

195D

Vishay Sprague



Solid Tantalum Chip Capacitors TANTAMOUNT® 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



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 µF to 330 µF

Capacitance Tolerance: ± 10 %, ± 20 % standard

Voltage Rating: 2 WVDC to 50 WVDC

ORDERING INFORMATION

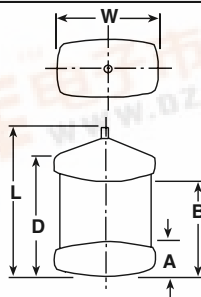
195D	106	X0	004	S	2	T
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	CASE CODE	TERMINATION	PACKAGING
This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	X0 = ± 20 % X9 = ± 10 %	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 volts).	See Ratings and Case Codes Table	Style 2 is standard 2 = 100 % Tin 4 = Gold Plated 8 = Solder Plated (60/40) Special Order	T = Tape and Reel 7" [178 mm] Reel standard 1/2" Reel minimum 13" [330] Reel available excluding the "R" case, on request. 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

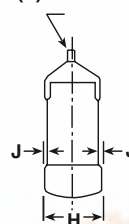
Note: Preferred Tolerance and reel sizes are in bold.

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]



Tantalum Wire Nib
Identifies Anode
(+) Terminal



CASE CODE	EIA SIZE	L (Max.)	W	H	A	B	D (Ref.)	J (Max.)
C	N / A	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	7257	0.283 [7.2]	0.235 ± 0.012 [6.0 ± 0.3]	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	3518	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	3527	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	7227	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	7227	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	7227	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), C Case = 0.005 (0.131) minimum

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

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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								C
0.33							C	S
0.47						C	S	V
0.68					C	S	S	V
1.0				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	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*	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
4 WVDC AT + 85 °C, SURGE = 5 V . . . 2.7 WVDC AT + 125 °C, SURGE = 3.4 V				
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

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

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STANDARD RATINGS				
CAPACITANCE (μF)	CASE CODE	PART NUMBER*	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
6.3 WVDC AT + 85 °C, SURGE = 8 V . . . 4 WVDC AT + 125 °C, SURGE = 5 V				
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
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
10 WVDC AT + 85 °C, SURGE = 13V . . . 7 WVDC AT + 125 °C, SURGE = 9 V				
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
16 WVDC AT + 85 °C, SURGE = 20 V . . . 10 WVDC AT + 125 °C, SURGE = 12 V				
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	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

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

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CAPACITANCE (μF)	CASE CODE	PART NUMBER*	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
20 WVDC AT + 85 °C, SURGE = 26 V . . . 13 WVDC AT + 125 °C, SURGE = 16 V				
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
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
25 WVDC AT + 85 °C, SURGE = 32 V . . . 17 WVDC AT + 125 °C, SURGE = 20 V				
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
35 WVDC AT + 85 °C, SURGE = 46 V . . . 23 WVDC AT + 125 °C, SURGE = 28 V				
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

