These ranges of both High Capacitance and High Voltage MLC assemblies are available in C0G and X7R dielectrics.

Low ESR and Low ESL are inherent in the design giving the assemblies a high capability up to 1MHz and offer far superior performance than either Aluminum or Tantalum electrolytic capacitors.

They are designed for use in high power or high frequency applications such as switched mode power supplies, DC-DC converters, high capacitance discharge circuits, high temperature filtering/decoupling.

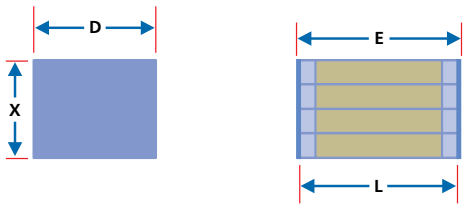
They can be made with up to five same size chips with various lead configurations to safeguard against thermal and mechanical stresses.

The commercial 'ST' series provide the highest capacitance available and are 100% tested for Dielectric Withstanding Voltage, Insulation Resistance, Capacitance, and Dissipation Factor.

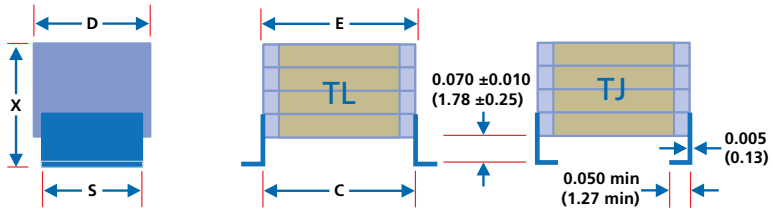
In contrast, the High Reliability 'SM' series is designed and tested for military and industrial applications and tested as per of MIL-PRF-49470 (DSCC 87106), Group A.

Dimensions - inches/mm

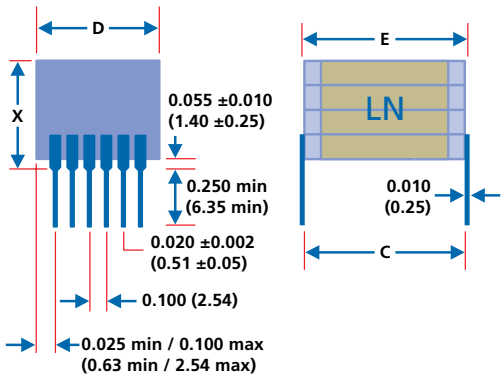
NN or NP (no leads)



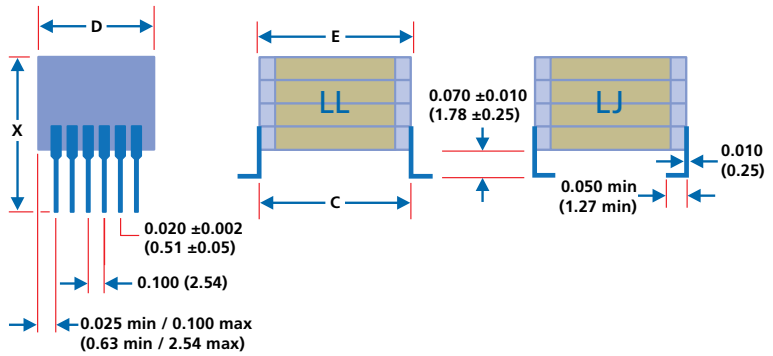
TJ & TL (tab leads)



LN (straight wire leads)



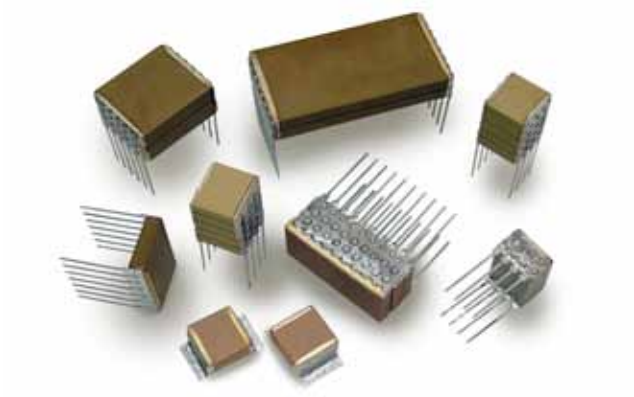
LJ & LL (bent wire leads)



