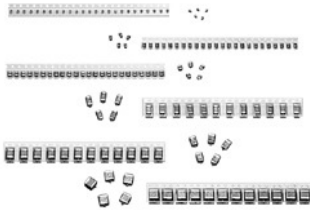


## Solid Tantalum Chip Capacitors, TANTAMOUNT<sup>®</sup>, Conformal Coated



### FEATURES

- 8 mm, 12 mm tape packaging to EIA-481-1 reeling per IEC 286-3. 7" (178 mm) standard 13" (330 mm) available
- US and European case sizes available
- Compliant to RoHS directive 2002/95/EC



Available  
**RoHS\***  
COMPLIANT

### PERFORMANCE/ELECTRICAL CHARACTERISTICS

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

**Note**

- Refer to Doc. 40088

**Capacitance Range:** 0.1 µF to 330 µF

**Capacitance Tolerance:** ± 10 %, ± 20 % standard

**Voltage Rating:** 4 WVDC to 50 WVDC

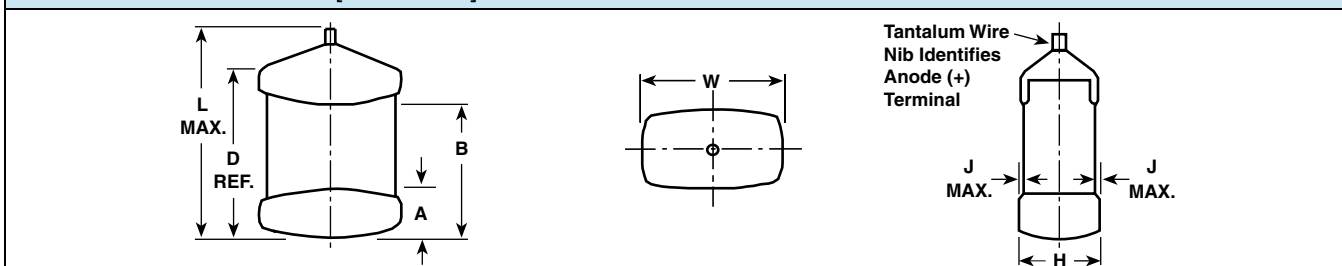
### ORDERING INFORMATION

195D TYPE	106 CAPACITANCE	X0 CAPACITANCE TOLERANCE	004 DC VOLTAGE RATING AT + 85 °C	S 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.	<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. A decimal point is indicated by an "R" (6R3 = 6.3 V).	See ratings and case codes table.	Style 2 is standard <b>2 = 100% tin</b> 4 = Gold plated 8 = Solder plated (60/40) Special order	<b>T = Tape and reel</b> <b>7" [178 mm] reel standard</b> <b>1/2" reel minimum</b> <b>13" [330 mm] reel available excluding the "R" case, on request.</b> See tape and reel specification

