

Capacitor Assemblies - ST & SM

These ranges of both High Capacitance and High Voltage MLC assemblies are available in COG 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.

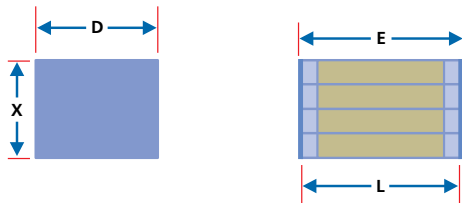
They can be made with up to five same size chips with various lead configurations to safeguard against thermal and mechanical stresses.

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

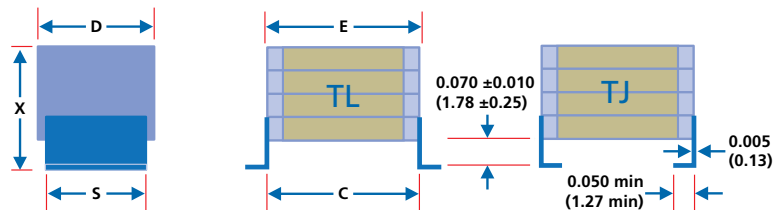
In contrast, the High Reliability 'SM' series is designed and tested for military and industrial applications and tested as per of MIL-PRF-49470 (DSCC 87106), Group A.

Dimensions - inches/mm

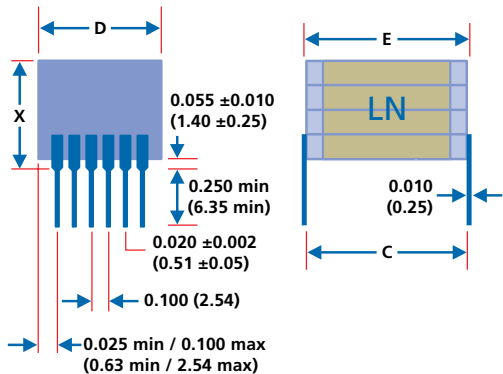
NN or NP (no leads)



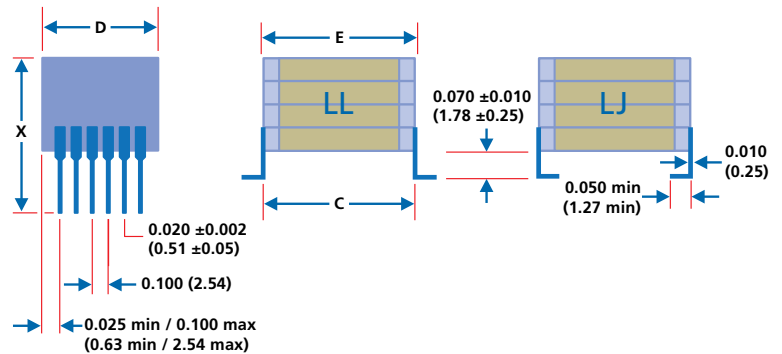
TJ & TL (tab leads)



LN (straight wire leads)



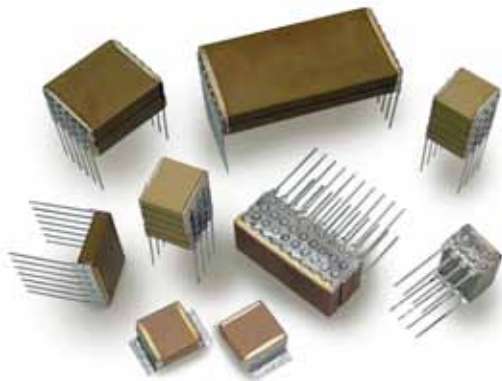
LJ & LL (bent wire leads)