Size	1812	1825	2225	3640	4540	5550	7565
C inches ±0.025/mm ±0.64:	0.210/5.33	0.210/5.33	0.250/6.35	0.400/10.20	0.480/12.20	0.580/14.70	0.780/19.80
D inches ±0.025:/mm ±0.64:	0.125/3.18	0.250/6.35	0.250/6.35	0.400/10.20	0.400/10.20	0.500/12.70	0.650*/16.50
E max inches:/mm:	0.260/6.60	0.260/6.60	0.300/7.62	0.430/10.90	0.530/13.50	0.630/16.00	0.830/21.10
L nom inches:/mm:	0.180/4.57	0.180/4.57	0.220/5.59	0.360/9.14	0.450/11.40	0.550/14.00	0.750/19.10
Leads *per side*	N/A	3	3	4	4	5	6

*±0.035/1.89

Capacitor Assemblies - ST & SM



Our complete testing facility is available for any additional military testing requirements.

Options available include thru-hole and surface mount lead styles, to make them suitable for mounting on ceramic substrates or epoxy PCBs.

Consult the Sales Office if your specific requirements exceed our catalog maximums (size, cap. value, and voltage).

Maximum stack height, X dimension - inches/mm

No. of chips	Chip size	Style NN, NP	Style TJ & TL	Style LN, LJ & LL
1	1812 1825 2225 >2225	0.100/2.54 0.100/2.54 0.120/3.05 N/A	0.180/4.57 0.180/4.57 0.200/5.08 0.200/5.08	N/A 0.180/4.57 0.200/5.08 0.200/5.08
2	1812 1825 2225 >2225	0.200/5.08 0.200/5.08 0.240/6.10 N/A	0.280/7.11 0.280/7.11 0.320/8.13 0.320/8.13	N/A 0.280/7.11 0.320/8.13 0.320/8.13
3	812 1825 2225 >2225	0.300/7.62 0.300/7.62 0.360/9.14 N/A	0.380/9.65 0.380/9.65 0.440/11.2 0.440/11.2	N/A 0.380/9.65 0.440/11.20 0.440/11.20
4	1812 1825 2225 >2225	0.400/10.20 0.400/10.20 0.480/12.20 N/A	0.480/12.2 0.480/12.2 0.560/14.2 0.560/14.2	N/A 0.480/12.20 0.560/14.20 0.560/14.20
5	1812 1825 2225 >2225	0.520/13.20 0.520/13.20 0.635/16.10 N/A	0.600/15.2 0.600/15.2 0.715/18.2 0.715/18.2	N/A 0.600/15.2 0.715/18.2 0.715/18.2

How to Order - ST & SM Capacitor Assemblies

ST	3640	B	474	M	101	LJ	X	W	5
STYLE ST = Commercial SM = High Reliability	**SIZE** See Chart	**DIELECTRIC** N = C0G B = X7R	**CAPACITANCE** Value in Picofarads. Two significant figures, followed by number of zeros: 825 = 8,200,000pF (8.2µF)	**TOLERANCE** F = ±1%* G = ±2%* H = ±3%* J = ±5% K = ±10% M = ±20% Z = +80 -20% P = +100 -0% *C0G only	**VOLTAGE-VDCW** Two significant figures, followed by number of zeros: 101 = 100V	**LEAD STYLE** LN = Straight* LL = L Lead* LJ = J Lead* TL = L Tab TJ = J tab NN = Nickel* NP = Pd/Ag *Not 1812	**THICKNESS OPTION** Specify standoff dimension if less than max.	**PACKING** W = Waffle T = Tape & Reel* *Consult the sales office	**No. Chips** 1 to 5

