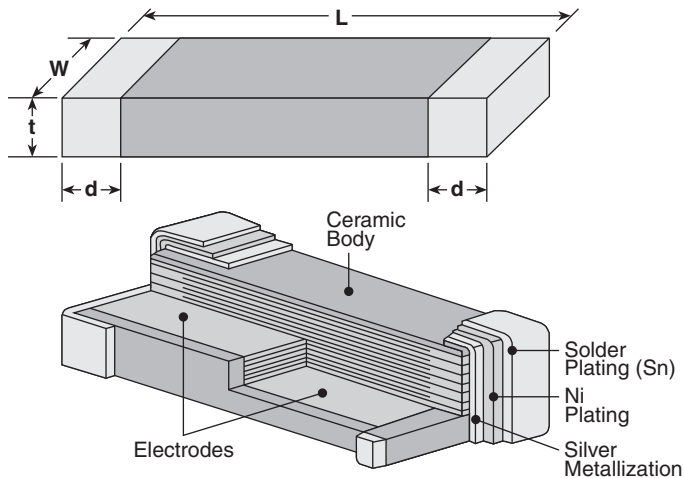


features

- High Q factor
- Low T.C.C.
- Available in high capacitance values (up to 100 μ F)
- Products with lead-free terminations meet EU RoHS requirements

dimensions and construction



Case Size	Dimensions inches (mm)			
	L	W	t (Max.)	d
0402	.039 \pm .004 (1.0 \pm 0.1)	.02 \pm .004 (0.5 \pm 0.1)	.021 (0.55)	.01 \pm .006 (0.25 \pm 0.15)
0603	.063 \pm .006 (1.6 \pm 0.15)	.032 \pm .006 (0.81 \pm 0.15)	.035 (0.9)	.014 \pm .006 (0.35 \pm 0.15)
0805	.079 \pm .008 (2.01 \pm 0.2)	.049 \pm .008 (1.25 \pm 0.2)	.051 (1.3)	.02 \pm .01 (0.50 \pm 0.25)
1206	.126 \pm .008 (3.2 \pm 0.2)	.063 \pm .008 (1.6 \pm 0.2)	.059 (1.5)	.02 \pm .01 (0.5 \pm 0.25)
1210	.126 \pm .008 (3.2 \pm 0.2)	.098 \pm .008 (2.5 \pm 0.2)	.067 (1.7)	.02 \pm .01 (0.5 \pm 0.25)

ordering information

New Part #	NPO	0805	H	T	TD	101	K
	Dielectric	Size	Voltage	Termination Material	Packaging	Capacitance	Tolerance
	NPO X5R X7R Y5V	0402 0603 0805 1206 1210	A = 10V C = 16V E = 25V H = 50V I = 100V J = 200V K = 6.3V	T: Sn	TP: 7" 2mm pitch (0402 only) TD: 7" paper tape TE: 7" embossed plastic TDB: 13" paper tape TEB: 13" embossed plastic	NPO, X5R, X7R, Y5V: 2 significant digits + no. of zeros. "R" indicates decimal point	B: \pm 0.1pF C: \pm 0.25pF D: \pm 0.5pF F: \pm 1% G: \pm 2% J: \pm 5% K: \pm 10% M: \pm 20% Z: +80, -20%

For further information on packaging, please refer to Appendix B.

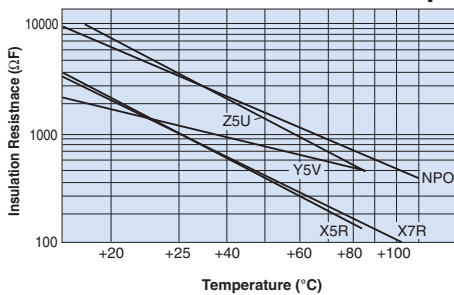
applications and ratings

Dielectric	Capacitance Range	Capacitance Tolerance*	Voltage Ratings	Dissipation Factor	T.C.C.	Test Voltage	Operating Temperature	Insulation Resistance
NPO	0.47pF - 0.010μF	.47pF~8.2pF= C:±0.25pF 5.6pF~8.2pF= D±0.5pF 10pF~ 10000pF= F:±1%, G:±2%,J:±5%	16V 25V 50V 100V 200V	For Values >30pF: 0.1% max., ≤30pF: Q = 400 + 20 x C DF = 1/Q C is in pF	0 ± 30 ppm/°C	1.0 ± 0.2 Vrms	-55°C to +125°C	+25°C 100,000MΩ min. or 1000 MΩ - μF min. whichever is less
X5R	0.068μF - 22μF	K: ±10%	6.3V 10V	6.3V = 7.5% max. 10V = 10% max.	±15% (0 VDC)	1.0 ± 0.2 Vrms	-55°C to +85°C	+25°C 100,000MΩ min. or 500 MΩ - μF min. whichever is less
X7R	100pF - 4.7μF	K: ±10%	10V 16V 25V 50V 100V 200V	10V = 10% max. 16V = 3.5% max. 25V, 50V, 100V = 2.5% max.	±15% (0 VDC)	1.0 ± 0.2 Vrms	-55°C to +125°C	+25°C 100,000MΩ min. or 1000 MΩ - μF min. whichever is less
Y5V	10000pF - 22μF	Z: +80, -20%	10V 16V 25V 50V	16V & 25V = 7.0% 50V = 5.0%	+22% to -82% max.	1.0 ± 0.2 Vrms	-30°C to +85°C	+25°C 10,000MΩ min. or 1000 MΩ - μF min. whichever is less