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	0.100/2.54	0.180/4.57	N/A
	1825	0.100/2.54	0.180/4.57	0.180/4.57
	2225	0.120/3.05	0.200/5.08	0.200/5.08
	>2225	N/A	0.200/5.08	0.200/5.08
2	1812	0.200/5.08	0.280/7.11	N/A
	1825	0.200/5.08	0.280/7.11	0.280/7.11
	2225	0.240/6.10	0.320/8.13	0.320/8.13
	>2225	N/A	0.320/8.13	0.320/8.13
3	812	0.300/7.62	0.380/9.65	N/A
	1825	0.300/7.62	0.380/9.65	0.380/9.65
	2225	0.360/9.14	0.440/11.2	0.440/11.20
	>2225	N/A	0.440/11.2	0.440/11.20
4	1812	0.400/10.20	0.480/12.2	N/A
	1825	0.400/10.20	0.480/12.2	0.480/12.20
	2225	0.480/12.20	0.560/14.2	0.560/14.20
	>2225	N/A	0.560/14.2	0.560/14.20
5	1812	0.520/13.20	0.600/15.2	N/A
	1825	0.520/13.20	0.600/15.2	0.600/15.2
	2225	0.635/16.10	0.715/18.2	0.715/18.2
	>2225	N/A	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 = COG 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% *COG 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*	No. Chips 1 to 5
								*Consult the sales office	

Capacitor Assemblies - ST & SM - COG

COG Capacitance & Voltage Selection

Size	1812								1825								2225								3640								Size
	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	Type								
100	1	1	1	1	1	1	1	1																									
120	1	1	1	1	1	1	1	1																									
150	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									
220	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	822								
103	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	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	2	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	2	1	1	1	1	1	1	1	1	1	153								
183	1	1	1	1	1	1	1	4	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	183								
223	1	1	1	1	1	1	1	3	5	1	1	1	1	1	2	3	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	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	1	1	333								
393	2	1	2	1	2	2	5		1	1	1	1	1	1	3	5	1	1	1	1	1	1	1	1	393								
473	2	2	2	2	2	3			1	1	1	1	1	1	3	4	1	1	1	1	1	1	1	2	473								
563	2	2	3	3	3	3			1	1	1	1	1	1	3	5	1	1	1	1	1	1	1	2	563								
683	3	3	3	3	3	3			1	1	2	2	2	2	4		1	1	1	1	1	1	1	2	683								
823	3	3	3	3	4	4			2	2	2	2	2	5		1	1	1	1	1	1	1	2	3	823								
104	3	3	4	4	5	5			2	2	2	2	2	3		1	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				124								
154	5	5							3	3	3	3	3	4		2	2	3	3	3	3				154								
184									3	3	3	3	4	4		2	2	3	3	3	4				184								
224									4	4	4	4	5	5		3	3	4	4	4	4				224								
274									4	4	5	5				4	4	4	4	5	5				274								
334									5	5						4	4	5	5						334								
394																5	5								394								
474																									474								
564																									564								
684																									684								
824																									824								
105																									105								
125																									125								
155																									155								
185																									185								
225																									225								
275																									275								

Number of chips required to achieve the capacitance value

Capacitance Values

Capacitor Assemblies - ST & SM - X7R

X7R Capacitance & Voltage Selection

Size	1812								1825								2225								3640								Size
	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	184				
224	1	1	1	1	1	1	3	4	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	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	2	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	2	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	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	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	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	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	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	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	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	155				
185	3	3	3	3	4				2	2	2	2	3	4			1	2	2	2	2	3			1	1	1	1	185				
225	3	3	4	4	5				2	2	2	3	3	4			2	2	2	2	2	3			1	1	1	1	225				
275	4	4	4	5					2	3	3	3	4	5			2	2	2	2	3	4			1	1	1	2	275				
335	5	5		5					3	3	3	4	4				2	2	3	3	3	4			1	1	2	2	335				
395	5								3	3	4	4	5				3	3	3	3	4	5			1	1	2	2	395				
475									4	4	4	5					3	3	4	4	5				2	2	2	2	475				
565									4	5	5						4	4	4	4					2	2	2	3	565				
685									5								4	4	5	5					2	2	3	3	685				
825																	5	5							2	2	3	4	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																																	
396																																	
476																																	
566																																	
686																																	
826																																	
107																																	