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

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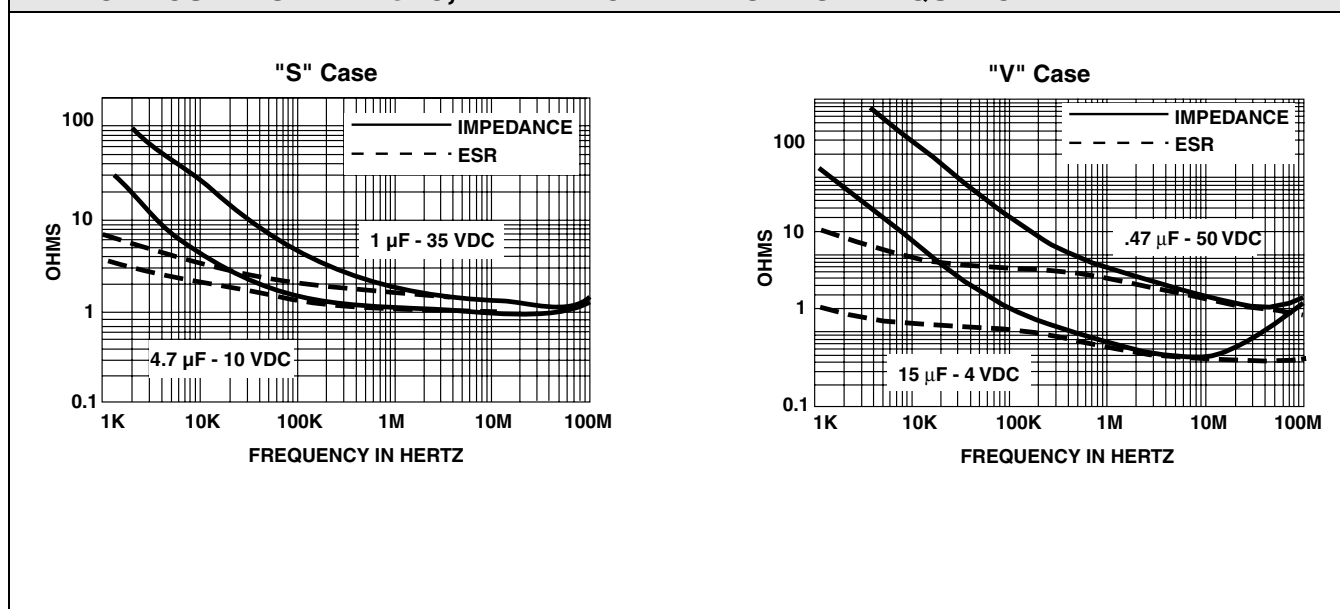


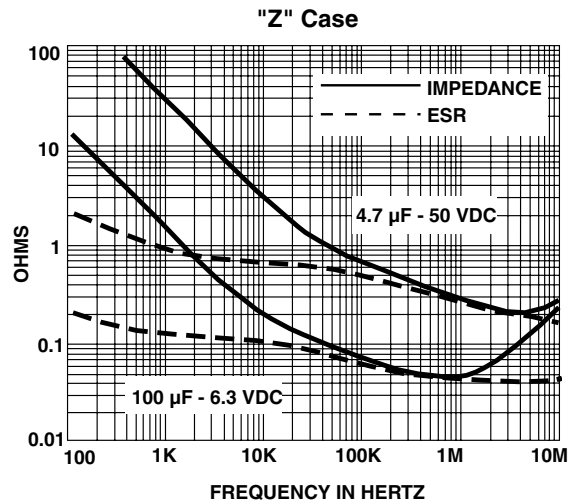
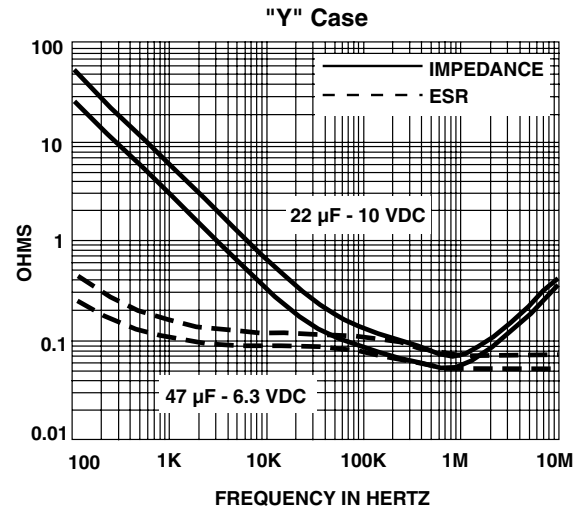
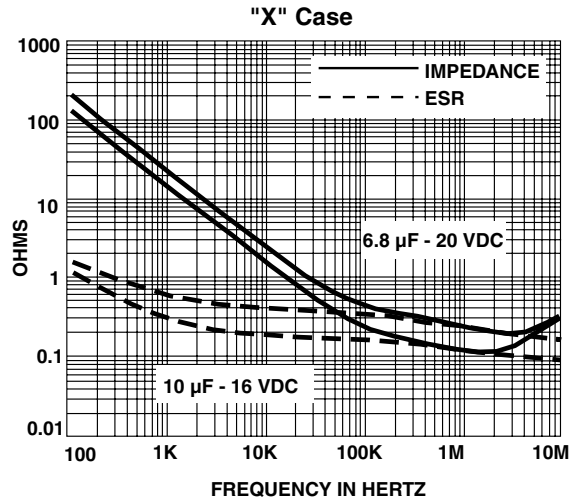
STANDARD RATINGS

