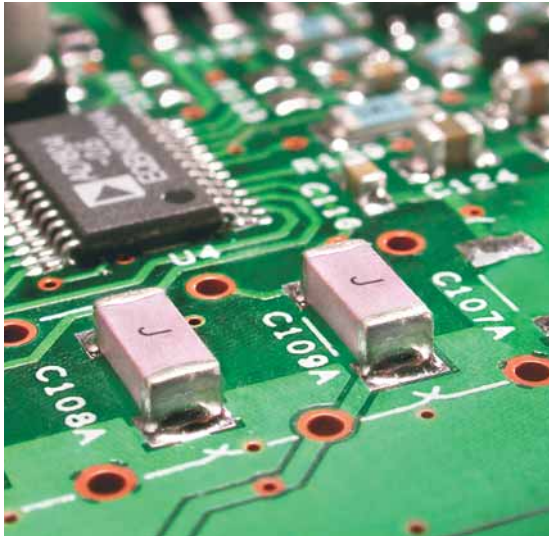


SAFETY CERTIFIED CAPACITORS

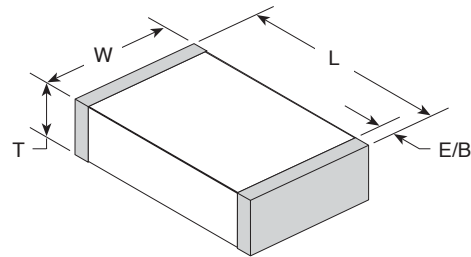


Johanson Dielectrics Type SC ceramic chip capacitors are designed for AC voltage surge and lightning protection in line-to-ground interface applications in computer network, modem, facsimile and other equipment.

Johanson'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.

Additional information on capacitor safety ratings may be found below. Specific certification details may be found under each product listing on the facing page.



SAFETY RATING	VOLTAGE RATING	WITHSTANDING VOLTAGE	IMPULSE VOLTAGE	CASE SIZE	JOHANSON ORDERING P/N
X2/Y3	250 VAC	1,500 VAC	2,500 V	1808	302R29____V_E-****-SC
Y3	250 VAC	1,500 VAC	N/A	1812	302S43____V_E-****-SC
X1/Y2	250 VAC	1,500 VAC	5,000 V	1808	502R29____V_E-****-SC
Y2	250 VAC	1,500 VAC	5,000 V	2211	502R30____V_E-****-SC
X1/Y2	250 VAC	1,500 VAC	5,000 V	2220	502S47____V3E-****-SC

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.

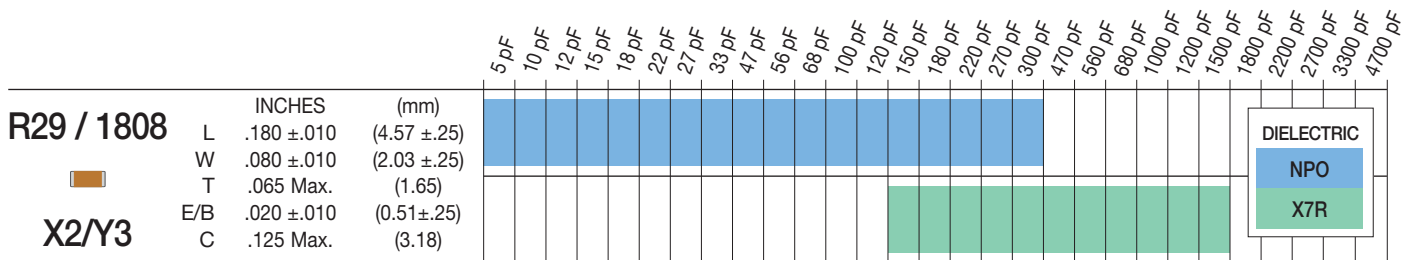
HOW TO ORDER SAFETY CERTIFIED

302	R29	N	101	K	V	3	E - ***** -	SC
IMPULSE VOLTAGE 302 = 3000V 502 = 5000V	SIZE See Size Chart	DIELECTRIC N = NPO W = X7R	CAPACITANCE 1st two digits are significant; third digit denotes number of zeros; 101 = 100 pF	TOLERANCE NPO: J = ±5% K = ±10% X7R: K = ±10% M = ±20%	TERMINATION V = Ni barrier w/ 100% Sn Plating	MARKING 3 = Special (J) 4 = No marking	TAPE MODIFIER Code Tape Reel E Embossed 7" Tape specifications conform to EIA RS481	TYPE SC = Safety Certified