Number of chips required to achieve the capacitance value

Capacitance Values

Capacitor Assemblies - ST & SM - X7R



X7R Capacitance & Voltage Selection

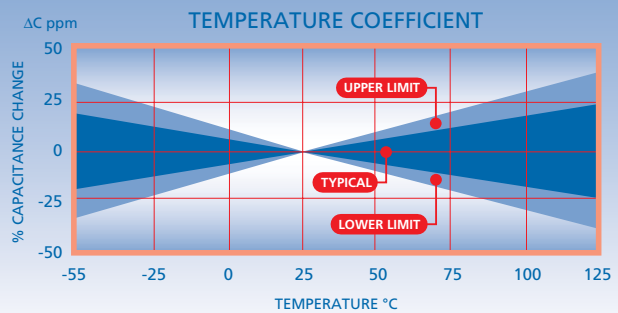
Note: Capacitance values are shown as 3 digit code: 2 significant figures followed by the no. of zeros e.g. 183 = 18,000pF.

Size	4540								5550								6560								7565								Size
	50V		100V		200V		500V		50V		100V		200V		500V		50V		100V		200V		500V		Vdc								
	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	474								
564	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	564								
684	1	1	1	1	1	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	684								
824	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	824								
105	1	1	1	1	1	2	3	1	1	1	1	2	2	1	1	1	1	1	2	1	1	1	1	1	105								
125	1	1	1	1	1	2	3	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	2	125							
155	1	1	1	1	1	3	4	1	1	1	1	2	3	1	1	1	1	2	2	1	1	1	1	2	2	155							
185	1	1	1	1	1	3	4	1	1	1	1	3	3	1	1	1	1	2	3	1	1	1	1	2	2	185							
225	1	1	1	1	1	4	5	1	1	1	1	3	4	1	1	1	1	2	3	1	1	1	1	2	3	225							
275	1	1	1	1	2	2	5	1	1	1	1	2	4	5	1	1	1	1	3	4	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	3	4	1	1	1	1	3	4	335						
395	1	1	2	2	2	3		1	1	1	2	2	2		1	1	1	1	4	5	1	1	1	1	3	4	395						
475	1	1	2	2	3	3		1	1	2	2	2	2		1	1	1	2	2	5	1	1	1	1	2	4	5	475					
565	2	2	2	2	3	3		1	1	2	2	2	3		1	1	1	2	2		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		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		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				
Capacitance Values								5	5						3	3	5					3	3	5	5			336					
								5							4	4							3	3	5				396				
								5							4	5							4	4					476				
								5							5								4	5					566				
								5															5						686				
																													826				
																													107				

Number of chips required to achieve the capacitance value

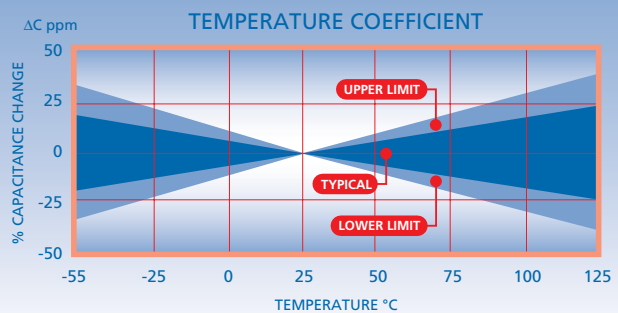
COG/NP0 (N) Ultra Stable and RoHS 2013 (RN) type

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: >100GΩ or >1000ΩF whichever is less @125°C: >10GΩ or >100ΩF whichever is less
Dielectric withstanding voltage	≤200V: 250% 201-500V: 150% or 500V whichever is greater >500V: 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



