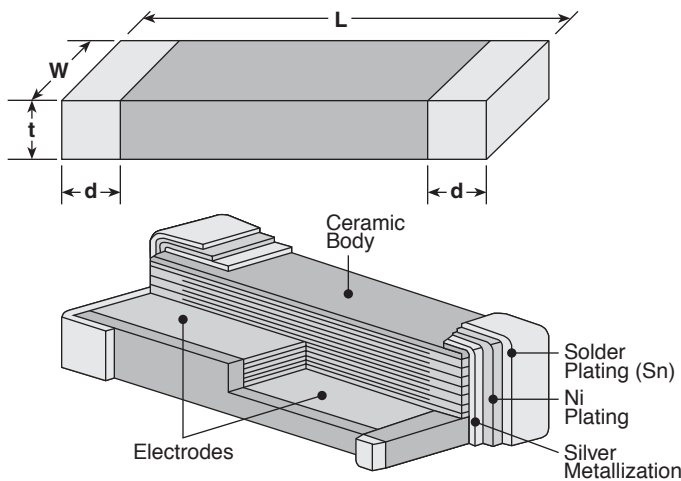




### features

- High Q factor
- Low T.C.C.
- Available in high capacitance values (up to 100  $\mu$ F)
- Products with lead-free terminations meet Eu RoHS requirements and China 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
	<b>Dielectric</b>	<b>Size</b>	<b>Voltage</b>	<b>Termination Material</b>	<b>Packaging</b>	<b>Capacitance</b>	<b>Tolerance</b>
	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.

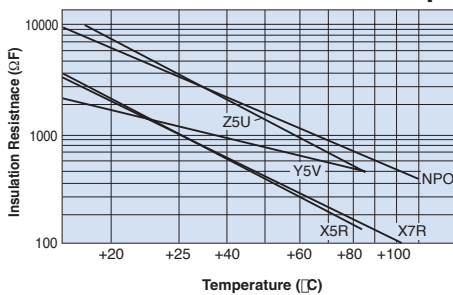
### applications and ratings

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

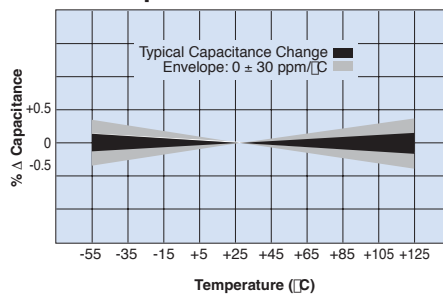
\* Special tolerances available, please consult factory.

### environmental applications

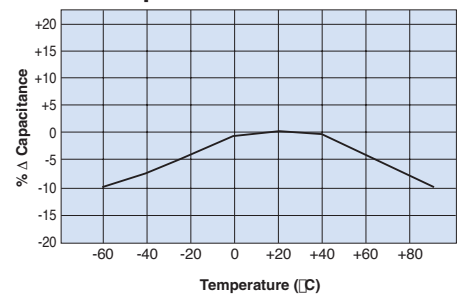
#### Insulation Resistance vs Temp.



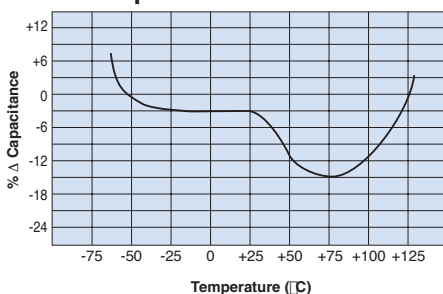
#### NPO - Temperature Coefficient



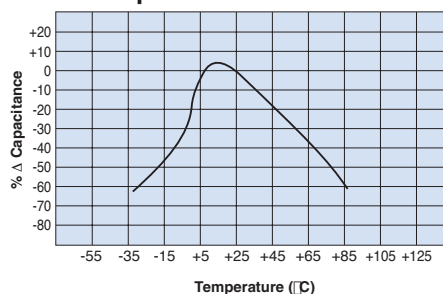
#### X5R - Temperature Coefficient



#### X7R - Temperature Coefficient



#### Y5V - Temperature Coefficient



Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

8/17/07

## NPO capacitance voltage availability

Size				0402*			0603*			0805			1206			1210	
Capacitance values pF	Cap. Code	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)	
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																

\* IR and vapor phase solder only recommended

Capacitance tolerance available:

.47pF~8.2pF = C: ±0.25pF

5.6pF~8.2pF = D: ±0.5pF

10pF~10000pF = F: ±1%, G: ±2%, J: ±5%

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

1/30/08

## 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%

capacitors

## X7R capacitance voltage availability

Size			0402*				0603*				0805				1206					1210						
Capacitance values pF	μF	Cap. Code	10	16	25	50	10	16	25	50	10	16	25	50	100	200	10	16	25	50	100	200	50	100	200	
			(A)	(C)	(E)	(H)	(A)	(C)	(E)	(H)	(A)	(C)	(E)	(H)	(I)	(J)	(A)	(C)	(E)	(H)	(I)	(J)	(H)	(I)	(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																								

\* IR and vapor phase solder only recommended

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														

\* IR and vapor phase solder only recommended

Capacitance tolerance available: +80, -20%

capacitors