**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

### DIMENSIONS in inches [millimeters]



CASE CODE	L (MAX.)	W	H	A	B	D (REF.)	J (MAX.)
C	0.087 [2.21]	0.045 ± 0.010 [1.14 ± 0.25]	0.045 ± 0.010 [1.14 ± 0.25]	0.016 ± 0.008 [0.40 ± 0.20]	0.042 ± 0.010 [1.07 ± 0.25]	0.063 [1.60]	0.004 [0.10]
R	0.283 [7.2]	0.235 + 0.012/- 0.024 [6.0 + 0.3/- 0.6]	0.136 ± 0.012 [3.5 ± 0.3]	0.051 ± 0.012 [1.3 ± 0.3]	0.180 ± 0.025 [4.6 ± 0.6]	0.243 [6.20]	0.004 [0.10]
S	0.143 [3.63]	0.072 ± 0.008 [1.83 ± 0.20]	0.048 ± 0.008 [1.22 ± 0.20]	0.023 ± 0.010 [0.58 ± 0.25]	0.085 ± 0.015 [2.16 ± 0.37]	0.115 [2.90]	0.004 [0.10]
V	0.143 [3.63]	0.104 ± 0.010 [2.65 ± 0.25]	0.051 ± 0.010 [1.30 ± 0.25]	0.023 ± 0.010 [0.58 ± 0.25]	0.085 ± 0.015 [2.16 ± 0.37]	0.115 [2.90]	0.004 [0.10]
X	0.285 [7.24]	0.104 ± 0.010 [2.65 ± 0.25]	0.051 ± 0.010 [1.30 ± 0.25]	0.040 ± 0.020 [1.00 ± 0.50]	0.200 ± 0.027 [5.08 ± 0.69]	0.243 [6.20]	0.004 [0.10]
Y	0.285 [7.24]	0.104 ± 0.010 [2.65 ± 0.25]	0.069 ± 0.010 [1.75 ± 0.25]	0.040 ± 0.020 [1.00 ± 0.50]	0.200 ± 0.027 [5.08 ± 0.69]	0.243 [6.20]	0.004 [0.10]
Z	0.285 [7.24]	0.104 ± 0.010 [2.65 ± 0.25]	0.104 ± 0.010 [2.65 ± 0.25]	0.040 ± 0.020 [1.00 ± 0.50]	0.200 ± 0.023 [5.08 ± 0.59]	0.243 [6.20]	0.004 [0.10]

**Note**

- The anode termination (D less B) will be a minimum of 0.010" (0.25 mm), C case = 0.005" (0.131 mm) minimum
- \* Pb containing terminations are not RoHS compliant, exemptions may apply



RATINGS AND CASE CODES								
μF	4 V	6.3 V	10 V	16 V	20 V	25 V	35 V	50 V
0.10								C
0.15								C
0.22			S					C/S
0.33							C	S
0.47						C	S	V
0.68					C	S	S	V
1.0			S	C	S	S	S	X
1.5			C	S	S	S	V	X
2.2		C	S	S	S	V	X	Y
3.3	C	S	S	S	V	X	Y	Z
4.7	S	S	S	V	X	X	Z	Z
6.8	S	S	V	X	X	Y	Z	R
10	S	V	X	X	Y	Y	Z	R
15	V	X	X	Y	Z	Z	R	
22	X	X	Y	Y/Z	Z	R	R	
33	X	Y	Z	Z	R	R		
47	Y	Y	Z	R	R			
68	Y	Z	R	R				
100	Z	Z	R					
120	R	R	R					
150	R	R	R					
180	R	R						
220	R	R						
330	R							

STANDARD RATINGS					
CAPACITANCE (μF)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)	
<b>4 WVDC AT + 85 °C, 2.7 WVDC AT + 125 °C</b>					
3.3	C	195D335X_004C2T	0.5	6	
4.7	S	195D475X_004S2T	0.5	6	
6.8	S	195D685X_004S2T	0.5	6	
10	S	195D106X_004S2T	0.5	6	
15	V	195D156X_004V2T	0.6	6	
22	X	195D226X_004X2T	0.9	6	
33	X	195D336X_004X2T	1.3	6	
47	Y	195D476X_004Y2T	1.9	6	
68	Y	195D686X_004Y2T	2.7	6	
100	Z	195D107X_004Z2T	4.0	8	
120	R	195D127X_004R2T	4.8	8	
150	R	195D157X_004R2T	6.0	8	
180	R	195D187X_004R2T	7.2	8	
220	R	195D227X_004R2T	8.8	8	
330	R	195D337X_004R2T	13.2	8	
<b>6.3 WVDC AT + 85 °C, 4 WVDC AT + 125 °C</b>					
2.2	C	195D225X_6R3C2T	0.5	6	
3.3	S	195D335X_6R3S2T	0.5	6	
4.7	S	195D475X_6R3S2T	0.5	6	
6.8	S	195D685X_6R3S2T	0.5	6	

