



Capacitors

AC Safety, SMT - (UL / TUV Certified)

X1, X2 and Y2 Capacitor Type Safety ceramic chip are designed for AC voltage surge and lightning protection in line-to-ground interface applications in computer networks, modem, facsimile and other equipment. Johanson Dielectric's safety capacitor offering includes four different case sizes and NPO and X7R dielectric materials. These devices are surface mount ready with barrier terminations and tape and reel packaging. Information on capacitor safety ratings and certification details may be found below.

General Specifications:

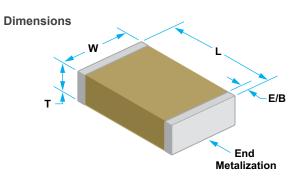
Case Sizes: 1808 - 2220

Safety Ratings: X2, X1/Y2, Y2

· Dielectrics Type: NPO, X7R

• Capacitance Range: 2.4 pF - 4700 pF

Polyterm® soft termination option for demanding environments & processes available on select parts, please contact the factory.



Safety Ratings

Safety Rating	Voltage Rating	Withstanding Voltage	Impulse Voltage	Case Size		
X2	250 VAC	1,500 VAC	2,500 V	1808		
STANDA	ARDS: IEC/EN 60384-14:2013	3+A1:2016 • CERTIFICATION	NS: TUV T 72210484 • UL File	e E472557		
X2	250 VAC	1812				
STANDA	ARDS: IEC/EN 60384-14:2013	3+A1:2016 • CERTIFICATION	NS: TUV T 72210484 • UL File	e E472557		
X1/Y2	250 VAC	5,000 V	1808			
STANDA	ARDS: IEC/EN 60384-14:2013	- B+A1:2016 • CERTIFICATION	NS: TUV T 72210484 • UL File	e E472557		
X1/Y2	250 VAC	1,500 VAC	5,000 V	1812		
STANDA	ARDS: IEC/EN 60384-14:2013	3+A1:2016 • CERTIFICATION	NS: TUV T 72210484 • UL File	e E472557		
X1/Y2	250 VAC	1,500 VAC	5,000 V	2211		
STANDA	ARDS: IEC/EN 60384-14:2013	 B+A1:2016 • CERTIFICATION	 NS: TUV T 72210484 • UL File	e E472557		
X1/Y2	250 VAC	1,500 VAC	5,000 V	2220		
CTAND	 ARDS: IEC/EN 60384-14:2013	, A 1-2016 - CERTIFICATION	·	- 5470557		

- X Capacitors are defined as suitable for use in situations where failure of the capacitor would not lead to danger of electric shock.
- Y Capacitors are defined as suitable for use in situations where failure of the capacitor could lead to danger of electric shock.





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Electrical Characteristics

Parameter	NPO	X7R								
	0 ± 30 ppm/°C -55 to + 125°C	± 15% -55 to + 125°C								
Temperature Coefficient	20% -20% -40% -60% -80% -55°C -25°C 0°C 25°C 50°C 75°C 100°C 125°C	20% 036 -20% -40% -80% -80% -55°C -25°C 0°C 25°C 50°C 75°C 100°C 125°C								
Dissipation Factor	3.0% max	WVDC > 50 VDC, DF = 2.5% max WVDC = 25 VDC, DF = 3.0% max WVDC = 16 VDC, DF = 3.5% max								
Aging	None	2.5% / decade hour								
Insulation Resistance	1000ΩF or 100GΩ Whichever is less @ 25°C, WVDC	500ΩF or 50GΩ Whichever is less @ 25°C, WVDC								
Dielectric Strength	For Vrated = 6 - 200 VDC, DWV = 2.5 X WVDC, 25°C, 5 For Vrated = 201 - 499 VDC, DWV = 2.0 X WVDC, 25°C For Vrated = 500 - 999 VDC, DWV = 1.5 X WVDC, 25°C For Vrated = 1000 + VDC, DWV = 1.2 X WVDC, 25°C, 5	C, 50mA max. C, 50mA max.								
Test Parameters	$C \le 100 \text{ pF 1MHz} \pm 50 \text{KHz}; 1.0 \pm 0.2 \text{ VRMS}$ C > 100 pF 1KHz $\pm 50 \text{Hz}; 1.0 \pm 0.2 \text{ VRMS}$	1KHz ± 50Hz; 1.0 ± 0.2 VRMS								
Notes	TANCERAM IR = 100 Ω F or 10 G Ω , TANCERAM DF for < 25 VDC, DF = 10% max.	Vrated > 50 VDC = 5% max., & TANCERAM DF for Vrated								

