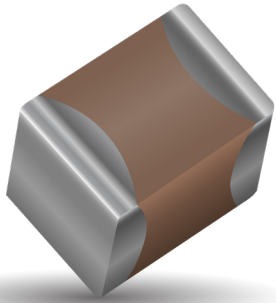


COG (NP0) Dielectric

General Specifications



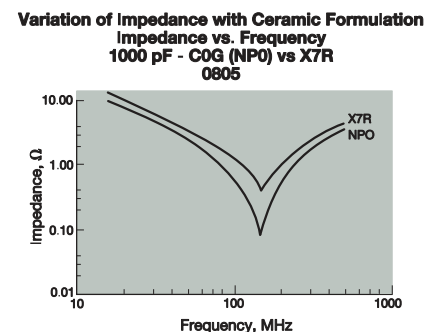
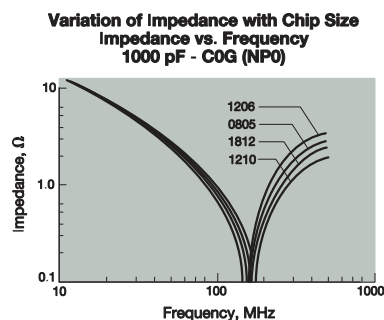
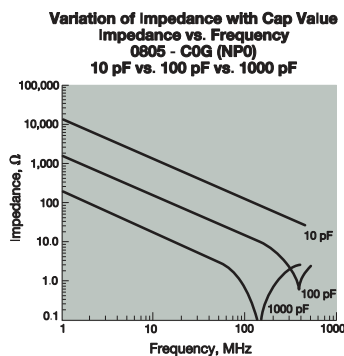
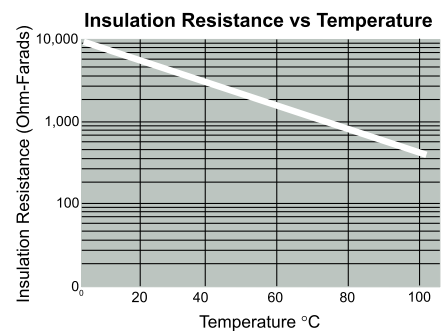
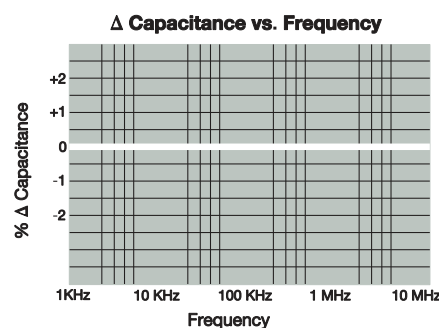
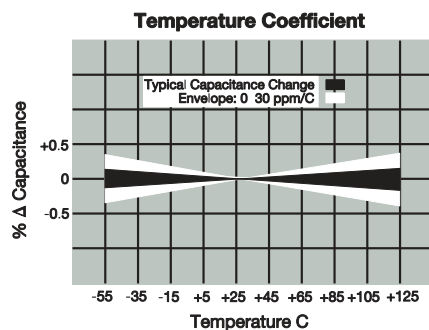
COG (NP0) is the most popular formulation of the “temperature-compensating,” EIA Class I ceramic materials. Modern COG (NP0) formulations contain neodymium, samarium and other rare earth oxides. COG (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is $0 \pm 30 \text{ ppm}/^\circ\text{C}$ which is less than $\pm 0.3\%$ C from -55°C to $+125^\circ\text{C}$. 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 4 for complete part number explanation)



0805	5	A	101	J	A	T	2	A
Size (L" x W")	Voltage 6.3V = 6 10V = Z 16V = Y 25V = 3 50V = 5 100V = 1 200V = 2 250V = V 500V = 7	Dielectric COG (NP0) = A	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance B = $\pm 10 \text{ pF}$ (<10pF) C = $\pm 25 \text{ pF}$ (<10pF) D = $\pm 50 \text{ pF}$ (<10pF) F = $\pm 1\%$ ($\geq 10 \text{ pF}$) G = $\pm 2\%$ ($\geq 10 \text{ pF}$) J = $\pm 5\%$ K = $\pm 10\%$	Failure Rate A = Not Applicable	Terminations T = Plated Ni and Sn	Packaging 2 = 7" Reel 4 = 13" Reel U = 4mm TR (01005)	Special Code A = Std. Product
						Contact Factory For 1 = Pd/Ag Term 7 = Gold Plated NOT RoHS COMPLIANT		Contact Factory For Multiples

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



The Important Information/Disclaimer is incorporated in these specifications by reference and should be reviewed in full before placing any order.