**Note**

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

<b>STANDARD RATINGS</b>				
CAPACITANCE (μF)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)
<b>6.3 WVDC AT + 85 °C, 4 WVDC AT + 125 °C</b>				
10	V	195D106X_6R3V2T	0.6	6
15	X	195D156X_6R3X2T	0.9	6
22	X	195D226X_6R3X2T	1.3	6
33	Y	195D336X_6R3Y2T	2.0	6
47	Y	195D476X_6R3Y2T	2.8	6
68	Z	195D686X_6R3Z2T	4.1	6
100	Z	195D107X_6R3Z2T	6.0	8
120	R	195D127X_6R3R2T	7.2	8
150	R	195D157X_6R3R2T	9.0	8
180	R	195D187X_6R3R2T	10.8	8
220	R	195D227X_6R3R2T	13.2	8
<b>10 WVDC AT + 85 °C, 7 WVDC AT + 125 °C</b>				
0.22	S	195D224X_010S2T	0.5	4
1	S	195D105X_010S2T	0.4	6
1.5	C	195D155X_010C2T	0.5	6
2.2	S	195D225X_010S2T	0.5	6
3.3	S	195D335X_010S2T	0.5	6
4.7	S	195D475X_010S2T	0.5	6
6.8	V	195D685X_010V2T	0.7	6
10	X	195D106X_010X2T	1.0	6
15	X	195D156X_010X2T	1.5	6
22	Y	195D226X_010Y2T	2.2	6
33	Z	195D336X_010Z2T	3.0	6
47	Z	195D476X_010Z2T	4.7	6
68	R	195D686X_010R2T	6.8	6
100	R	195D107X_010R2T	10	8
120	R	195D127X_010R2T	12	8
150	R	195D157X_010R2T	15	8
<b>16 WVDC AT + 85 °C, 10 WVDC AT + 125 °C</b>				
1.0	C	195D105X_016C2T	0.5	4
1.5	S	195D155X_016S2T	0.5	6
2.2	S	195D225X_016S2T	0.5	6
3.3	S	195D335X_016S2T	0.5	6
4.7	V	195D475X_016V2T	0.7	6
6.8	X	195D685X_016X2T	1.0	6
10	X	195D106X_016X2T	1.5	6
15	Y	195D156X_016Y2T	2.3	6
22	Y	195D226X_016Y2T	3.2	6
22	Z	195D226X_016Z2T	3.3	6
33	Z	195D336X_016Z2T	5.0	6
47	R	195D476X_016R2T	7.1	6
68	R	195D686X_016R2T	10.2	6
<b>20 WVDC AT + 85 °C, 13 WVDC AT + 125 °C</b>				
0.68	C	195D684X_020C2T	0.5	4
1.0	S	195D105X_020S2T	0.5	4
1.5	S	195D155X_020S2T	0.5	6
2.2	S	195D225X_020S2T	0.5	6
3.3	V	195D335X_020V2T	0.7	6
4.7	X	195D475X_020X2T	0.9	6
6.8	X	195D685X_020X2T	1.4	6