HOW TO ORDER

SC	DP	502	W	102	J	4	GF	001	E		
Subfamily	Size	Voltage	DTC	Capacitance	Tol	Mark	Termination	Special Code	Pack		
SC = AC Safety Caps	DP = 1808 ED = 2211 DR = 1812 EF = 2220	302 = 250VAC [2500V Impulse] 502 = 250VAC [5000V Impulse	G = NP0/C0G W = X7R	1st two digits are significant; 3rd digit denotes number of zeros. 101 = 100 pF 103 = 0.01 µF 105 = 1.00 µF	J = ± 5% K = ± 10% M = ± 20%	4 = Required safety mark	GV = Ni/Sn (RoHS) GF = Polyterm Sn (RoHS)	001 = Default catalog item	B = Bulk E = 7" Reel Emb Tape U = 13" Reel Emb Tape		

Example: SCDP502W102J4GF001E Capacitors Safety Caps - SC, X1/Y2, 1808, X7R, 5000V, 1000pF, ±5%, Polyterm Sn (RoHS), 7" Reel Embossed Tape





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Ratings & Voltage

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	(MM)	ዜ	0 pF	2 pF	5 pF	8 pF	2 pF	7 pF	3 pF	7 pF	6 pF	8 pF	00 pF	20 pF	50 pF	80 pF	20 pF	70 pF	30 pF	.70 pF	60 pF	80 pF	000 pF	200 pF	500 pF	800 pF	200 pF	700 pF	300 pF	700 pF
.185 ± .015 .080 ± .010 .085 Max.	(4.70 ± .38) (2.03 ± .25) (2.16)	5	_	_	_	_	2	2	8	4	5	9	7-	_	7	-	2	2	3	4	5	9	_	_	_	_	2	2	9	4
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V2																							ιĻ	щ	ιĻ	Ψ	ιĻ	ιĻ	ų.	щ
Inches	(MM)	5 pF	10 pF	12 pF	15 pF	18 pF	22 pF	27 pF	33 pF	47 pF	56 pF	68 pF	100 pF	120 pF	150 pF	180 pF	220 pF	270 pF	330 pF	470 pF	560 pF	680 pF	1000 р	1200 p	1500 р	1800 р	2200 p	2700 p	3300 р	4700 pF
.175 ± .010	(4.45 ± .25)																													
.115 Max. .025 ± .015	(2.92) (0.64 ± .38)																													
1808	1																													
X1 / Y	2												ዜ Έ	Щ.	щ.	Щ.	Щ.	۳.	۳.	Щ.	۳.	Щ.	씸	씸	씸	占	씸	씸	占	씸
Inches	(MM)	5 pF	10 pF	12 pF	15 pF	18 pF	22 pF	27 pF	33 pF	47 pF	56 pF	68 pF	100	120 p	150 p	180	220 p	270 p	330 p	470 F	260 p	680	1000	1200	1500	1800	2200	2700	3300	4700
.085 Max.	(2.16)																													
	, ,																													
		닖	P 0	2 pF	5 pF	8 PF	2 pF	7 pF	3 pF	7 pF	9 PF	8	00 pF	20 pF	50 pF	80 pF	20 pF	70 pF	30 pF	70 pF	60 pF	80 pF	000 pF	200 pF	500 pF	800 pF	200 pF	700 pF	300 pF	700 pF
		5	Ţ.	<u> </u>	-	<u>-</u>	2	2	က	4	2	9	_		_	_	7	2	က	4	2	9	_	_	_	_	7	7	ر	4
.125 ± .010 .115 Max. .025 ± .015	(3.18 ± .25) (2.92) (0.64± .38)																													
2211																														
X1 / Y	2		ዜ	ዜ	۳.	۳.	۳.	۳.	_Έ	۲.	۳.	Щ.	占	씸	占	씸	씸	씸	씸	씸	씸	씸	0 pF	0 pF	0 pF	0 pF	0 pF	0 pF	0 pF	4700 pF
Inches	(MM)	<u> </u>	10	12 p	15 p	18 μ	22 F	27 F	33.	47 F	26 p	89	100	120	150	180	220	270	330	470	260	989	100	120	150	180	220	270	330	470
		47																												
.225 ± .016 .110 ± .010	(5.72 ± .40) (2.80 ± .25)	4)																												
.110 ± .010 .115 Max.	(2.80 ± .25) (2.92) (0.51 ± .25)																													
