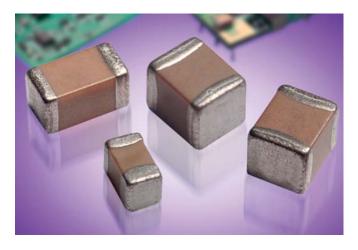
COG (NPO) Dielectric

General Specifications

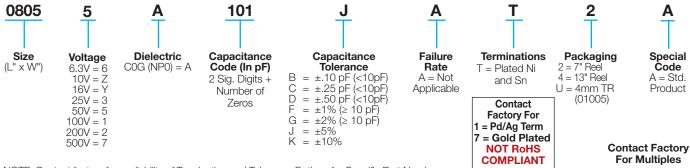


COG (NP0) is the most popular formulation of the "temperature-compensating," EIA Class I ceramic materials. Modern COG (NP0) formulations contain neodymium, samarium and other rare earth oxides.

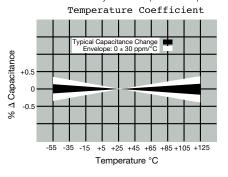
COG (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is 0 $\pm 30 ppm/^{\circ}C$ which is less than $\pm 0.3\%$ ΔC from -55°C to +125°C. Capacitance drift or hysteresis for COG (NP0) ceramics is negligible at less than $\pm 0.05\%$ versus up to $\pm 2\%$ for films. Typical capacitance change with life is less than $\pm 0.1\%$ for COG (NP0), one-fifth that shown by most other dielectrics. COG (NP0) formulations show no aging characteristics.

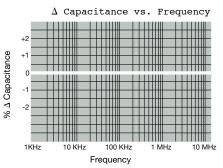
PART NUMBER (see page 2 for complete part number explanation)

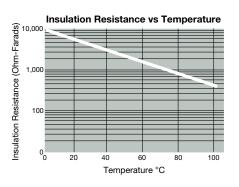


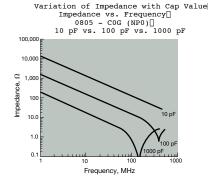


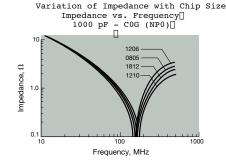
NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.

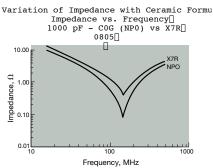












C0G (NP0) Dielectric



Specifications and Test Methods

	ter/Test	NP0 Specification Limits	Measuring Conditions						
Operating Temp		-55°C to +125°C	Temperature Cycle Chamber						
Capac	itance	Within specified tolerance	Freq.: 1.0 MHz ± 10% for cap ≤ 1000 pF						
)	<30 pF: Q≥ 400+20 x Cap Value	1.0 kHz ± 10% for cap > 1000 pF						
	<u> </u>	≥30 pF: Q≥ 1000	Voltage: 1.0Vrms ± .2V						
Insulation	Resistance	100,000MΩ or 1000MΩ - μF,	Charge device with rated voltage for						
		whichever is less	60 ± 5 secs @ room temp/humidity Charge device with 300% of rated voltage for						
Dielectric	Strength	No breakdown or visual defects	1-5 seconds, w/charge and discharge current limited to 50 mA (max)						
			Note: Charge device with 150% of rated voltage for 500V devices.						
	Appearance	No defects	Deflection: 2mm						
Resistance to	Capacitance Variation	±5% or ±.5 pF, whichever is greater	Test Time: 30 seconds Thm/sec						
Flexure Stresses	Q	Meets Initial Values (As Above)	90 mm						
	Insulation Resistance	≥ Initial Value x 0.3							
Solder	rability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 ± 5°C for 5.0 ± 0.5 seconds						
	Appearance	No defects, <25% leaching of either end terminal							
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater	Dip device in eutectic solder at 260°C for 60						
Resistance to Solder Heat	Q	Meets Initial Values (As Above)	seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.						
	Insulation Resistance	Meets Initial Values (As Above)							
	Dielectric Strength	Meets Initial Values (As Above)							
	Appearance	No visual defects	Step 1: -55°C ± 2° 30 ± 3 minutes						
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater	Step 2: Room Temp ≤ 3 minutes						
Thermal Shock	Q	Meets Initial Values (As Above)	Step 3: +125°C ± 2° 30 ± 3 minutes						
Onook	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp ≤ 3 minutes						
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 hours at room temperature						
	Appearance	No visual defects							
	Capacitance Variation	≤ ±3.0% or ± .3 pF, whichever is greater	Charge device with twice rated voltage in						
Load Life	Q (C=Nominal Cap)	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C	test chamber set at 125°C ± 2°C for 1000 hours (+48, -0). Remove from test chamber and stabilize at room temperature for 24 hours before measuring.						
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)							
	Dielectric Strength	Meets Initial Values (As Above)							
Load Humidity	Appearance	No visual defects							
	Capacitance Variation	≤ ±5.0% or ± .5 pF, whichever is greater	Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied.						
	Q	≥ 30 pF: Q≥ 350 ≥10 pF, <30 pF: Q≥ 275 +5C/2 <10 pF: Q≥ 200 +10C							
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from chamber and stabilize at room temperature for 24 ± 2 hours						
	Dielectric Strength	Meets Initial Values (As Above)	before measuring.						