C0G Capacitance & Voltage Selection

Number of chips required to achieve the capacitance value

Size	1812								1825								2225								3640								Size
Rated Voltage	50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		Rated Voltage
Type	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	Type
100	1	1	1	1	1	1	1	1																									100
120	1	1	1	1	1	1	1	1																									120
150	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																	150
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																	180
220	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																	220
270	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									270
330	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									330
390	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	390
470	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	470
560	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	560
680	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	680
820	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	820
101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	101
121	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	121
151	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	151
181	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	181
221	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	221
271	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	271
331	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	331
391	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	391
471	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	471
561	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	561
681	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	681
821	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	821
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	102
122	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	122
152	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	152
182	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	182
222	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	222
272	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	272
332	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	332
392	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	392
472	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	472
562	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	562
682	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	682
822	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	822
103	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	103
123	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	123
153	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	153
183	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	183
223	1	1	1	1	1	1	3	5	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	223
273	1	1	1	1	2	2	4		1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	273
333	1	1	2	1	2	2	4		1	1	1	1	1	1	2	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	333
393	2	1	2	1	2	2	5		1	1	1	1	1	1	3	5	1	1	1	1	1	1	2	4	1	1	1	1	1	1	1	2	393
473	2	2	2	2	2	3			1	1	1	1	1	1	3		1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	2	473
563	2	2	3	3	3	3			1	1	1	1	2	2	4		1	1	1	1	1	1	3	5	1	1	1	1	1	1	2	2	563
683	3	3	3	3	3	3			1	1	2	2	2	2	4		1	1	1	1	2	2	4		1	1	1	1	1	1	2	3	683
823	3	3	3	3	4	4			2	2	2	2	2	2	5		1	1	2	2	2	2	5		1	1	1	1	1	1	2	3	823
104	3	3	4	4	5	5			2	2	2	2	2	3			2	2	2	2	2	2			1	1	1	1	1	1	3	4	104
124	4	4	5	5					2	2	2	2	3	3			2	2	2	2	2	2			1	1	1	1	1	1	3	4	124
154	5	5							3	3	3	3	3	4			2	2	3	3	3	3			1	1	1	1	2	2	4	5	154
184									3	3	3	3	4	4			2	2	3	3	3	4			1	1	1	2	2	2	4		184
224									4	4	4	4	5	5			3	3	4	4	4	4			2	2	2	2	2	3	5		224
274									4	4	5	5					4	4	4	4	5	5			2	2	2	2	3	3			274
334									5	5							4	4	5	5					2	2	2	2	3	4			334
394																	5	5							2	3	3	3	4	4			394
474																									3	3	3	3	4	5			474
564																									3	3	4	4	5				564
684																									4	4	4	4					684
824																									4	4	5	5					824
105																									5	5							105
125																																	125
155																																	155
185																																	185
225																																	225
275																																	275

Capacitance Values

Capacitor Assemblies - ST & SM - C0G

C0G Capacitance & Voltage Selection

Note: Capacitance values are shown as 3 digit code: 2 significant figures followed by the no. of zeros e.g. 183 = 18,000pF.

