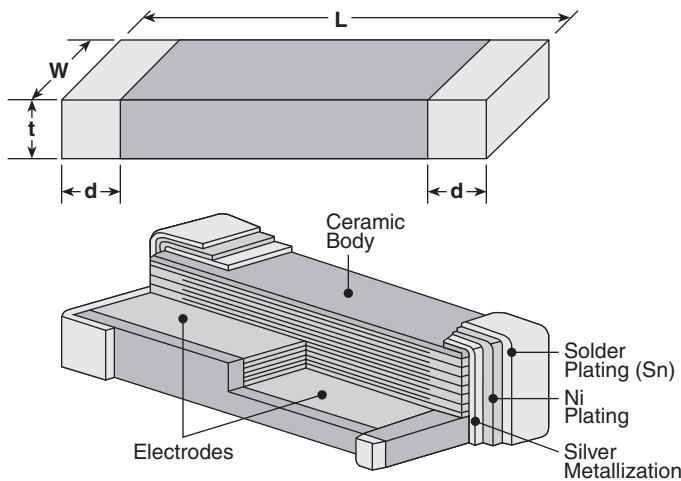


features

- High Q factor
- Low T.C.C.
- Available in high capacitance values (up to 100 μ F)

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 Z5U	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 Z5U: 2 significant digits + no. of zeros	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

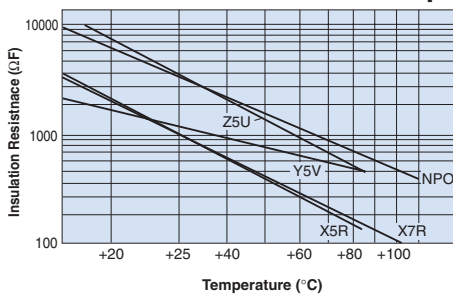
Dielectric	Capacitance Range	Capacitance Tolerance*	Voltage Ratings	Dissipation Factor	T.C.C.	Test Voltage	Operating Temperature	Insulation Resistance
NPO	0.47pF - 0.039μF	.47pF~8.2pF= C:±0.25pF 5.6pF~8.2pF= D±0.5pF 10pF~ 10000pF= F:±1%, G:±2%,J:±5%	16V 25V 50V 100V 200V	For Values >30pF: 0.1% max., ≤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 - 10μF	K: ±10%	6.3V 10V	6.3 = 7.3% 10 = 5.0%	±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	For 50 & 100 volts 2.5% max. 25 = 3.0% 16 = 3.5%	±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	2200pF - 10μF	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
Z5U	2200pF - 1.5μF	Z: +80, -20%	25V 50V	4.0% max.	+22% to -56% max.	0.5 ± 0.2 Vrms	+10°C to +85°C	+25°C 10,000MΩ min. or 1000 MΩ - μF min. whichever is less

* Special tolerances available, please consult factory.

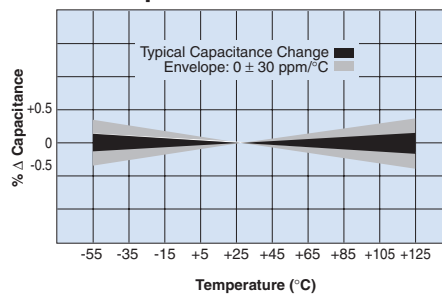
capacitors

environmental applications

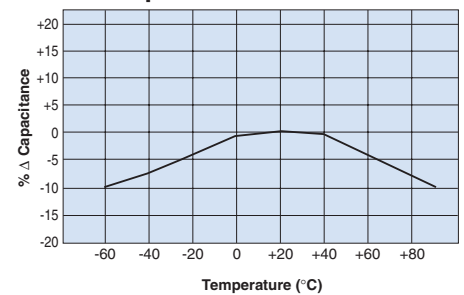
Insulation Resistance vs Temp.



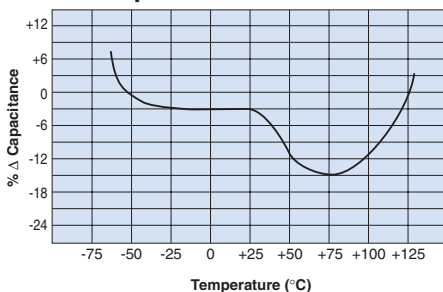
NPO - Temperature Coefficient



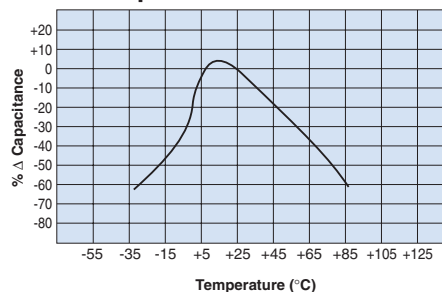
X5R - Temperature Coefficient



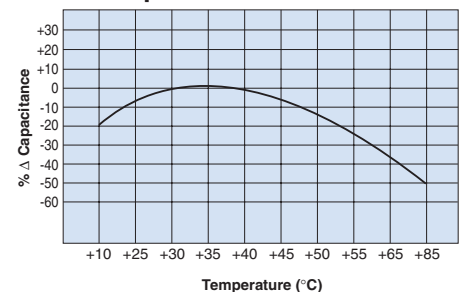
X7R - Temperature Coefficient



Y5V - Temperature Coefficient



Z5U - Temperature Coefficient



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

6/10/05

NPO capacitance voltage availability

Size				0402*			0603*		0805			1206			1210		
Capacitance pF	values µF	Cap. Code	WVDC	16	25	50	50	100	50	100	200	50	100	200	50	200	500
				(C)	(E)	(H)	(H)	(I)	(H)	(I)	(J)	(H)	(I)	(J)	(H)	(J)	(M)
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.

8/05/05

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)	16 (C)	25 (E)
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 pF	Capacitance μF	Cap. Code	16 (C)	25 (E)	50 (H)	10 (A)	16 (C)	25 (E)	50 (H)	100 (I)	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																										

* 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	16	50	10	16	25	50	10	16	25	50	10	16	25	50
			(C)	(H)	(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														

* IR and vapor phase solder only recommended

Capacitance tolerance available: +80, -20%

capacitors

Z5U capacitance voltage availability

Size			0603*		0805	1206	1210
Capacitance values pF	μF	Cap. Code	25 (E)	50 (H)	50 (H)	50 (H)	50 (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					
1500000	1.5	155					

* IR and vapor phase solder only recommended

Capacitance tolerance: +80, -20%

capacitors