**Note**

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

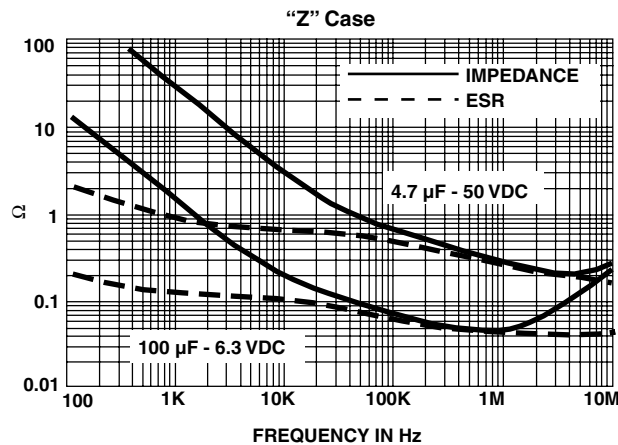
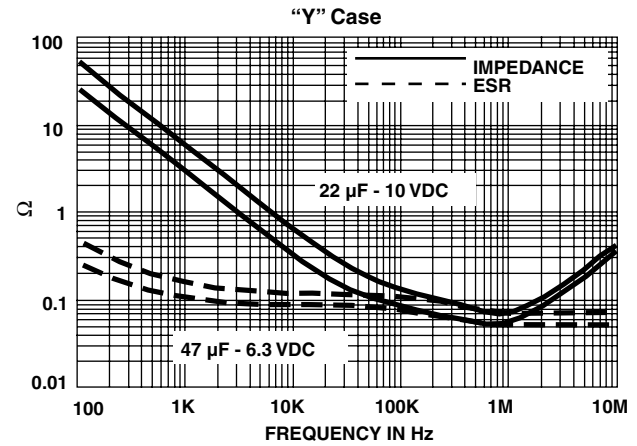
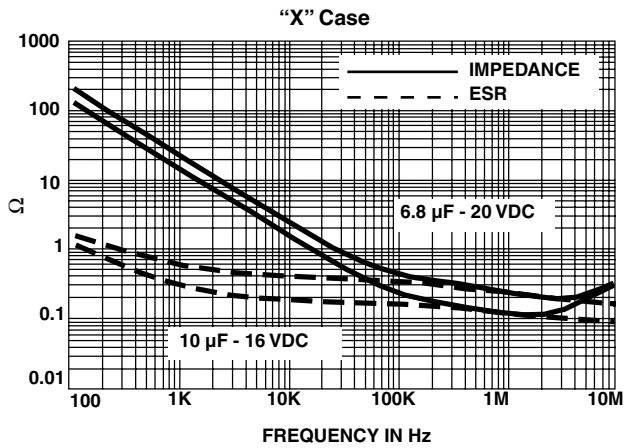
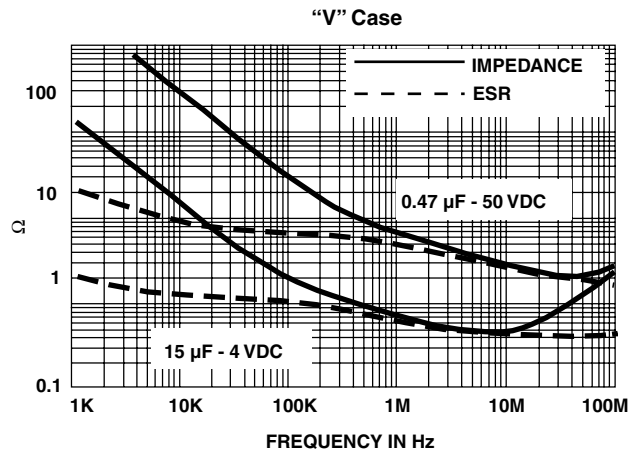
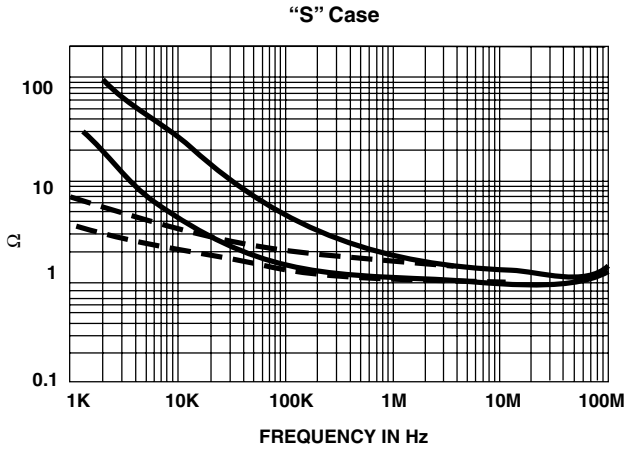