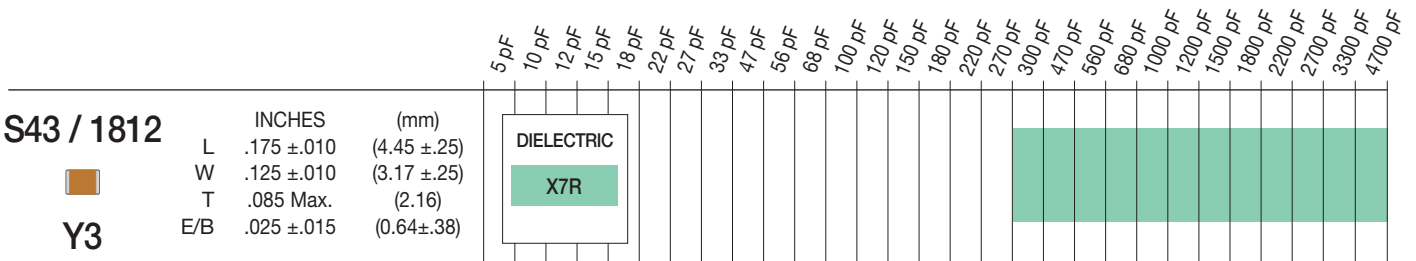
P/N written: 302R29N101KV3E-****-SC



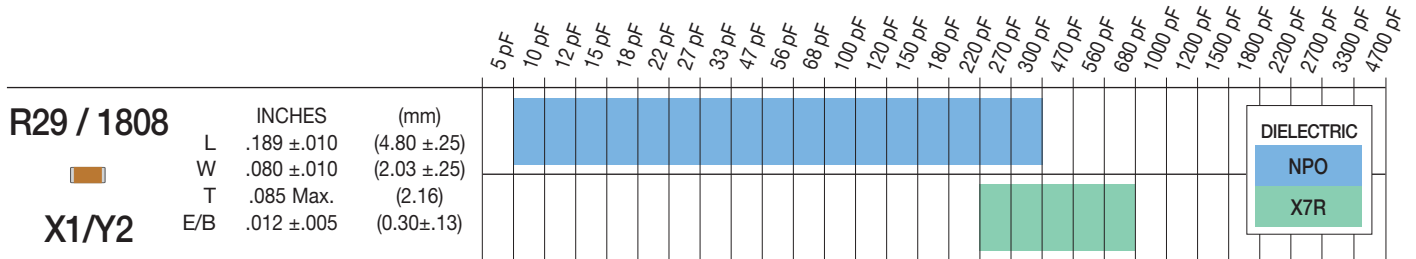
SAFETY CERTIFIED CAPACITORS



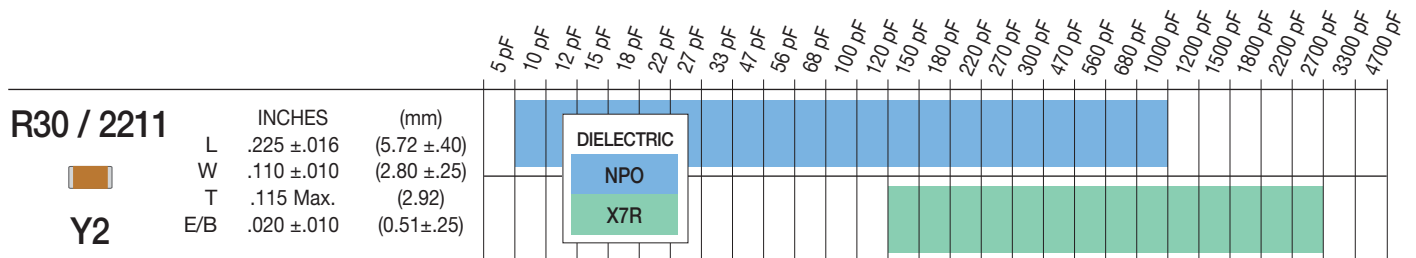
TUV Rheinland Certificate Numbers 2172792 & 2172793 Standards: EN132400:1994+A1, IEC 60384-14:1993+A1, EN 60950:1992+A1+A2+A3+A4+A11
 UL File Number E212609 Standards:UL 1950, Third Edition • Semko Reference Numbers 0026092-1 & 0003222-1 Standards: EN 132400:1994+A2:1998, IEC 60384-14, Second Edition:1993+A1:1995, Robustness of Terminations (cl 4.3) tested according to IEC 60384-1 amendment 3 cl 4.34 & 4.35, Resistance to Soldering Heat (cl 4.4) tested according to IEC 60384-1 amendment 3 cl 4.14.2, Impulse test made with 2.5KV according to clause 6.4.2.1 in IEC 60950, Creepage distance between live parts of different polarity meets the requirements in IEC 60950



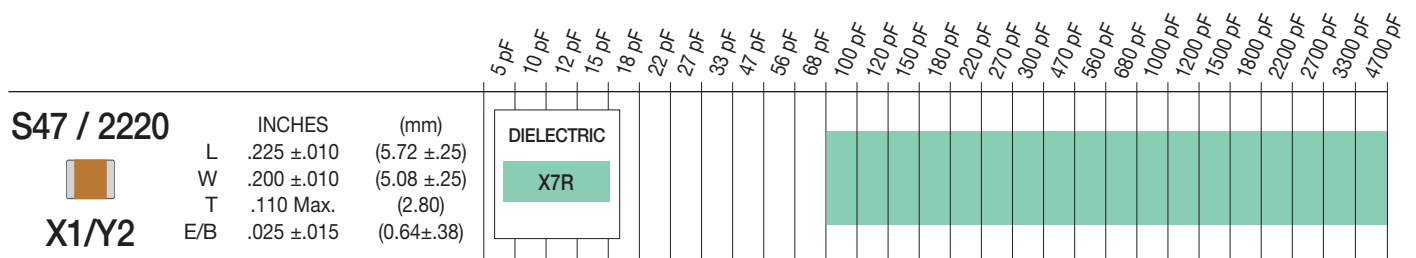
TUV Rheinland Certificate Number 2172792 Standards: EN132400:1994+A1, IEC 60384-14:1993+A1, EN 60950:1992+A1+A2+A3+A4+A11