Number of chips required to achieve the capacitance value

Size	4540								5550								6560								7565								Size
Rated Voltage	50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		Rated Voltage
Type	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	Type
Capacitance Values																																	
100																																	100
120																																	120
150																																	150
180																																	180
220																																	220
270																																	270
330																																	330
390	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									390
470	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									470
560	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									560
680	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									680
820	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									820
101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	101
121	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	121
151	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	151
181	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	181
221	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	221
271	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	271
331	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	331
391	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	391
471	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	471
561	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	561
681	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	681
821	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	821
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	102
122	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	122
152	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	152
182	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	182
222	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	222
272	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	272
332	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	332
392	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	392
472	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	472
562	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	562
682	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	682
822	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	822
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	103
123	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	123
153	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	153
183	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	183
223	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	223
273	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	273
333	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	333
393	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	393
473	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	473
563	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	563
683	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	683
823	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	823
104	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	104
124	1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	124
154	1	1	1	1	2	2	3	5	1	1	1	1	1	2	3	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	154
184	1	1	1	1	2	2	4	5	1	1	1	1	2	2	3	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	184
224	1	1	2	2	2	2	5		1	1	1	2	2	2	3	5	1	1	1	1	1	2	2	4	1	1	1	1	1	1	2	3	224
274	2	2	2	2	2	3			1	1	2	2	2	2	4		1	1	1	1	2	2	3	4	1	1	1	1	1	1	2	3	274
334	2	2	2	2	3	3			2	2	2	2	3	3	5		1	1	2	2	2	2	3	5	1	1	1	1	1	2	3	4	334
394	2	2	2	3	3	3			2	2	2	2	3	3			1	1	2	2	2	2			1	1	1	1	2	2	3	4	394
474	2	3	3	3	4	4			2	2	3	3	3	4			2	2	2	2	3	3			1	1	2	2	2	2	4	5	474
564	3	3	3	3	4	5			2	2	3	3	4	4			2	2	2	2	3	3			1	1	2	1	2	1	4		564
684	3	4	4	4	5				3	3	3	4	4	5			2	2	3	3	3	4			2	2	2	2	2	3	5		684
824	4	4	4	5					3	3	4	4	5				2	2	3	3	4	4			2	2	2	2	3	3			824
105	4	5	5						4	4	4	5					3	3	4	4	4	5			2	2	3	3	3	4			105
125	5								4	5	5						3	3	4	4	5				2	2	3	3	4	4			125
155									5								4	4	5	5					3	3	4	4	5	5			155
185									5								5	5	5						3	3	4	4					185
225																	5								4	4	5	5					225
275																									5	5							275

X7R Capacitance & Voltage Selection

Size	1812								1825								2225								3640								Size
Vdc	50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		Vdc
Type	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	Type
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	102
122	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	122
152	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	152
182	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	182
222	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	222
272	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	272
332	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	332
392	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	392
472	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	472
562	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	562
682	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	682
822	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	822
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	103
123	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	123
153	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	153
183	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	183
223	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	223
273	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	273
333	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	333
393	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	393
473	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	473
563	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	563
683	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	683
823	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	823
104	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	104
124	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	124
154	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	154
184	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	184
224	1	1	1	1	1	1	3	4	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	224
274	1	1	1	1	1	1	3	5	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	274
334	1	1	1	1	1	1	4		1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	334
394	1	1	1	1	1	1	4		1	1	1	1	1	1	2	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	1	394
474	1	1	1	1	1	1	5		1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	1	2	474
564	1	1	1	1	2	2			1	1	1	1	1	1	3	5	1	1	1	1	1	1	2	4	1	1	1	1	1	1	2	2	564
684	1	1	2	2	2	3			1	1	1	1	1	2	4		1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	2	684
824	2	2	2	2	2	3			1	1	1	1	1	2	4		1	1	1	1	1	1	3	5	1	1	1	1	1	1	2	3	824
105	2	2	2	2	3	3			1	1	1	1	2	2	5		1	1	1	1	1	2	4		1	1	1	1	1	1	2	3	105
125	2	2	2	2	3	4			1	1	1	2	2	3			1	1	1	1	2	2	4		1	1	1	1	1	1	3	3	125
155	2	3	3	3	4	5			2	2	2	2	2	3			1	1	1	1	2	2	5		1	1	1	1	1	1	3	4	155
185	3	3	3	3	4				2	2	2	2	3	4			1	2	2	2	2	3			1	1	1	1	1	2	4	5	185
225	3	3	4	4	5				2	2	2	3	3	4			2	2	2	2	2	3			1	1	1	1	2	2	5		225
275	4	4	4	5					2	3	3	3	4	5			2	2	2	2	3	4			1	1	1	2	2	2			275
335	5	5		5					3	3	3	4	4				2	2	3	3	3	4			1	1	2	2	2	3			335
395	5								3	3	4	4	5				3	3	3	3	4	5			1	1	2	2	3	3			395
475									4	4	4	5					3	3	4	4	5				2	2	2	2	3	3			475
565									4	5	5						4	4	4	4					2	2	2	3	3	4			565
685									5								4	4	5	5					2	2	3	3	4	5			685
825																	5	5							2	2	3	4	5				825
106																									3	3	4	4					106
126																									3	3	4	5					126
156																									4	4	5						156
186																									4	5							186
226																									5								226
276																																	276
336																																	336
396																																	396
476																																	476
566																																	566
686																																	686
826																																	826
107																																	107