<b>STANDARD RATINGS</b>				
CAPACITANCE (μF)	CASE CODE	PART NUMBER (1)	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)
<b>20 WVDC AT + 85 °C, 13 WVDC AT + 125 °C</b>				
10	Y	195D106X_020Y2T	2.0	6
15	Z	195D156X_020Z2T	3.0	6
22	Z	195D226X_020Z2T	4.4	6
33	R	195D336X_020R2T	6.6	6
47	R	195D476X_020R2T	9.4	6
<b>25 WVDC AT + 85 °C, 17 WVDC AT + 125 °C</b>				
0.47	C	195D474X_025C2T	0.5	4
0.68	S	195D684X_025S2T	0.5	4
1.0	S	195D105X_025S2T	0.5	4
1.5	S	195D155X_025S2T	0.5	6
2.2	V	195D225X_025V2T	0.6	6
3.3	X	195D335X_025X2T	0.8	6
4.7	X	195D475X_025X2T	1.2	6
6.8	Y	195D685X_025Y2T	1.7	6
10	Y	195D106X_025Y2T	2.5	6
15	Z	195D156X_025Z2T	3.8	6
22	R	195D226X_025R2T	5.5	6
33	R	195D336X_025R2T	8.3	6
<b>35 WVDC AT + 85 °C, 23 WVDC AT + 125 °C</b>				
0.33	C	195D334X_035C2T	0.5	4
0.47	S	195D474X_035S2T	0.5	4
0.68	S	195D684X_035S2T	0.5	4
1.0	S	195D105X_035S2T	0.5	4
1.5	V	195D155X_035V2T	0.5	6
2.2	X	195D225X_035X2T	0.8	6
3.3	Y	195D335X_035Y2T	1.2	6
4.7	Z	195D475X_035Z2T	1.6	6
6.8	Z	195D685X_035Z2T	2.4	6
10	Z	195D106X_035Z2T	3.5	6
15	R	195D156X_035R2T	5.3	6
22	R	195D226X_035R2T	7.7	6
<b>50 WVDC AT + 85 °C, 33 WVDC AT + 125 °C</b>				
0.1	C	195D104X_050C2T	0.5	4
0.15	C	195D154X_050C2T	0.5	4
0.22	C	195D224X_050C2T	0.5	4
0.22	S	195D224X_050S2T	0.4	4
0.33	S	195D334X_050S2T	0.5	4
0.47	V	195D474X_050V2T	0.5	4
0.68	V	195D684X_050V2T	0.5	4
1.0	X	195D105X_050X2T	0.5	4
1.5	X	195D155X_050X2T	0.8	6
2.2	Y	195D225X_050Y2T	1.1	6
3.3	Z	195D335X_050Z2T	1.7	6
4.7	Z	195D475X_050Z2T	2.4	6
6.8	R	195D685X_050R2T	3.4	6
10	R	195D106X_050R2T	5.0	6

**Note**

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

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

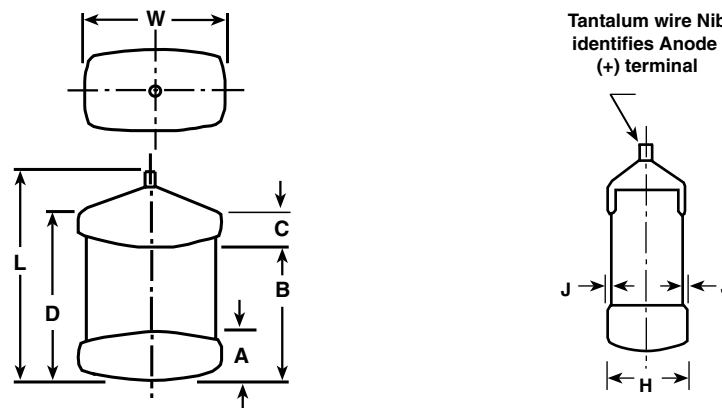


**ORDERING INFORMATION - EUROPEAN USE ONLY**

195D TYPE	106 CAPACITANCE	X0 CAPACITANCE TOLERANCE	004 DC VOLTAGE RATING AT + 85 °C	D 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.	<b>X0 = ± 20 %</b> <b>X9 = ± 10 %</b>	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	Style 2 is standard <b>2 = 100 % Tin</b> 4 = Gold plated 8 = Solder plated (60/40) Special order	<b>T = Tape and reel</b> <b>180 mm reel standard</b> 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.

