0.61
68	B	595D686X_010B2T	6.8	6	0.65	0.36
68	C	595D686X_010C2T	6.8	6	0.24	0.68
100	B	595D107X_010B2T	10.0	12	0.40	0.46
100	C	595D107X_010C2T	10.0	8	0.20	0.74
100	D	595D107X_010D2T	8.0	7	0.15	1.00
120	C	595D127X_010C2T	12.0	7	0.22	0.71
120	D	595D127X_010D2T	12.0	8	0.14	1.04
150	C	595D157X_010C2T	15.0	8	0.22	0.71
150	D	595D157X_010D2T	15.0	8	0.14	1.04
180	D	595D187X_010D2T	18.0	7	0.38	0.63
180	R	595D187X_010R2T	18.0	8	0.13	1.39
220	C	595D227X_010C2T	22.0	8	0.20	0.74
220	D	595D227X_010D2T	22.0	8	0.14	1.04
220	R	595D227X_010R2T	22.0	8	0.13	1.39
270	R	595D277X_010R2T	27.0	8	0.13	1.39
330	D	595D337X_010D2T	33.0	8	0.14	1.04
330	R	595D337X_010R2T	33.0	8	0.13	1.39
390	R	595D397X_010R2T	39.0	8	0.12	1.44
470	R	595D477X_010R2T	47.0	8	0.12	1.44
680	R	595D687X_010R2T	68.0	14	0.09	1.67
16 WV_{DC} AT + 85 °C, 10 WV_{DC} AT + 125 °C						
1.5	T	595D155X_016T2T	0.5	6	8.70	0.06
2.2	T	595D225X_016T2T	0.5	6	8.70	0.06
2.2	A	595D225X_016A2T	0.4	5	3.90	0.14
3.3	T	595D335X_016T2T	0.5	6	8.60	0.06
4.7	A	595D475X_016A2T	0.8	6	2.90	0.16
6.8	A	595D685X_016A2T	1.1	6	2.80	0.16
10	A	595D106X_016A2T	1.6	6	2.50	0.17
10	B	595D106X_016B2T	1.6	6	0.76	0.33

STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
16 WV_{DC} AT + 85 °C, 10 WV_{DC} AT + 125 °C						
15	A	595D156X_016A2T	2.4	6	2.40	0.18
15	B	595D156X_016B2T	2.4	6	0.75	0.34
22	B	595D226X_016B2T	3.5	6	0.75	0.34
22	M	595D226X_016M2T	3.5	6	0.50	0.44
33	B	595D336X_016B2T	5.3	6	0.72	0.34
33	C	595D336X_016C2T	5.3	6	0.29	0.62
47	B	595D476X_016B2T	7.5	6	0.72	0.34
47	C	595D476X_016C2T	7.5	6	0.28	0.63
68	C	595D686X_016C2T	10.9	6	0.26	0.65
68	D	595D686X_016D2T	10.9	6	0.14	1.04
100	C	595D107X_016C2T	16.0	8	0.27	0.64
100	D	595D107X_016D2T	16.0	8	0.14	1.04
120	R	595D127X_016R2T	19.2	8	0.14	1.34
150	D	595D157X_016D2T	24.0	8	0.14	1.04
150	R	595D157X_016R2T	24.0	8	0.13	1.39
180	R	595D187X_016R2T	28.8	8	0.13	1.39
220	R	595D227X_016R2T	35.2	8	0.12	1.44
330	R	595D337X_016R2T	52.8	14	0.11	1.51
20 WV_{DC} AT + 85 °C, 13 WV_{DC} AT + 125 °C						
0.68	T	595D684X_020T2T	0.5	4	10.80	0.05
1	T	595D105X_020T2T	0.5	4	9.00	0.06
2.2	A	595D225X_020A2T	0.5	6	3.80	0.14
3.3	A	595D335X_020A2T	0.7	6	3.80	0.14
4.7	A	595D475X_020A2T	0.9	6	3.10	0.16
4.7	B	595D475X_020B2T	0.9	6	0.95	0.30
6.8	A	595D685X_020A2T	1.4	6	3.00	0.16
6.8	B	595D685X_020B2T	1.4	6	0.95	0.30
10	B	595D106X_020B2T	2.0	6	1.00	0.29
15	B	595D156X_020B2T	3.0	6	1.00	0.29
22	B	595D226X_020B2T	4.4	6	0.90	0.31
22	C	595D226X_020C2T	4.4	6	0.38	0.54
47	C	595D476X_020C2T	9.4	6	0.35	0.56
47	D	595D476X_020D2T	9.4	6	0.19	0.89
68	C	595D686X_020C2T	13.6	6	0.19	0.76
68	D	595D686X_020D2T	13.6	6	0.19	0.89
100	D	595D107X_020D2T	20.0	8	0.18	0.91
100	R	595D107X_020R2T	20.0	8	0.14	1.34
120	R	595D127X_020R2T	24.0	8	0.14	1.34
150	R	595D157X_020R2T	30.0	8	0.14	1.34
180	R	595D187X_020R2T	36.0	8	0.14	1.34
25 WV_{DC} AT + 85 °C, 17 WV_{DC} AT + 125 °C						
0.47	T	595D474X_025T2T	0.5	4	13.50	0.05
1	A	595D105X_025A2T	0.4	4	4.20	0.13
1.5	A	595D155X_025A2T	0.5	6	3.80	0.14
2.2	A	595D225X_025A2T	0.6	6	3.80	0.14
2.2	B	595D225X_025B2T	0.6	6	2.30	0.19
3.3	B	595D335X_025B2T	0.8	6	1.90	0.21
4.7	B	595D475_025B2T	1.2	6	1.80	0.22
4.7	C	595D475X_025C2T	1.3	5	0.68	0.40
6.8	B	595D685X_025B2T	1.7	6	1.50	0.24
10	B	595D106X_025B2T	2.5	6	1.50	0.24
10	C	595D106X_025C2T	2.5	6	0.57	0.44
15	C	595D156X_025C2T	3.8	6	0.56	0.44

STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (μ A)	MAX. DF AT + 25 °C 120 Hz (%)	MAX. ESR AT + 25 °C 100 kHz (Ω)	MAX. RIPPLE 100 kHz I_{RMS} (A)
25 WV_{DC} AT + 85 °C, 17 WV_{DC} AT + 125 °C						
22	C	595D226X_025C2T	5.5	6	0.50	0.47
22	D	595D226X_025D2T	5.5	6	0.28	0.73
33	C	595D336X_025C2T	8.3	6	0.45	0.49
33	D	595D336X_025D2T	8.3	6	0.27	0.75
47	D	595D476X_025D2T	11.8	6	0.26	0.76
47	R	595D476X_025R2T	11.8	6	0.20	1.12
68	D	595D686X_025D2T	17.0	8	0.26	0.76
68	R	595D686X_025R2T	17.0	6	0.20	1.12
100	R	595D107X_025R2T	25.0	8	0.20	1.12
35 WV_{DC} AT + 85 °C, 23 WV_{DC} AT + 125 °C						
0.33	T	595D334X_035T2T	0.5	4	14.40	0.05
0.47	A	595D474X_035A2T	0.5	4	4.30	0.13
0.68	A	595D684X_035A2T	0.5	4	4.20	0.13
1	A	595D105X_035A2T	0.5	4	4.10	0.14
1.5	A	595D155X_035A2T	0.5	6	3.80	0.14
1.5	B	595D155X_035B2T	0.5	6	2.80	0.17
2.2	B	595D225X_035B2T	0.8	6	2.30	0.19
3.3	B	595D335X_035B2T	1.2	6	2.40	0.19
3.3	C	595D335X_035C2T	1.2	6	0.75	0.38
4.7	B	595D475X_035B2T	1.6	6	2.20	0.20
4.7	C	595D475X_035C2T	1.6	6	0.66	0.41
6.8	C	595D685X_035C2T	2.4	6	0.63	0.42
10	D	595D106X_035D2T	3.5	6	0.43	0.59
15	C	595D156X_035C2T	5.3	6	0.60	0.43
15	D	595D156X_035D2T	5.3	6	0.41	0.60
22	D	595D226X_035D2T	7.7	6	0.32	0.68
22	R	595D226X_035R2T	7.7	6	0.28	0.94
33	R	595D336X_035R2T	11.6	6	0.28	0.94
47	R	595D476X_035R2T	16.5	6	0.28	0.94
50 WV_{DC} AT + 85 °C, 33 WV_{DC} AT + 125 °C						
0.1	T	595D104X_050T2T	0.5	4	22.50	0.04
0.15	T	595D154X_050T2T	0.5	4	18.00	0.04
0.22	A	595D224X_050A2T	0.5	4	9.00	0.09
0.22	T	595D224X_050T2T	0.5	4	15.30	0.04
0.33	A	595D334X_050A2T	0.5	4	8.10	0.10
0.47	A	595D474X_050A2T	0.5	4	7.20	0.10
0.68	A	595D684X_050A2T	0.5	4	6.10	0.11
0.68	B	595D684X_050B2T	0.5	4	5.40	0.13
1	A	595D105X_050A2T	0.5	4	6.00	0.11
1	B	595D105X_050B2T	0.5	4	5.00	0.13
1.5	B	595D155X_050B2T	0.8	6	4.10	0.14
1.5	C	595D155X_050C2T	0.8	6	1.80	0.25
2.2	B	595D225X_050B2T	1.1	6	3.20	0.16
2.2	C	595D225X_050C2T	1.1	6	1.70	0.25
3.3	C	595D335X_050C2T	1.7	6	1.60	0.26
4.7	C	595D475X_050C2T	2.4	6	1.40	0.28
6.8	C	595D685X_050C2T	3.4	6	1.30	0.29
6.8	D	595D685X_050D2T	3.4	6	0.82	0.43
10	D	595D106X_050D2T	5.0	6	0.80	0.43
10	R	595D106X_050R2T	5.0	6	0.65	0.62
15	R	595D156X_050R2T	7.5	6	0.40	0.79
22	R	595D226X_050R2T	11.0	6	0.39	0.80

TYPICAL CURVES AT + 25 °C, IMPEDANCE AND ESR VS. FREQUENCY



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.