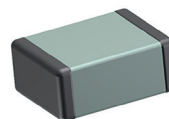


### • Applications

**NPO COG** : Ultra stable ceramic  
Timing and tuning circuits  
High frequency filtering



RoHS  
compliant

### • Electrical Parameters

**Electrical Characteristics** at + 25°C unless otherwise specified  
**Operating Temperature** - 55°C, + 125°C  
**Temperature Coefficient** ± 30ppm  
**Dissipation Factor** < 10.10<sup>-4</sup> at 1Vrms and 1kHz (or 1MHz)

#### Insulation Resistance (IR)

25°C/Un 10<sup>5</sup> MOhm or 1000 Ohm-Farad whichever is less  
125°C/Un 10<sup>4</sup> MOhm or 100 Ohm-Farad whichever is less

#### Dielectric Strength Test

Performed per method 103 of EIA 198-2-E  
Applied test voltages :  
≤ 100Vdc-rated : 250% of rated voltage

### • Quick Reference Data

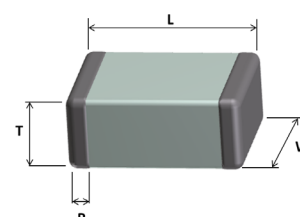
	0402	0603	0805	1206	1210	1812	1825	2220	2225
16V	0.47pF - 470pF	0.47pF - 1.8nF	0.47pF - 5.6nF	0.47pF - 10nF	0.47pF - 18nF				
25V	0.47pF - 390pF	0.47pF - 1.5nF	0.47pF - 4.7nF	0.47pF - 8.2nF	0.47pF - 15nF	0.47pF - 39nF	0.47pF - 56nF	0.47pF - 82nF	0.47pF - 100nF
50V	0.47pF - 330pF	0.47pF - 1.2nF	0.47pF - 3.9nF	0.47pF - 6.8nF	0.47pF - 12nF	0.47pF - 33nF	0.47pF - 47nF	0.47pF - 68nF	0.47pF - 82nF
100V	0.47pF - 220pF	0.47pF - 680pF	0.47pF - 3.3nF	0.47pF - 5.6nF	0.47pF - 10nF	0.47pF - 27nF	0.47pF - 39nF	0.47pF - 56nF	0.47pF - 68nF

### • Ordering Information

0805	A	220	J	A	P	B	XX
SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	VOLTAGE	TERMINATION	PACKAGING	SPECIAL PARAMETERS
0402 0603 0805 1206 1210 1812 1825 2220 2225	A = COG	Expressed in picofarads (pF). The first two digits are significant, the third digit give the number of noughts. Example : 102 = 1 000pF	C = ± 0.25pF D = ± 0.5pF H = ± 0.05% E = ± 0.1% A = ± 0.5% F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20% Z = - 20%, + 80%	J = 16V X = 25V A = 50V B = 100V	F = Palladium-Silver W = Silver with Gold plated finish X = Nickel with Tin plated finish P = Polymer with Tin plated finish C = Copper with Tin plated finish	B = 7" reel V = Bulk W = Waffle Pack	

### • Dimensions in millimeters

Designation	0402	0603	0805	1206	1210	1812	1825	2220	2225
Length (L)	1.00 ± 0.1	1.60 ± 0.1	2.00 ± 0.2	3.20 ± 0.2	3.20 ± 0.2	4.50 ± 0.3	4.50 ± 0.3	5.70 ± 0.4	5.70 ± 0.4
Width (W)	0.50 ± 0.1	0.80 ± 0.1	1.25 ± 0.2	1.60 ± 0.2	2.50 ± 0.2	3.20 ± 0.2	6.40 ± 0.3	5.00 ± 0.4	6.40 ± 0.4
Thickness (T)	0.60	0.90	1.40	1.70	1.70	2.80	2.50	4.00	4.50
Termination (P)	Min	0.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Max	0.40	0.40	0.70	0.70	0.80	1.00	1.00	1.00



For P termination (Polymer type) add 0.20mm to all dimensions (except for 0402).

• Standard Sizes : 0402 to 1206

SIZE		0402				0603				0805				1206			
Voltage (Vdc)		16	25	50	100	16	25	50	100	16	25	50	100	16	25	50	100
Cap. Code	Cap.																
0R47	0.47pF																
1R0	1pF																
1R2	1.2pF																
1R5	1.5pF																
1R8	1.8pF																
2R2	2.2pF																
2R7	2.7pF																
3R3	3.3pF																
3R9	3.9pF																
4R7	4.7pF																
5R6	5.6pF																
6R8	6.8pF																
8R2	8.2pF																
100	10pF																
120	12pF																
150	15pF																
180	18pF																
220	22pF																
270	27pF																
330	33pF																
390	39pF																
470	47pF																
560	56pF																
680	68pF																
820	82pF																
101	100pF																
121	120pF																
151	150pF																
181	180pF																
221	220pF																
271	270pF																
331	330pF																
391	390pF																
471	470pF																
561	560pF																
681	680pF																
821	820pF																
102	1nF																
122	1.2nF																
152	1.5nF																
182	1.8nF																
222	2.2nF																
272	2.7nF																
332	3.3nF																
392	3.9nF																
472	4.7nF																
562	5.6nF																
682	6.8nF																
822	8.2nF																
103	10nF																
123	12nF																
153	15nF																
183	18nF																
223	22nF																
273	27nF																
333	33nF																
393	39nF																
473	47nF																
563	56nF																
683	68nF																
823	82nF																
104	100nF																
124	120nF																
154	150nF																
224	220nF																
274	270nF																
334	330nF																

Other sizes available on request. Example : 0504, 0907, 1808, 3033.