Number of chips required to achieve the capacitance value

Capacitance Values

Capacitor Assemblies - ST & SM - X7R

X7R Capacitance & Voltage Selection

Note: Capacitance values are shown as 3 digit code: 2 significant figures followed by the no. of zeros e.g. 183 = 18,000pF.

Size	4540								5550								6560								7565								Size
Vdc	50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		Vdc
Type	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	ST	SM	Type
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	102
122	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	122
152	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	152
182	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	182
222	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	222
272	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	272
332	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	332
392	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	392
472	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	472
562	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	562
682	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	682
822	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	822
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	103
123	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	123
153	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	153
183	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	183
223	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	223
273	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	273
333	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	333
393	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	393
473	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	473
563	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	563
683	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	683
823	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	823
104	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	104
124	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	124
154	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	154
184	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	184
224	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	224
274	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	274
334	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	334
394	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	394
474	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	474
564	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	564
684	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	684
824	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	824
105	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	105
125	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	125
155	1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	155
185	1	1	1	1	1	1	3	4	1	1	1	1	1	1	3	3	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	2	185
225	1	1	1	1	1	2	4	5	1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	3	1	1	1	1	1	1	2	3	225
275	1	1	1	1	2	2	5		1	1	1	1	1	2	4	5	1	1	1	1	1	1	3	4	1	1	1	1	1	1	3	3	275
335	1	1	1	2	2	2			1	1	1	1	2	2	5		1	1	1	1	1	1	3	4	1	1	1	1	1	1	3	4	335
395	1	1	2	2	2	3			1	1	1	2	2	2			1	1	1	1	1	1	4	5	1	1	1	1	1	1	3	4	395
475	1	1	2	2	3	3			1	1	2	2	2	2			1	1	1	1	2	2	5		1	1	1	1	1	2	4	5	475
565	2	2	2	2	3	3			1	1	2	2	2	3			1	1	1	1	2	2			1	1	1	1	2	2	5		565
685	2	2	2	3	4	4			1	1	2	2	3	3			1	1	2	2	2	2			1	1	1	2	2	2			685
825	2	2	3	3	4	5			2	2	2	3	3	4			1	1	2	2	2	3			1	1	2	2	2	2			825
106	2	3	3	4	5				2	2	3	3	4	4			1	1	2	2	3	3			1	1	2	2	2	3			106
126	3	3	4	5					2	2	3	4	4	5			1	2	2	3	3	3			1	1	2	2	3	3			126
156	3	4	5						2	3	4	4	5				2	2	3	3	4	4			2	2	2	3	3	4			156
186	4	4	5						3	3	5	5					2	2	3	4	4	5			2	2	3	3	4	4			186
226	4	5							3	4	5						2	2	4	4	5				2	2	3	4	4	5			226
276	5								4	5							3	3	5	5					2	3	4	4	5				276
									5	5							3	3	5						3	3	5	5					336
									5								4	4							3	3	5						396
																	4	5							4	4							476
																	5								4	5							566
																									5								686
																																	826
																																	107