C0G (NP0) Dielectric

Capacitance Range

*EIA 01005

PREFERRED SIZES ARE SHADED

			•		₩.							
SIZE	0101*	0201	0402		0603	0805	1206					
Soldering	Reflow Only	Reflow Only	Reflow/Wave	Refl	low/Wave	Reflow/Wave	Reflow/Wave					
Packaging	All Paper 0.40 ± 0.02	All Paper 0.60 ± 0.09	All Paper 1.00 ± 0.10		II Paper 60 ± 0.15	Paper/Embossed 2.01 ± 0.20	Paper/Embossed					
(L) Length mm (in.)	(0.016 ± 0.0008)	(0.024 ± 0.004)	(0.040 ± 0.004)	(0.00	63 ± 0.006)	(0.079 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)					
(W) Width mm (in.)	0.20 ± 0.02 (0.008 ± 0.0008)	0.30 ± 0.09 (0.011 ± 0.004)	0.50 ± 0.10 (0.020 ± 0.004)		81 ± 0.15 32 ± 0.006)	1.25 ± 0.20 (0.049 ± 0.008)	1.60 ± 0.20 (0.063 ± 0.008)					
(t) Terminal mm	0.10 ± 0.04	0.15 ± 0.05	0.25 ± 0.15	0.0	35 ± 0.15	0.50 ± 0.25	0.50 ± 0.25					
WVDC	(0.004 ± 0.0016) 16	(0.006 ± 0.002) 25 50	(0.010 ± 0.006) 16 25 50	16 25	14 ± 0.006) 50 100 200	(0.020 ± 0.010) 16 25 50 100 200	(0.020 ± 0.010) 16 25 50 100 200 500					
Cap 0.5		А	C C C	G G	G G	J J J J J]]]]]]					
(pF) 1.0 1.2	B B	A A		G G G	G G G							
1.5	В	A A		G G	G G	J J J J	J J J J J J					
1.8 2.2	B B	A A		G G	G G G							
2.7	В	A A	C C C	G G	G G	J J J J J	J J J J J J					
3.3 3.9	B B	A A		G G G	G G G							
4.7	В	A A	C C C	G G	G G	J J J J	1 1 1 1 1					
5.6 6.8	B B	A A		G G G	G G G							
8.2	В	A A	C C C	G G	G G	J J J J J	JJJJJJ					
10 12	B B	A A		G G G	G G G G G G							
15	В	A A	C C C	G G	G G G	J J J J J	JJJJJJ					
18 22	B B	A A		G G G	G G G G G G	J J J J J						
27	В	A A	C C C	G G	G G G]]]]]	J J J J J J					
33 39	B B	A A		G G G	G G G G G G							
47	В	A A	C C C	G G	G G G	J J J J J	JJJJJJ					
56 68	B B	A A		G G G	G G G G G G							
82	В	A A	<u> </u>	G G	G G G	J J J J]]]]]]					
100 120	В	A A		G G G	G G G G G G	J J J J J						
150 180			C C C	G G	G G G	J J J J J	J J J J J J					
220				G G	G G G	J J J J J J						
270			C C C	G G	G G	J J J J J	J J J J J M					
390			C C C	G G	G G	j j j j	JJJJJM					
<u>470</u> 560			C C C	G G	G G	J J J J J	J J J J J M					
680			C C C	G G	G G	J J J J J	J J J J J P					
820 1000			C C C	G G	G G G	J J J J J	J J J J M					
1200				G G	G	J J J	J J J Q					
1500 1800				G G	G	J J J J N	J J J M Q					
2200 2700				G G G	G G	N N N N N N N N	J J M P Q J J M P Q					
3300				G G	G	P P P N	J J M P Q					
3900 4700				G G G	G G	PPPN PPPN	J J M P J J M P					
5600				u u	u l	P P P	J J M P					
6800 8200		→	- IN			P P P	M M M P M P					
Cap 0.010						P P P	P P P					
(μF) 0.012 0.015)									
0.018 0.022			1									
0.027			t 1									
0.033			I				-					
0.047												
0.068 0.082												
0.1		05	40 5	10 ==	50 400 500	10 05 55 133						
SIZE	16 0101*	25 50 0201	16 25 50 0402	16 25	50 100 200 0603	16 25 50 100 200 0805	16 25 50 100 200 500 1206					
Letter	A B	<u> </u>	I E I G	J	K M	N P Q	X Y Z					
Max.	0.33 0.23	2 0.56	0.71 0.9	0.94	1.02 1.27	1.40 1.52 1.78	2.29 2.54 2.79					
Thickness (0	.013) (0.00	, , , ,	(0.028) (0.03	5) (0.037)	(0.040) (0.050)	(0.055) (0.060) (0.070)	(0.090) (0.100) (0.110)					
	PAPER EMBOSSED											

