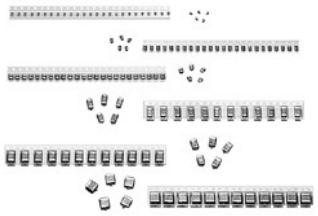
195D

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

Pb-free Available

RoHS* COMPLIANT

PERFORMANCE CHARACTERISTICS

Operating Temperature: - 55 °C to + 85 °C
(To + 125 °C with voltage derating)
NOTE: Refer to Doc 40088

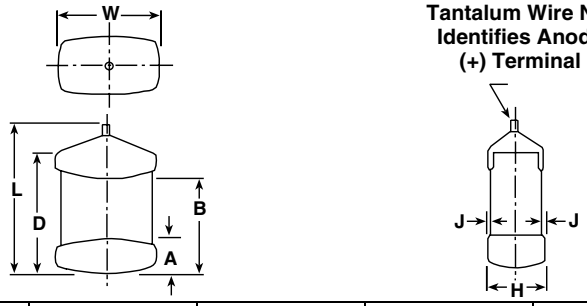
Capacitance Range: 0.1 µF to 330 µF
Capacitance Tolerance: ± 10 %, ± 20 % standard
Voltage Rating: 2 WVDC to 50 WVDC

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 case size. Voltage substitutions will be marked with the higher voltage rating.

DIMENSIONS in inches [millimeters]



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 nor 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								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“.

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“.

STANDARD RATINGS

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

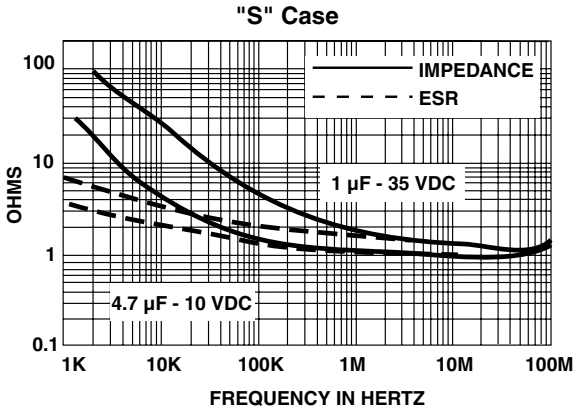
For 10 % tolerance, specify “9“: for 20 % tolerance, change to “0“.

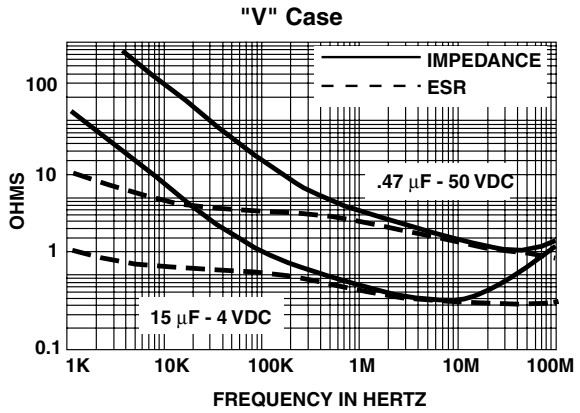
STANDARD RATINGS

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“.

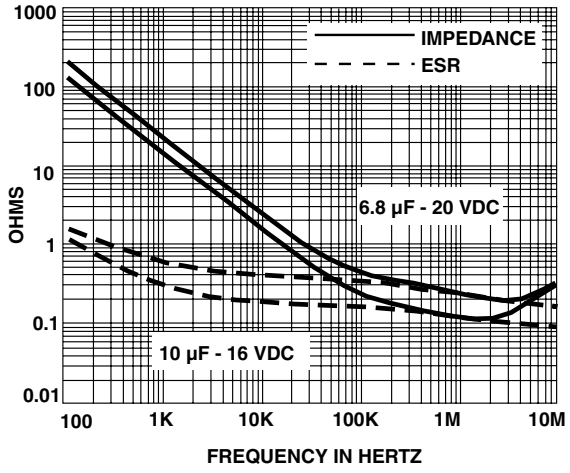
TYPICAL CURVES AT + 25 °C, IMPEDANCE AND ESR VS. FREQUENCY



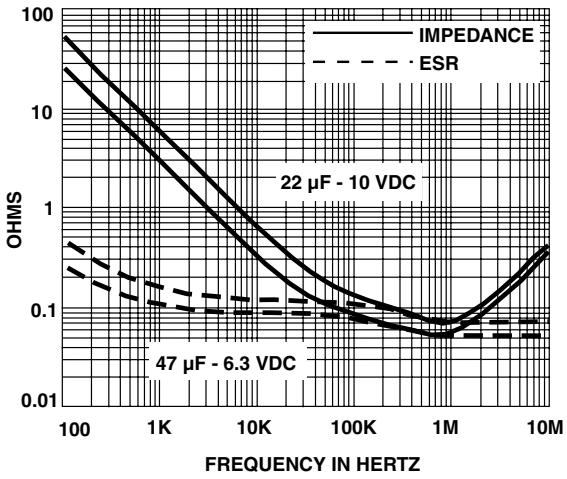


TYPICAL CURVES AT + 25 °C, IMPEDANCE AND ESR VS. FREQUENCY

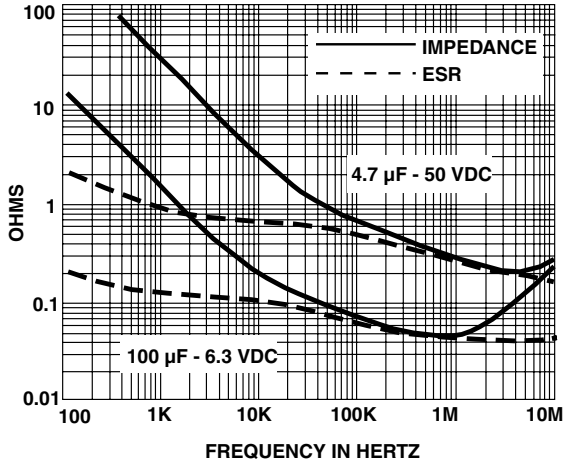
"X" Case



"Y" Case



"Z" Case

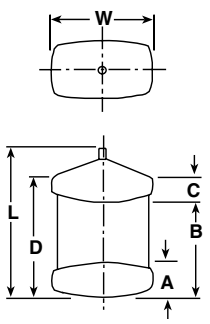


ORDERING INFORMATION - EUROPEAN USE ONLY

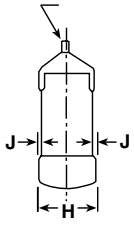
195D	106	X0	004	D	2	T
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	CASE CODE	TERMINATION	PACKAGING
	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	**X0 = ± 20 %** X9 = ± 10 %	This is expressed in volts. 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 = 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

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“.

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“.

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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