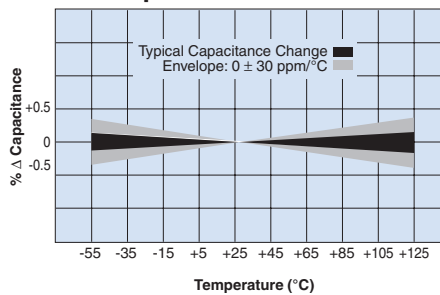
* Special tolerances available, please consult factory.

environmental applications

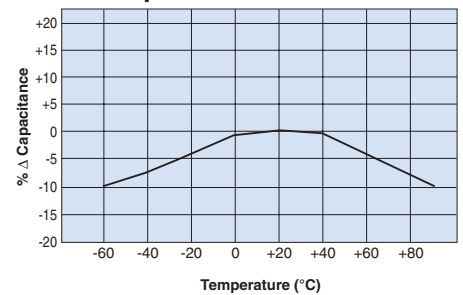
Insulation Resistance vs Temp.



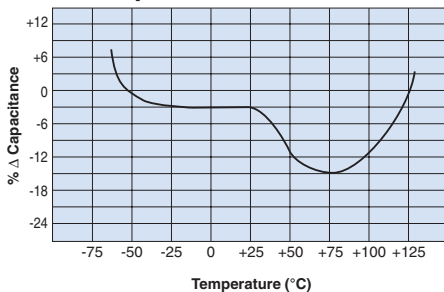
NPO - Temperature Coefficient



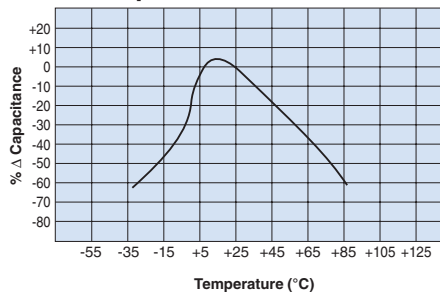
X5R - Temperature Coefficient



X7R - Temperature Coefficient



Y5V - Temperature Coefficient



NPO capacitance voltage availability

Size				0402*			0603*		0805			1206			1210	
pF	Capacitance values		WVDC	16 (C)	25 (E)	50 (H)	50 (H)	100 (I)	50 (H)	100 (I)	200 (J)	50 (H)	100 (I)	200 (J)	50 (H)	200 (J)
	µF	Cap. Code														
0.47		R47														
0.56		R56														
0.68		R68														
0.82		R82														
1		1R0														
1.2		1R2														
1.5		1R5														
1.8		1R8														
2.2		2R2														
2.7		2R7														
3.3		3R3														
3.9		3R9														
4.7		4R7														
5.6		5R6														
6.8		6R8														
8.2		8R2														
10		100														
12		120														
15		150														
18		180														
22		220														
27		270														
33		330														
39		390														
47		470														
56		560														
68		680														
82		820														
100	.0001	101														
120	.00012	121														
150	.00015	151														
180	.00018	181														
220	.00022	221														
270	.00027	271														
330	.00033	331														
390	.00039	391														
470	.00047	471														
560	.00056	561														
680	.00068	681														
820	.00082	821														
1000	.0010	102														
1200	.0012	122														
1500	.0015	152														
1800	.0018	182														
2200	.0022	222														
2700	.0027	272														
3300	.0033	332														
3900	.0039	392														
4700	.0047	472														
5600	.0056	562														
6800	.0068	682														
8200	.0082	822														
10000	.010	103														
12000	.012	123														
15000	.015	153														
18000	.018	183														
22000	.022	223														
27000	.027	273														
33000	.033	333														
39000	.039	393														

Capacitance tolerance available:

.47pF~8.2pF = C: ±0.25pF

5.6pF~8.2pF = D: ±0.5pF

10pF~10000pF = F: ±1%, G: ±2%, J: ±5%

X5R capacitance voltage availability

Size	0402			0603				0805				1206				1210	
	6.3 (K)	10 (A)	16 (C)	6.3 (K)	10 (A)	16 (C)	25 (E)	6.3 (K)	10 (A)	16 (C)	25 (E)	6.3 (K)	10 (A)	16 (C)	25 (E)	6.3 (K)	10 (A)
100																	
150																	
220																	
330																	
470																	
680																	
1000																	
1200																	
1500																	
1800																	
2200																	
2700																	
3300																	
3900																	
4700																	
5600																	
6800																	
8200																	
0.010																	
0.012																	
0.015																	
0.018																	
0.022																	
0.027																	
0.033																	
0.039																	
0.047																	
0.056		■															
0.068		■															
0.082		■															
0.10		■															
0.12		■															
0.15		■															
0.18																	
0.22																	
0.27																	
0.33					■												
0.47					■												
0.56					■												
0.68																	
0.82																	
1.0				■	■												
1.2																	
1.5																	
1.8																	
2.2								■	■								
3.3								■	■								
4.7								■	■			■	■				
6.8												■	■				
10												■	■			■	
22												■	■				
47																	
100																	

Capacitance tolerance available: ±10%

X7R capacitance voltage availability

Size	Capacitance values			0402				0603				0805				1206				1210							
	pF	μF	Cap. Code	10 (A)	16 (C)	25 (E)	50 (H)	10 (A)	16 (C)	25 (E)	50 (H)	10 (A)	16 (C)	25 (E)	50 (H)	100 (I)	200 (J)	10 (A)	16 (C)	25 (E)	50 (H)	100 (I)	200 (J)	50 (H)	100 (I)	200 (J)	
100	.0001	101																									
120	.00012	121																									
150	.00015	151																									
180	.00018	181																									
220	.00022	221																									
270	.00027	271																									
330	.00033	331																									
390	.00039	391																									
470	.00047	471																									
560	.00056	561																									
680	.00068	681																									
820	.00082	821																									
1000	.0010	102																									
1200	.0012	122																									
1500	.0015	152																									
1800	.0018	182																									
2200	.0022	222																									
2700	.0027	272																									
3300	.0033	332																									
3900	.0039	392																									
4700	.0047	472																									
5600	.0056	562																									
6800	.0068	682																									
8200	.0082	822																									
10000	.010	103																									
12000	.012	123																									
15000	.015	153																									
18000	.018	183																									
22000	.022	223																									
27000	.027	273																									
33000	.033	333																									
39000	.039	393																									
47000	.047	473																									
56000	.056	563																									
68000	.068	683																									
82000	.082	823																									
100000	.100	104																									
120000	.120	124																									
150000	.150	154																									
180000	.180	184																									
220000	.220	224																									
270000	.270	274																									
330000	.330	334																									
390000	.390	394																									
470000	.470	474																									
560000	.560	564																									
680000	.680	684																									
1000000	1.00	105																									
1200000	1.20	125																									
1500000	1.50	155																									
1800000	1.80	185																									
2200000	2.20	225																									
3900000	3.90	395																									
4700000	4.70	475																									

Capacitance tolerance available: ±10%

capacitors

Y5V capacitance voltage availability

Size			0402		0603				0805				1206			
Capacitance values pF	μF	Cap. Code	10	16	10	16	25	50	10	16	25	50	10	16	25	50
			(A)	(C)	(A)	(C)	(E)	(H)	(A)	(C)	(E)	(H)	(A)	(C)	(E)	(H)
2200	.0022	222														
2700	.0027	272														
3300	.0033	332														
3900	.0039	392														
4700	.0047	472														
5600	.0056	562														
6800	.0068	682														
8200	.0082	822														
10000	.010	103														
12000	.012	123														
15000	.015	153														
18000	.018	183														
22000	.022	223														
27000	.027	273														
33000	.033	333														
39000	.039	393														
47000	.047	473														
56000	.056	563														
68000	.068	683														
82000	.082	823														
100000	.100	104														
120000	.120	124														
150000	.150	154														
180000	.180	184														
220000	.220	224														
270000	.270	274														
330000	.330	334														
390000	.390	394														
470000	.470	474														
560000	.560	564														
680000	.680	684														
820000	.820	824														
1000000	1.0	105														
1200000	1.2	125														
1500000	1.5	155														
1800000	1.8	185														
2200000	2.2	225														
2700000	2.7	275														
3300000	3.3	335														
3900000	3.9	395														
4700000	4.7	475														
5600000	5.6	565														
6800000	6.8	685														
10000000	10	106														
22000000	22	226														

Capacitance tolerance available: +80, -20%

capacitors