PAPER and EMBOSSED available for 01005

C0G (NP0) Dielectric



Capacitance Range

PREFERRED SIZES ARE SHADED

SIZ	SIZE 1210		1812				1825			2220			2225								
Solde		Reflow Only			Reflow Only				Reflow Only			Reflow Only			Reflow Only						
Packa	ging mm	Paper/Embossed 3.20 ± 0.20			All Embossed 4.50 ± 0.30				All Embossed 4.50 ± 0.30			All Embossed 5.70 ± 0.40			All Embossed 5.72 ± 0.25						
(L) Length	(in.)	(0.126 ± 0.008) 2.50 ± 0.20				(0.177 ± 0.012) 3.20 ± 0.20					(0.177 ± 0.012) 6.40 ± 0.40			(0.225 ± 0.016) 5.00 ± 0.40			(0.225 ± 0.010) 6.35 ± 0.25				
(W) Width	(in.)	(0.098 ± 0.008)			(0.126 ± 0.008)					(0.252 ± 0.016) 0.61 ± 0.36			(0.197 ± 0.016)			(0.250 ± 0.010)					
(t) Terminal	mm (in.)	(0.020 ± 0.010)			0.61 ± 0.36 (0.024 ± 0.014)					(0.024 ± 0.014)			0.64 ± 0.39 (0.025 ± 0.015)			0.64 ± 0.39 (0.025 ± 0.015)					
Cap	WVDC 0.5	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200	
(pF)	1.0 1.2																				
	1.5 1.8															-		l			
	2.2																.1~	>	≪w	~	
	3.3															† `	< <u>_</u> _	\leq) <u></u>	
	3.9 4.7															L	<u></u>	J.		1	
	5.6 6.8																	a-t			
	8.2 10					J										+		l			
	12 15					J															
	18 22					J															
	27 33					J															
	39 47					J J															
	56 68					J															
	82 100					J															
	120					J															
	150 180					J															
	220 270					J															
	330 390					M															
	470 560	J	J	J	J	M M															
	680 820	J	J	J	K	P P															
	1000 1200	J	J P	P	P	P P	K K	K K	N N	N N	M M	M M	M M	M M				M M	M M	P P	
	1500	Р	Р	Р	Р	Р	K	K	N	N	М	М	М	М				М	М	Р	
	1800 2200	P P	P P	P P	P P	P N	K K	K K	N N	N N	M P	M X	M X	M M				M M	M M	P P	
	2700 3300	P P	P P	P P	P P		K K	K	N N	P P	Q Q	X	X	M X			X	M M	M M	P P	
	3900 4700	P P	P P	P P			K K	K K	N N	P P	Q Y	X X	X	X X	Х	X	X	M M	M M	P P	
	5600 6800	P P	P P	P P			K K	K K	P Q	P Q	Y	X	X	X	X	X	X	M M	M M	P P	
Can	8200 0.010	P N	P N				K K	M M	Q Q	Q Q		X	X	X	X	X	X	M M	M M	P	
Cap (µF)	0.012	N N	N N				K	M	Q	Q		X	Х	Х	Х	Х	X	М	М	Р	
	0.015						P P	P	Q			X	X	X	X	X	X	M	M	Y	
	0.022 0.027						P Q	P Q	Q X			X X	X	X Y	X X	X		M P	Y Y	Y	
	0.033 0.039						Q X	Q X	X			X X	Х		X Y	Х		X X	Y Y	Y	
	0.047 0.068						X Z	X Z	X Y			Х			Y Z			X	Z Z		
	0.082						Z	Z	Υ						Z			Х	Z		
	0.1 WVDC	25	50	100	200	500	Z 25	50	100	200	500	50	100	200	Z 50	100	200	50	100	200	
Letter	SIZE A	C		1210	G			K	1812	N		P	1825			2220	Z		2225		
Max.	0.33	0.5	6	0.71	0.90	0.9	94	1.02	1.27	1.4	40	1.52	1.78	2.	29	2.54	2.79) ·			
Thickness	(0.013)) (0.022) (0.028) (0.035) (0.037 PAPER						(0.040) (0.050) (0.055) (0				0.060) (0.070) (0.090) EMBOSSED				(0.100)	(0.110)			
		TALEN LIVIDOGGED																			