TUV Rheinland Certificate Numbers T72041313 and T72041314 Standards: EN132400:1994+A2+A3+A4, EN60950-1:2001, IEC 384-14:1993+A1



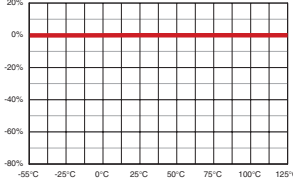
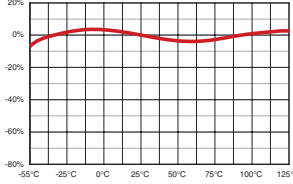
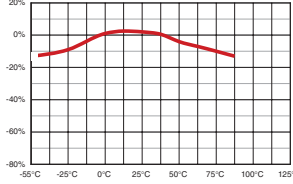
TUV Rheinland Certificate Numbers 2279224, 2172779 & 72041313 Standards: EN132400:1994+A2, IEC 60384-14:1993+A1

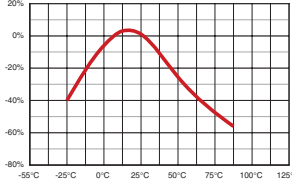
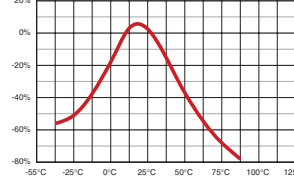


TUV Rheinland Certificate Number 2272848 Standards: IEC 60384-14:1993+A, EN 132400:1994+A2 UL File E212609 & UL60950 3rd Edition



ELECTRICAL CHARACTERISTICS

PARAMETER	NPO		X7R		X5R	
TEMPERATURE COEFFICIENT:	0± 30 ppm/°C	-55 to +125°C	± 15%	-55 to +125°C	± 15%	-55 to +85°C
						
DISSIPATION FACTOR:	.001 (0.1%) max		For Vrated = 50 VDC, DF = 2.5% max For Vrated = 125 VDC, DF = 3.0% max For Vrated = 116 VDC, DF = 3.5% max		For Vrated = 25 VDC, DF = 3.0% max For Vrated = 16 VDC: DF = 3.5% max For Vrated = 10 VDC: DF = 5.0% max	
AGING:	None		2.5% / decade hour			
INSULATION RESISTANCE:	IR @ 25°C, WVDC = 1000 F or 100G whichever is less ¹ IR @ 125°C, WVDC = 10% of 25°C rating				IR @ 25°C, WVDC = 1000 F or 100G whichever is less ²	
DIELECTRIC STRENGTH:	For Vrated = 6 - 200 VDC, DWV = 2.5 X WVDC, 25°C, 50mA max. For Vrated = 201 - 499 VDC, DWV = 2.0 X WVDC, 25°C, 50mA max. For Vrated = 500 - 999 VDC, DWV = 1.5 X WVDC, 25°C, 50mA max. For Vrated = 1000+ VDC, DWV = 1.2 X WVDC, 25°C, 50mA max.				DWV = 2.5 X WVDC, 25°C, 50mA max.	
TEST PARAMETERS:	C > 100 pF; 1kHz ±50Hz; 1.0±0.2 VRMS C 100 pF 1Mhz ±50kHz; 1.0±0.2 VRMS		1kHz ±50Hz; 1.0±0.2 VRMS		1kHz ±50Hz; 1.0±0.2 VRMS	
NOTES:			1) Tanceram X7R IR = 500 F or 10 G ,		2) Tanceram X5R IR = 500 F or 10 G	

PARAMETER	Z5U		Y5V	
TEMPERATURE COEFFICIENT:	+22% -56%	+10 to +85°C	+22% -82%	-30 to +85°C
				
DISSIPATION FACTOR:	For Vrated = 25 VDC, DF = 4.0 % max For Vrated = 16 VDC, DF = 5.0 % max		For Vrated = 25 VDC, DF = 5.0% max For Vrated = 16 VDC, DF = 7.0% max For Vrated = 10 VDC, DF = 9.0% max	
AGING:	5.0 % / decade hour		7.0% / decade hour	
INSULATION RESISTANCE:	IR @ 25°C, WVDC = 100 F or 10G whichever is less			
DIELECTRIC STRENGTH:	DWV = 2.5 X WVDC, 25°C, 50mA max.			
TEST PARAMETERS:	1kHz ±50Hz; 0.5±0.2 VRMS		1kHz ±50Hz; 1.0±0.2 VRMS	
NOTES:				