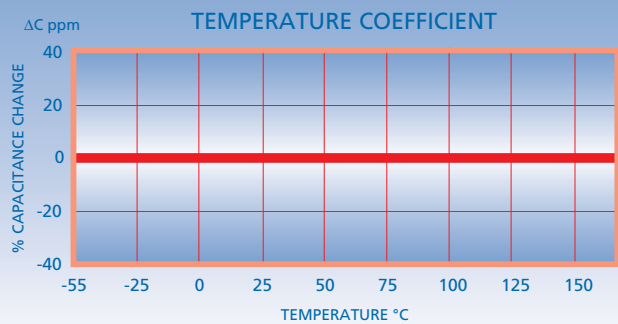
COG/NP0 (M) Ultra Stable Non Magnetic

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: >1000ΩF or >10000ΩF whichever is less @125°C: >100ΩF or >1000ΩF whichever is less
Dielectric withstanding voltage	≤200V: 250% 201-500V: 150% or 500V whichever is greater >500V: 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



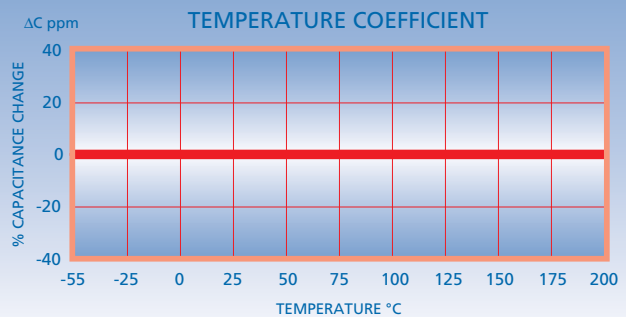
COG/NP0 (F) Ultra Stable High Temperature (up to 160°C)

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: >100GΩ or >1000ΩF whichever is less @160°C: >1GΩ or >10ΩF whichever is less
Dielectric withstanding voltage	<200V: 250% 201-500V: 150% or 500V whichever is greater >500V: 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



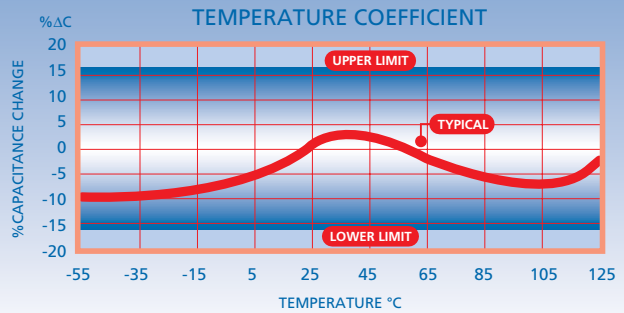
COG/NP0 (D) Ultra Stable High Temperature (up to 200°C)

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: >100GΩ or >1000ΩF whichever is less @200°C: >1GΩ or >10ΩF whichever is less
Dielectric withstanding voltage	≤200V: 250% 201-500V: 150% or 500V whichever is greater >500V: 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



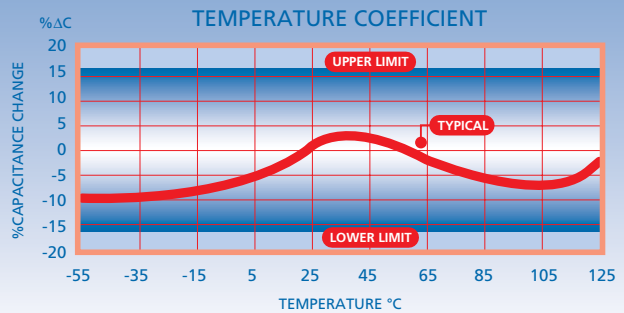
X7R (B) Stable and RoHS 2013 (RB) type

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



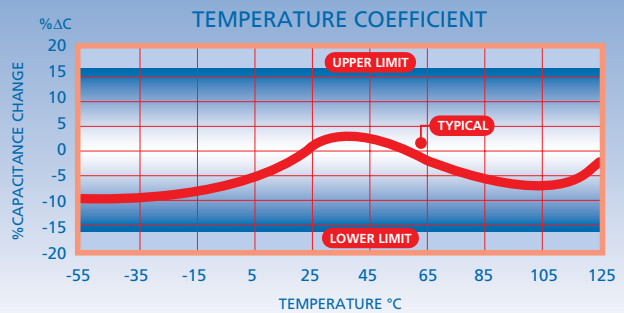
X7R (C) Stable Non Magnetic

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