CAPACITANCE (μF)	CASE CODE	PART NUMBER*	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
50 WVDC AT + 85 °C, SURGE = 65 V . . . 33 WVDC AT + 125 °C, SURGE = 38 V				
0.1	C	195D104X_050C2T	0.5	4
0.15	C	195D154X_050C2T	0.5	4
0.22	C	195D224X_050C2T	0.5	4
0.33	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

For 10 % tolerance, specify "9": for 20 % tolerance, change to "0".

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



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

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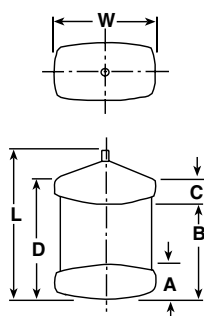
ORDERING INFORMATION - EUROPEAN USE ONLY

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.	X0 = ± 20 % X9 = ± 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 volts).	See Ratings and Case Codes Table	Style 2 is standard 2 = Solderable Coating 4 = Gold Plated 8 = Solder Plated (60/40) Special Order	T = Tape and Reel 180 mm Reel standard See Tape and Reel Specifications.

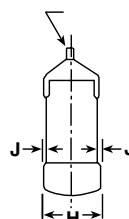
Note: Preferred Tolerance and reel sizes are in bold.

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 millimeters



Tantalum Wire Nib
Identifies Anode
(+) Terminal



CASE CODE	L ± 0.3	W ± 0.3	H (max)	A ± 0.3	B ± 0.3	C (min)
A	2.8*	1.5	1.4	0.7	1.6	0.3
B	4.2*	1.4	1.6	0.8	2.5	0.3
D	4.2*	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

* ± 0.2

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

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195D STANDARD RANGE, RATINGS AND CASE CODES

μF	2 V	4 V	6.3 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	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	
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							

STANDARD RATINGS

CAPACITANCE (μF)	CASE CODE	PART NUMBER	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
2 WVDC AT + 85 °C, SURGE = 2.6 V . . . 1.2 WVDC AT + 125 °C, SURGE = 1.6 V				
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
4 WVDC AT + 85 °C, SURGE = 5 V . . . 2.7 WVDC AT + 125 °C, SURGE = 3.4 V				
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_004H2E	4.0	8
6.3 WVDC AT + 85 °C, SURGE = 8 V . . . 4 WVDC AT + 125 °C, SURGE = 5 V				
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_6R3H2E	4.1	8

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

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STANDARD RATINGS				
CAPACITANCE (μF)	CASE CODE	PART NUMBER	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
10 WVDC AT + 85 °C, SURGE = 13 V . . . 7 WVDC AT + 125 °C, SURGE = 9 V				
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_010H2E	4.7	6
15 / 16 WVDC AT + 85 °C, SURGE = 20 V...10 WVDC AT + 125 °C, SURGE = 12 V				
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_015H2E	5.0	6
20 WVDC AT + 85 °C, SURGE = 26 V . . . 13 WVDC AT + 125 °C, SURGE = 16 V				
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_020H2E	4.4	6
25 WVDC AT + 85 °C, SURGE = 32 V . . . 17 WVDC AT + 125 °C, SURGE = 20 V				
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_025H2E	3.8	6

For 10 % tolerance, specify "9": for 20 % tolerance, change to "0".

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STANDARD RATINGS				
CAPACITANCE (μF)	CASE CODE	PART NUMBER	Max. DCL at + 25 °C (μA)	Max. DF at + 25 °C 120 Hz (%)
35 WVDC AT + 85 °C, SURGE = 46 / 52 V . . 23 / 25 WVDC AT + 125 °C, SURGE = 28 / 30 V				
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_035H2E	2.4	6
50 WVDC AT + 85 °C, SURGE = 65 V . . . 33 WVDC AT + 125 °C, SURGE = 38 V				
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_050H2E	2.4	6

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



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