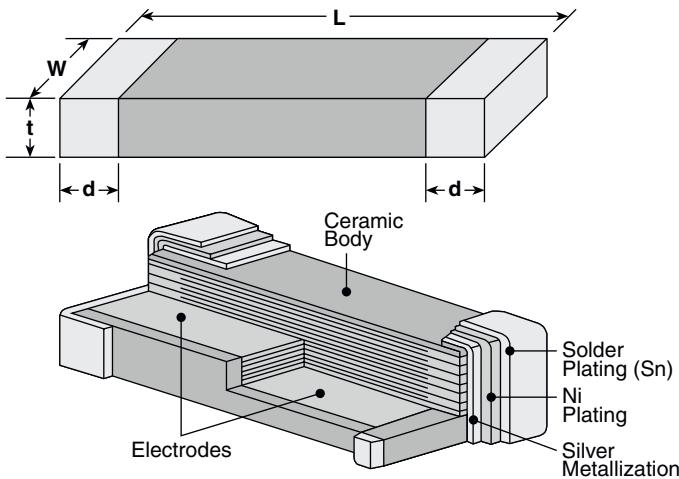




## features

- 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

## dimensions and construction



Case Size	Dimensions inches (mm)			
	L	W	t (Max.)	d
<b>0402</b>	.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)
<b>0603</b>	.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)
<b>0805</b>	.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)
<b>1206</b>	.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)
<b>1210</b>	.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 Tolerance	Voltage Ratings	Dissipation Factor	T.C.C.	Test Voltage	Operating Temperature	Insulation Resistance
NPO	.47pF~8.2pF= C:±0.25pF 5.6pF~8.2pF= D±0.5pF 10pF~ 10000pF= F:±1%, G:±2%,J:±5%	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	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	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	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

For complete environmental specifications, please refer to [www.koaspeer.com](http://www.koaspeer.com)

## X5R capacitance voltage availability

Size			0402	0603		0805	1206	1210
Capacitance values pF	μF	Cap. Code	10 (A)	6.3 (K)	10 (A)	6.3 (K)	10 (A)	10 (A)
56000	0.056	563						
68000	0.068	683						
82000	0.082	823						
100000	0.10	104						
120000	0.12	124						
150000	0.15	154						
180000	0.18	184						
220000	0.22	224						
270000	0.27	274						
330000	0.33	334						
470000	0.47	474						
560000	0.56	564						
680000	0.68	684						
820000	0.82	824						
1000000	1.0	105						
1200000	1.2	125						
1500000	1.5	155						
1800000	1.8	185						
2200000	2.2	225						
3300000	3.3	335						
4700000	4.7	475						
6800000	6.8	685						
10000000	10	106						
22000000	22	226						
47000000	47	476						
100000000	100	107						

Capacitance tolerance available: ±10%

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

1/05/13

## NPO capacitance voltage availability

Size			0402*	0603*		0805			1206		
pF	Capacitance values		50 (H)	50 (H)	100 (I)	50 (H)	100 (I)	200 (J)	50 (H)	100 (I)	200 (J)
	μF	Cap. Code									
0.47	.00000047	R47									
0.56	.00000056	R56									
0.68	.00000068	R68									
0.82	.00000082	R82									
1	.0000010	1R0									
1.2	.0000012	1R2									
1.5	.0000015	1R5									
1.8	.0000018	1R8									
2.2	.0000022	2R2									
2.7	.0000027	2R7									
3.3	.0000033	3R3									
3.9	.0000039	3R9									
4.7	.0000047	4R7									
5.6	.0000056	5R6									
6.8	.0000068	6R8									
8.2	.0000082	8R2									
10	.000010	100									
12	.000012	120									
15	.000015	150									
18	.000018	180									
22	.000022	220									
27	.000027	270									
33	.000033	330									
39	.000039	390									
47	.000047	470									
56	.000056	560									
68	.000068	680									
82	.000082	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									

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Capacitance tolerance available:

.47pF~8.2pF = C: ±0.25pF

5.6pF~8.2pF = D: ±0.5pF

10pF~10000pF = F: ±1%, G: ±2%, J: ±5%

## 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)	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%

## Y5V capacitance voltage availability

Size			0402	0603			0805				1206			
Capacitance values pF	μF	Cap. Code	16	16	25	50	10	16	25	50	10	16	25	50
			(C)	(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%

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