**DIMENSIONS** in millimeters


CASE CODE	L ± 0.3	W ± 0.3	H (MAX.)	A ± 0.3	B ± 0.3	C (MIN.)
A	2.8 ± 0.2	1.5	1.4	0.7	1.6	0.3
B	4.2 ± 0.2	1.4	1.6	0.8	2.5	0.3
D	4.2 ± 0.2	2.1	1.6	0.8	2.5	0.5
E	5.5	2.1	1.7	1.0	3.2	0.8
F	5.0	3.3	2.0	1.0	3.6	0.8
G	7.0	2.6	2.8	1.0	4.5	0.8
H	7.8	3.7	3.0	1.0	5.0	0.8

**Note**

- The anode termination (D less B) will be a minimum of 0.010 (0.25), C Case = 0.005 (0.131) minimum

**195D STANDARD RANGE, RATINGS AND CASE CODES**

µF	2 V	4 V	6.3 V	10 V	15 V	20 V	25 V	35/40 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	D
0.68					A		B	D	D
1.0				A	B	B		D	E
1.5			A		B		D	E	F
2.2		A		B		D	E	F	F
3.3	A		B		D	E		F	G
4.7	A	B		D	E		F	G	H
6.8	A		D	E		F	G	H	

**195D STANDARD RANGE, RATINGS AND CASE CODES**

μF	2 V	4 V	6.3 V	10 V	15 V	20 V	25 V	35/40 V	50 V
10	A	D	E		F		G		
15		E		F		G	H		
22			F		G	H			
33		F		G	H				
47			G	H					
68		G	H						
100		H		H					

**STANDARD RATINGS**

CAPACITANCE (μF)	CASE CODE	PART NUMBER <sup>(1)</sup>	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)
<b>2 WVDC AT + 85 °C, 1.2 WVDC AT + 125 °C</b>				
3.3	A	195D335X_002A2T	0.5	8
4.7	A	195D475X_002A2T	0.5	8
6.8	A	195D685X_002A2T	0.5	8
10	A	195D106X_002A2T	0.6	8
<b>4 WVDC AT + 85 °C, 2.7 WVDC AT + 125 °C</b>				
2.2	A	195D225X_004A2T	0.5	8
4.7	B	195D475X_004B2T	0.5	8
10	D	195D106X_004D2T	0.5	8
15	E	195D156X_004E2T	0.6	8
33	F	195D336X_004F2T	1.3	8
68	G	195D686X_004G2T	2.7	8
100	H	195D107X_004H2T	4.0	8
<b>6.3 WVDC AT + 85 °C, 4 WVDC AT + 125 °C</b>				
1.5	A	195D155X_6R3A2T	0.5	8
3.3	B	195D335X_6R3B2T	0.5	8
6.8	D	195D685X_6R3D2T	0.5	8
10	E	195D106X_6R3E2T	0.6	8
22	F	195D226X_6R3F2T	1.3	8
47	G	195D476X_6R3G2T	2.8	8
68	H	195D686X_6R3H2T	4.1	8
<b>10 WVDC AT + 85 °C, 7 WVDC AT + 125 °C</b>				
1.0	A	195D105X_010A2T	0.5	6
2.2	B	195D225X_010B2T	0.5	6
4.7	D	195D475X_010D2T	0.5	6
6.8	E	195D685X_010E2T	0.7	6
15	F	195D156X_010F2T	1.5	6
47	H	195D476X_010H2T	4.7	6
100	H	195D107X_010H2T	8.0	7
<b>15 WVDC AT + 85 °C, 10 WVDC AT + 125 °C</b>				
0.47	A	195D474X_015A2T	0.5	6
0.68	A	195D684X_015A2T	0.5	6
1.0	B	195D105X_015B2T	0.5	6
1.5	B	195D155X_015B2T	0.5	6
3.3	D	195D335X_015D2T	0.5	6
4.7	E	195D475X_015E2T	0.7	6
10	F	195D106X_015F2T	1.5	6
22	G	195D226X_015G2T	3.3	6
33	H	195D336X_015H2T	5.0	6