COG (NP0) Dielectric

Specifications and Test Methods



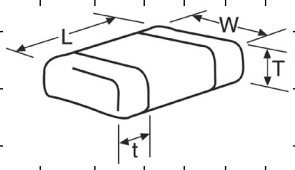
Parameter/Test		NPO Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance <30 pF: Q ≥ 400+20 x Cap Value ≥30 pF: Q ≥ 1000	Freq.: 1.0 MHz ± 10% for cap ≤ 1000 pF 1.0 kHz ± 10% for cap > 1000 pF Voltage: 1.0Vrms ± .2V	
Q				
Insulation Resistance		100,000MΩ or 1000MΩ - μF, whichever is less	Charge device with rated voltage for 60 ± 5 secs @ room temp/humidity	
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.	
Resistance to Flexure Stresses	Appearance	No defects		
	Capacitance Variation	±5% or ±.5 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	≥ Initial Value x 0.3		
Solderability		≥ 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	
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal	Dip device in eutectic solder at 260°C for 60sec- onds. Store at room temperature for 24 ± 2hours before measuring electrical properties.	
	Capacitance Variation	≤ ±2.5% or ±.25 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Thermal Shock	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
	Q	Meets Initial Values (As Above)	Step 3: +125°C ± 2°	30 ± 3 minutes
	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	
Load Life	Appearance	No visual defects	Charge device with twice rated voltage in 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.	
	Capacitance Variation	≤ ±3.0% or ± .3 pF, whichever is greater		
	Q (C=Nominal Cap)	≥ 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)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	≤ ±5.0% or ± .5 pF, whichever is greater		
	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)		
	Dielectric Strength	Meets Initial Values (As Above)		

COG (NP0) Dielectric Capacitance Range



PREFERRED SIZES ARE SHADED

SIZE	0101*			0201			0402			0603				0805					1206				
Soldering	Reflow Only			Reflow Only			Reflow/Wave			Reflow/Wave				Reflow/Wave					Reflow/Wave				
Packaging	All Paper			All Paper			All Paper			All Paper				Paper/Embossed					Paper/Embossed				
(L) Length	0.40 ± 0.02 (0.016 ± 0.0008)			0.60 ± 0.09 (0.024 ± 0.004)			1.00 ± 0.10 (0.040 ± 0.004)			1.60 ± 0.15 (0.063 ± 0.006)				2.01 ± 0.20 (0.079 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)				
(W) Width	0.20 ± 0.02 (0.008 ± 0.0008)			0.30 ± 0.09 (0.011 ± 0.004)			0.50 ± 0.10 (0.020 ± 0.004)			0.81 ± 0.15 (0.032 ± 0.006)				1.25 ± 0.20 (0.049 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)				
(t) Terminal	0.10 ± 0.04 (0.004 ± 0.0016)			0.15 ± 0.05 (0.006 ± 0.002)			0.25 ± 0.15 (0.010 ± 0.006)			0.35 ± 0.15 (0.014 ± 0.006)				0.50 ± 0.25 (0.020 ± 0.010)					0.50 ± 0.25 (0.020 ± 0.010)				
WVDC	16			25			50			16				25					50				
Cap (pF)	0.5			A			C			G				J					J				
1.0	B			A			C			G				J					J				
1.2	B			A			C			G				J					J				
1.5	B			A			C			G				J					J				
1.8	B			A			C			G				J					J				
2.2	B			A			C			G				J					J				
2.7	B			A			C			G				J					J				
3.3	B			A			C			G				J					J				
3.9	B			A			C			G				J					J				
4.7	B			A			C			G				J					J				
5.6	B			A			C			G				J					J				
6.8	B			A			C			G				J					J				
8.2	B			A			C			G				J					J				
10	B			A			C			G				J					J				
12	B			A			C			G				J					J				
15	B			A			C			G				J					J				
18	B			A			C			G				J					J				
22	B			A			C			G				J					J				
27	B			A			C			G				J					J				
33	B			A			C			G				J					J				
39	B			A			C			G				J					J				
47	B			A			C			G				J					J				
56	B			A			C			G				J					J				
68	B			A			C			G				J					J				
82	B			A			C			G				J					J				
100	B			A			C			G				J					J				
120										G				J					J				
150										G				J					J				
180										G				J					J				
220										G				J					J				
270										G				J					J				
330										G				J					J				
390										G				J					J				
470										G				J					J				
560										G				J					J				
680										G				J					J				
820										G				J					J				
1000										G				J					J				
1200										G				J					J				
1500										G				J					J				
1800										G				J					J				
2200										G				J					J				
2700										G				J					J				
3300										G				J					J				
3900										G				J					J				
4700										G				J					J				
5600										G				J					J				
6800										G				J					J				
8200										G				J					J				
Cap (µF)	0.010			A			C			G				J					J				
0.012	P			P			P			P				P					P				
0.015	P			P			P			P				P					P				
0.018	P			P			P			P				P					P				
0.022	P			P			P			P				P					P				
0.027	P			P			P			P				P					P				
0.033																							
0.039																							
0.047																							
0.068																							
0.082																							
0.1																							
WVDC	16			25			50			16				25					50				
SIZE	0101*			0201			0402			0603				0805					1206				



Letter	A	B	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.22 (0.009)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER						EMBOSS							

IMPORTANT INFORMATION/DISCLAIMER

All product specifications, statements, information and data (collectively, the “Information”) in this datasheet or made available on the website are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on AVX’s knowledge of typical operating conditions for such applications, but are not intended to constitute and AVX specifically disclaims any warranty concerning suitability for a specific customer application or use.