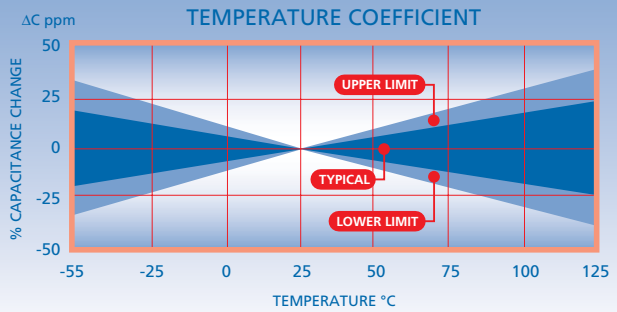
Capacitance Values

Number of chips required to achieve the capacitance value

Dielectric Characteristics

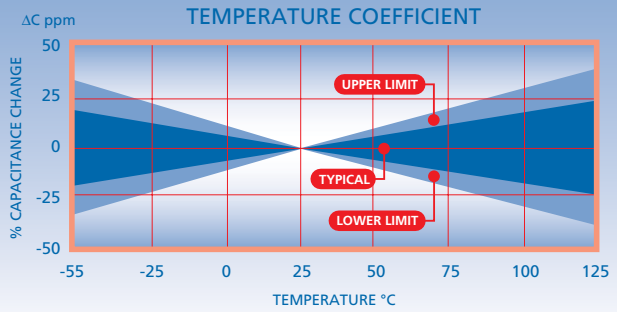
C0G/NP0 (N) Ultra Stable and RoHS 2013 (RN) type

Operating temperature range:		-55°C to 125°C
Temperature coefficient:		0 ±30 ppm/°C
Dissipation factor:		0.1% max @ 25°C
Insulation resistance	@25°C: @125°C:	>100GΩ or >1000ΩF whichever is less >10GΩ or >100ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for Capacitance ≤100pF



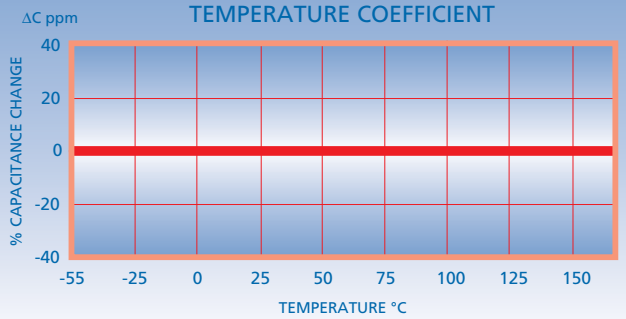
C0G/NP0 (M) Ultra Stable Non Magnetic

Operating temperature range:		-55°C to 125°C
Temperature coefficient:		0 ±30 ppm/°C
Dissipation factor:		0.1% max @ 25°C
Insulation resistance	@25°C: @125°C:	>1000ΩF or >10000ΩF whichever is less >100ΩF or >1000ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for Capacitance ≤100pF



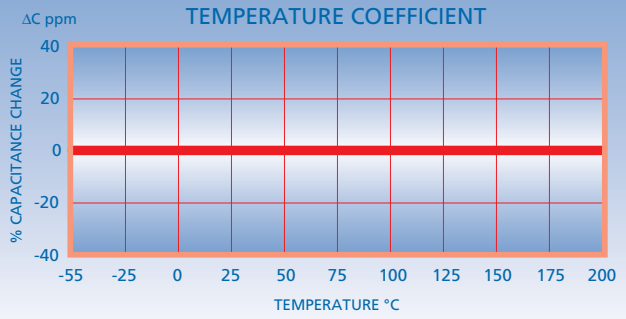
C0G/NP0 (F) Ultra Stable High Temperature (up to 160°C)

Operating temperature range:		-55°C to 160°C
Temperature coefficient:		0 ±30 ppm/°C
Dissipation factor:		0.1% max @ 25°C
Insulation resistance	@25°C: @160°C:	>100GΩ or >1000ΩF whichever is less >1GΩ or >10ΩF whichever is less
Dielectric withstanding voltage	<200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for Capacitance ≤100pF



C0G/NP0 (D) Ultra Stable High Temperature (up to 200°C)