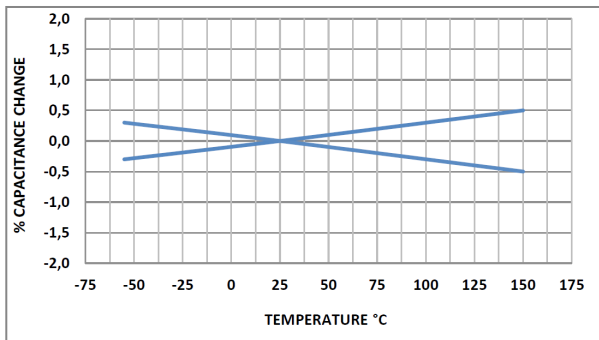
• Standard Sizes : 1210 to 2225

SIZE		1210				1812			1825			2220			2225		
Voltage (Vdc)		16	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100
Cap. Code	Cap.																
0R47	0.47pF																
1R0	1pF																
1R2	1.2pF																
1R5	1.5pF																
1R8	1.8pF																
2R2	2.2pF																
2R7	2.7pF																
3R3	3.3pF																
3R9	3.9pF																
4R7	4.7pF																
5R6	5.6pF																
6R8	6.8pF																
8R2	8.2pF																
100	10pF																
120	12pF																
150	15pF																
180	18pF																
220	22pF																
270	27pF																
330	33pF																
390	39pF																
470	47pF																
560	56pF																
680	68pF																
820	82pF																
101	100pF																
121	120pF																
151	150pF																
181	180pF																
221	220pF																
271	270pF																
331	330pF																
391	390pF																
471	470pF																
561	560pF																
681	680pF																
821	820pF																
102	1nF																
122	1.2nF																
152	1.5nF																
182	1.8nF																
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472	4.7nF																
562	5.6nF																
682	6.8nF																
822	8.2nF																
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273	27nF																
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823	82nF																
104	100nF																
124	120nF																
154	150nF																
224	220nF																
274	270nF																
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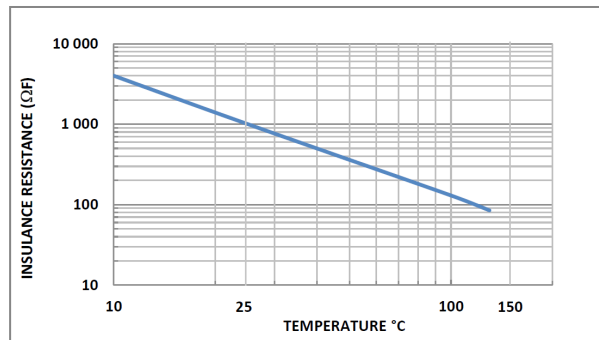
Other sizes available on request. Example : 0504, 0907, 1808, 3033.

• **Typical Characteristics**

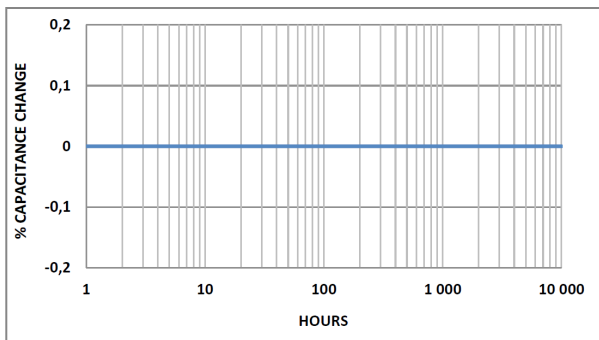
**Temperature coefficient of capacitance**



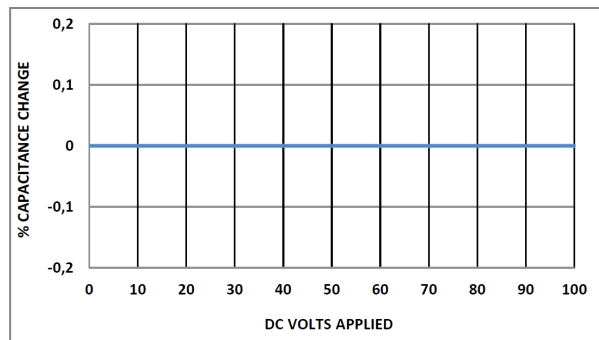
**Insulation resistance vs. temperature**



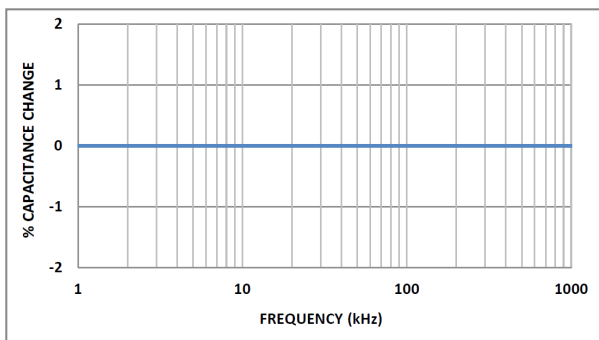
**Aging rate**



**Voltage coefficient of capacitance**



**Change of Capacitance with Frequency**



**Dissipation factor vs. frequency**