ANY USE OF PRODUCT OUTSIDE OF SPECIFICATIONS OR ANY STORAGE OR INSTALLATION INCONSISTENT WITH PRODUCT GUIDANCE VOIDS ANY WARRANTY.

The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by AVX with reference to the use of AVX’s products is given without regard, and AVX assumes no obligation or liability for the advice given or results obtained.

Although AVX designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Unless specifically agreed to in writing, AVX has not tested or certified its products, services or deliverables for use in high risk applications including medical life support, medical device, direct physical patient contact, water treatment, nuclear facilities, weapon systems, mass and air transportation control, flammable environments, or any other potentially life critical uses. Customer understands and agrees that AVX makes no assurances that the products, services or deliverables are suitable for any high-risk uses. Under no circumstances does AVX warrant or guarantee suitability for any customer design or manufacturing process.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

AVX:

[12062A102GAT2A](#) [12062A102MAT2A](#) [12062A120FAT2A](#) [12062A120JAT2A](#) [12062A120JAT4A](#) [12062A122GAT2A](#)
[12062A122JAT2A](#) [12062A150FAT2A](#) [12062A180FAT2A](#) [12062A180KAT2A](#) [12062A1R5DAT2A](#) [12062A220FAT2A](#)
[12062A220KAT2A](#) [12062A300FAT2A](#) [12062A331GAT2A](#) [12062A3R0CAT2A](#) [12062A430FAT2A](#) [12062A431JAT2A](#)
[12062A500KAT2A](#) [12062A510JAT2A](#) [12062A510JAT4A](#) [12062A561GAT2A](#) [12062A5R1DAT2A](#) [12062A5R1DAT4A](#)
[12062A600FAT2A](#) [12062A621JAT2A](#) [12062A681GAT2A](#) [12062A821FAT2A](#) [12062A821GAT2A](#) [12062A910FAT2A](#)
[12063A103FA72A](#) [12063A103FAJ2A](#) [12063A103FAT4A](#) [12063A103GAT4A](#) [12063A272GAT2A](#) [12063A562GAT4A](#)
[12063A622JAT2A](#) [12063A682FAT2A](#) [12063A682GAT2A](#) [12063A682JA19A](#) [12063A682KAT2A](#) [12065A102FA12A](#)
[12065A102HAT2A](#) [12065A112FAT2A](#) [12065A122JAT9A](#) [12065A152JA12A](#) [12065A202FAT2A](#) [12065A202GAT2A](#)
[12065A202JAT4A](#) [12065A222MAT2A](#) [12065A242FAT2A](#) [12065A242JAT2A](#) [12065A302GAT2A](#) [12065A332FAT4A](#)
[12065A332GAT4A](#) [12065A362JAT2A](#) [12065A392FAT2A](#) [12065A392JBT1A](#) [12065A472FAJ4A](#) [12065A500JAT2A](#)
[12065A562FAT2A](#) [12065A562GAT2A](#) [12065A562KAT2A](#) [12065A751KA12A](#) [12065A751MAT2A](#) [12065A821GAT2A](#)
[12065A821HAT2A](#) [12065A911FAT2A](#) [12065A911JAT2A](#) [12067A100JAT4A](#) [12067A100MAT2A](#) [12067A101GAT2A](#)
[12067A101JA12A](#) [12067A101JAT4A](#) [12067A101JAT9A](#) [12067A101MAT2A](#) [12067A120GAT2A](#) [12067A120GAT4A](#)
[12067A120JAT2A](#) [12067A121KAT2A](#) [12067A150JAT2A](#) [12067A180GAT2A](#) [12067A180GAT4A](#) [12067A181GAT2A](#)
[12067A181JAT2A](#) [12067A181KAT2A](#) [12067A1R0BAT2A](#) [12067A1R0CAT2A](#) [12067A1R2CAT2A](#) [12067A1R5CAT2A](#)
[12067A1R8CAT2A](#) [12067A200GAT2A](#) [12067A221JA12A](#) [12067A221JAJ2A](#) [12067A240GAT2A](#) [12067A240JAT2A](#)
[12067A270JAT2A](#) [12067A270KAT2A](#) [12067A271JAT2A](#) [12067A271KAT2A](#)