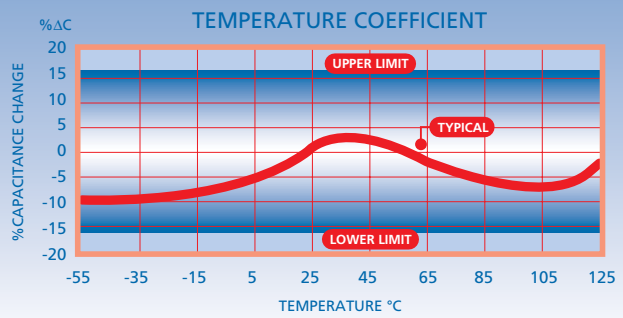
Operating temperature range:		-55°C to 200°C
Temp. coefficient ≤200°C:		0 ±30 ppm/°C
Dissipation factor @ 25°C:		0.1% Max.
Insulation resistance	@25°C: @200°C:	>100GΩ or >1000ΩF whichever is less >1GΩ or >10ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C 1MHz for capacitance ≤100pF



Dielectric Characteristics

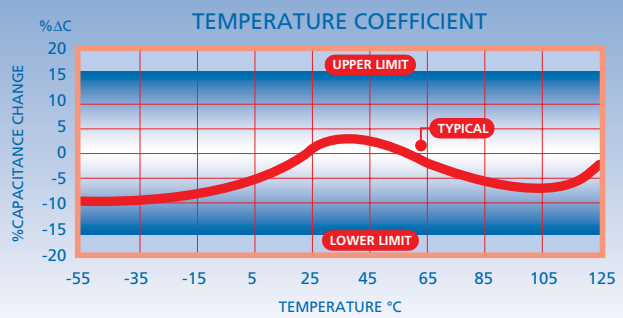
X7R (B) Stable and RoHS 2013 (RB) type

Operating temperature range:		-55°C to 125°C
Temperature coefficient :		±15% ΔC Max.
Dissipation factor	>25V rating: ≤25V rating:	2.5% max 3.5% max
Insulation resistance:	@25°C: @125°C:	>100GΩ or >1000ΩF whichever is less >10GΩ or >100ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		<2.0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C



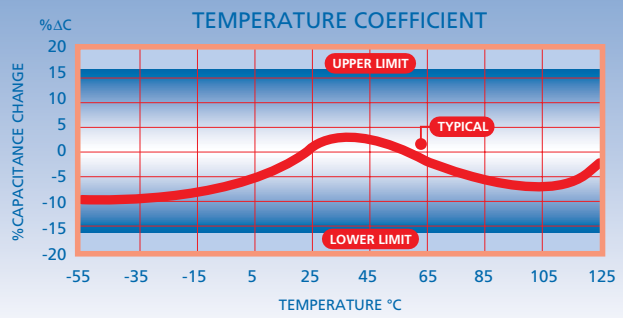
X7R (C) Stable Non Magnetic

Operating temperature range:		-55°C to 125°C
Temperature coefficient:		±15% ΔC Max.
Dissipation factor	>25V rating: ≤25V rating:	2.5% max 3.5% max
Insulation resistance:	@25°C: @125°C:	>100GΩ or >1000ΩF whichever is less >10GΩ or >100ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		<2.0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C



BX (X) Stable

Operating temperature range:		-55°C to 125°C
Temperature coefficient: Temp-voltage coefficient:		±15% ΔC Max. +15% -25% ΔC Max.
Dissipation factor	>25V rating: ≤25V rating:	2.5% max 3.5% max
Insulation resistance:	@25°C: @125°C:	>100GΩ or >1000ΩF whichever is less >10GΩ or >100ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		<2.0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C



X8R (S) Stable

Operating temperature range:		-55°C to 150°C
Temp. coefficient ≤150°C:		±15% ΔC Max.
Dissipation factor	>25V rating: ≤25V rating:	2.5% max 3.5% max
Insulation resistance	@25°C: @150°C:	>100GΩ or >1000ΩF whichever is less >10GΩ or >100ΩF whichever is less
Dielectric withstanding voltage	≤200V: 201-500V: >500V:	250% 150% or 500V whichever is greater 120% or 750V whichever is greater
Ageing rate:		<2.0% per decade
Test parameters:		1KHz, 1.0 ±0.2 VRMS, 25°C