.110 ± .010 .115 Max. .020 ± .010	(2.80 ± .25) (2.92) (0.51 ± .25)												LL.										PF	PF	PF	L d	L d	PF	ЬG	Ho
.110 ± .010 .115 Max. .020 ± .010	(2.80 ± .25) (2.92) (0.51 ± .25)	5 pF	10 pF	12 pF	15 pF	18 pF	22 pF	27 pF	33 pF	47 pF	56 pF	68 pF	100 pF	120 pF	150 pF	180 pF	220 pF	270 pF	330 pF	470 pF	560 pF	680 pF	1000 pF	1200 pF	1500 pF	1800 pF	2200 pF	2700 pF	3300 pF	4700 pF
.110 ± .010 .115 Max. .020 ± .010	(2.80 ± .25) (2.92) (0.51 ± .25)	ЬЬ			15 pF	18 pF	22 pF	27 pF	33 pF	47 pF	56 pF	68 pF	100 pF	120 pF	150 pF	180 pF	220 pF	270 pF	330 pF	470 pF	560 pF	980 pF	1000 pF	1200 pF	1500 pF	1800 pF	2200 pF	2700 pF	3300 pF	4700 pF
	X2 Inches .185 ± .015 .080 ± .010 .085 Max020 ± .010 1812 X2 Inches .175 ± .010 .125 ± .015 1808 X1 / Y Inches .185 ± .015 .080 ± .015 .085 Max020 ± .010 1812 X1 / Y Inches .175 ± .010 .115 Max020 ± .010 1812 X1 / Y Inches .175 ± .010 .125 ± .010 .125 ± .010 .125 ± .010 .125 ± .010 .115 Max025 ± .015	1808 X2 Inches (MM) .185 ± .015 (4.70 ± .38) .080 ± .010 (2.03 ± .25) .085 Max. (2.16) .020 ± .010 (0.51 ± .25) 1812 X2 Inches (MM) .175 ± .010 (4.45 ± .25) .115 Max. (2.92) .025 ± .015 (0.64 ± .38) 1808 X1 / Y2 Inches (MM) .185 ± .015 (4.70 ± .38) .080 ± .015 (2.03 ± .38) .085 Max. (2.16) .020 ± .010 (0.51 ± .25) 1812 X1 / Y2 Inches (MM) .175 ± .010 (4.45 ± .25) .125 ± .010 (3.18 ± .25) .115 Max. (2.92) .025 ± .015 (0.64 ± .38) 2211	1808 X2	1808 1808	1808	1808 1808 1808 1808 1808 1808 1808 1808 1808 1812 1812 1808	1808 X2	1808 X2	1808 X2 Inches (MM) .185 ± .015 (4.70 ± .38) .080 ± .010 (2.03 ± .25) .085 Max. (2.16) .020 ± .010 (0.51 ± .25) 1812 X2 Inches (MM) .175 ± .010 (4.45 ± .25) .115 Max. (2.92) .025 ± .015 (2.03 ± .38) .080 ± .015 (2.03 ± .38) .080 ± .015 (2.03 ± .38) .085 Max. (2.16) .020 ± .010 (0.51 ± .25) 1812 Inches (MM) .185 ± .015 (4.70 ± .38) .080 ± .015 (2.03 ± .38) .085 Max. (2.16) .020 ± .010 (0.51 ± .25) 1812 X1 / Y2 Inches (MM) .175 ± .010 (4.45 ± .25) .125 ± .010 (3.18 ± .25) .115 Max. (2.92) .025 ± .015 (0.64 ± .38) 2211 X1 / Y2 La L	1808	1808	1808 X2	1808	1808	1808 1808 1808 185 ± .015 (4.70 ± .38) .025 ± .015 (4.475 ± .25) .115 Max. .020 ± .010 (0.51 ± .25) .185 ± .015 (4.470 ± .38) .080 ± .015 (2.16) .020 ± .010 (0.51 ± .25) .115 Max. .020 ± .010 (0.51 ± .25) .115 Max. .020 ± .010 (0.51 ± .25) .115 Max. .020 ± .015 (4.470 ± .38) .080 ± .015 (2.16) .020 ± .010 (0.51 ± .25) .115 Max. .020 ± .015 .064 ± .38) .175 ± .010 .184 ± .25 .115 Max. .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184 ± .25 .184	1808 1808 1808 1808 1808 1808 1809	Name	1808 1808 1808 1808 1808 1808 1809	Time Continue Co	1808 1808	Test	1808 X2	Time Common Com	Test	Test Test	1808	Teles CMM	1808	1808 1808 1808 1809	1808 1808 1808 1809 18