**Note**

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



<b>STANDARD RATINGS</b>					
CAPACITANCE (μF)	CASE CODE	PART NUMBER <sup>(1)</sup>	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)	
<b>16 WVDC AT + 85 °C, 10 WVDC AT + 125 °C</b>					
0.47	A	195D474X_015A2T	0.5	6	
0.68	A	195D684X_015A2T	0.5	6	
1.0	B	195D105X_015B2T	0.5	6	
1.5	B	195D155X_015B2T	0.5	6	
3.3	D	195D335X_015D2T	0.5	6	
4.7	E	195D475X_015E2T	0.7	6	
10	F	195D106X_015F2T	1.5	6	
22	G	195D226X_015G2T	3.3	6	
33	H	195D336X_015H2T	5.0	6	
<b>20 WVDC AT + 85 °C, 13 WVDC AT + 125 °C</b>					
0.47	A	195D474X_020A2T	0.5	6	
1.0	B	195D105X_020B2T	0.5	6	
2.2	D	195D225X_020D2T	0.5	6	
3.3	E	195D335X_020E2T	0.7	6	
6.8	F	195D685X_020F2T	1.4	6	
15	G	195D156X_020G2T	3.0	6	
22	H	195D226X_020H2T	4.4	6	
<b>25 WVDC AT + 85 °C, 17 WVDC AT + 125 °C</b>					
0.33	A	195D334X_025A2T	0.5	6	
0.68	B	195D684X_025B2T	0.5	6	
1.5	D	195D155X_025D2T	0.5	6	
2.2	E	195D225X_025E2T	0.6	6	
4.7	F	195D475X_025F2T	1.2	6	
6.8	G	195D685X_025G2T	1.7	6	
10	G	195D106X_025G2T	2.5	6	
15	H	195D156X_025H2T	3.8	6	
<b>35 WVDC AT + 85 °C, 23 WVDC TO 25 WVDC AT + 125 °C</b>					
0.10	A	195D104X_035A2T	0.5	6	
0.15	A	195D154X_035A2T	0.5	6	
0.22	A	195D224X_035A2T	0.5	6	
0.33	B	195D334X_035B2T	0.5	6	
0.47	B	195D474X_035B2T	0.5	6	
0.68	D	195D684X_035D2T	0.5	6	
1.0	D	195D105X_035D2T	0.5	6	
1.5	E	195D155X_035E2T	0.5	6	
2.2	F	195D225X_035F2T	0.8	6	
3.3	F	195D335X_035F2T	1.2	6	
4.7	G	195D475X_035G2T	1.6	6	
6.8	H	195D685X_035H2T	2.4	6	

**Note**

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





<b>STANDARD RATINGS</b>				
CAPACITANCE (μF)	CASE CODE	PART NUMBER <sup>(1)</sup>	MAX. DCL AT + 25 °C (μA)	MAX. DF AT + 25 °C 120 Hz (%)
<b>40 WVDC AT + 85 °C, 23 WVDC TO 25 WVDC AT + 125 °C</b>				
0.10	A	195D104X_035A2T	0.5	6
0.15	A	195D154X_035A2T	0.5	6
0.22	A	195D224X_035A2T	0.5	6
0.33	B	195D334X_035B2T	0.5	6
0.47	B	195D474X_035B2T	0.5	6
0.68	D	195D684X_035D2T	0.5	6
1.0	D	195D105X_035D2T	0.5	6
1.5	E	195D155X_035E2T	0.5	6
2.2	F	195D225X_035F2T	0.8	6
3.3	F	195D335X_035F2T	1.2	6
4.7	G	195D475X_035G2T	1.6	6
6.8	H	195D685X_035H2T	2.4	6
<b>50 WVDC AT + 85 °C, 33 WVDC AT + 125 °C</b>				
0.10	A	195D104X_050A2T	0.5	6
0.15	A	195D154X_050A2T	0.5	6
0.22	B	195D224X_050B2T	0.5	6
0.33	B	195D334X_050B2T	0.5	6
0.47	D	195D474X_050D2T	0.5	6
0.68	D	195D684X_050D2T	0.5	6
1.0	E	195D105X_050E2T	0.5	6
1.5	F	195D155X_050F2T	0.8	6
2.2	F	195D225X_050F2T	1.1	6
3.3	G	195D335X_050G2T	1.7	6
4.7	H	195D475X_050H2T	2.4	6

**Note**

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



## 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.