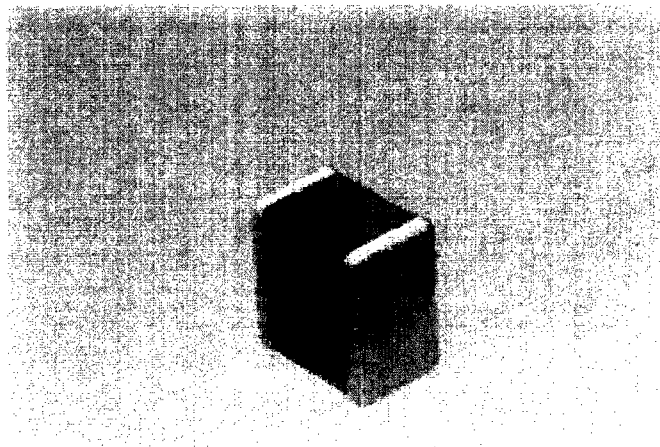


C0G (NP0) Dielectric



General Specifications



C0G (NP0) is the most popular formulation of the "temperature-compensating," EIA Class I ceramic materials. Modern NP0 formulations contain neodymium, samarium and other rare earth oxides.

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 $\pm 0.3\% \Delta C$ from -55°C to $+125^\circ\text{C}$. Capacitance drift or hysteresis for 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 NP0s, one-fifth that shown by most other dielectrics. NP0 formulations show no aging characteristics.

The NP0 formulation usually has a "Q" in excess of 1000 and shows little capacitance or "Q" changes with frequency. Their dielectric absorption is typically less than 0.6% which is similar to mica and most films.

PART NUMBER (see page 7 for complete information and options)

0805

Size
(L" x W")

5

Voltage
25V = 3
50V = 5
100V = 1
200V = 2

A

Dielectric
C0G (NP0) = A

101

Capacitance
Code

J

Capacitance
Tolerance
Preferred
K = $\pm 10\%$
J = $\pm 5\%$

A

Failure
Rate
A = Not
Applicable

T

Terminations
T = Plated Ni
and Solder

2

Packaging
2 = 7" Reel
Paper/Unmarked

A

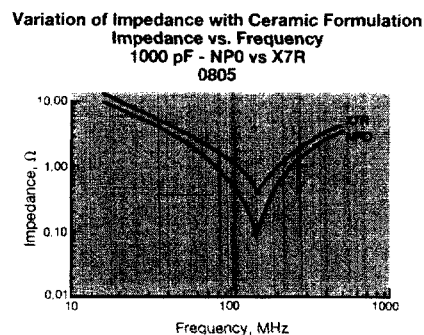
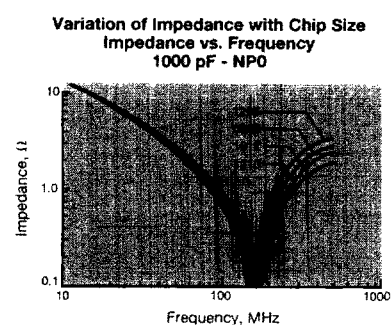
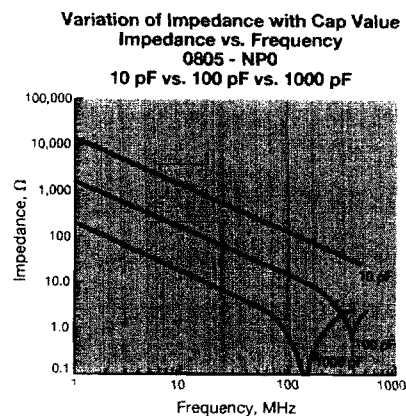
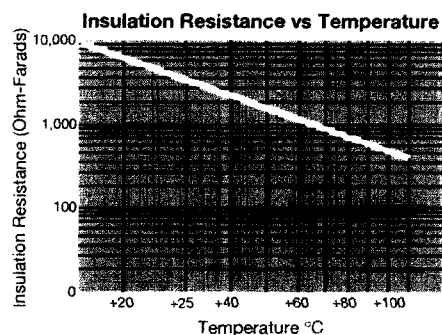
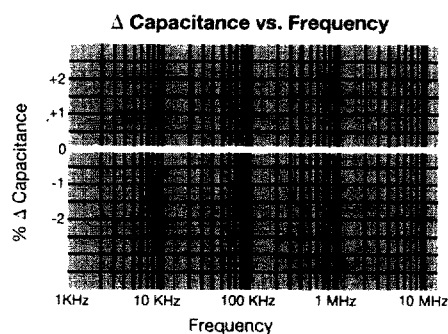
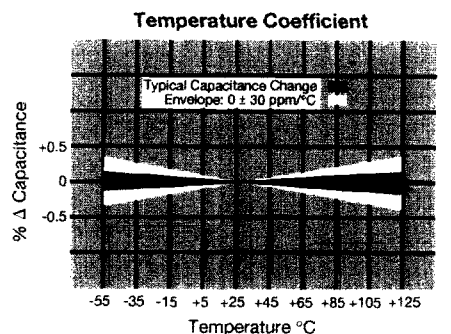
Special
Code
A = Std.
Product

PERFORMANCE CHARACTERISTICS

Capacitance Range	0.5 pF to .068 μF (1.0 ± 0.2 Vrms, 1kHz, for ≤ 100 pF use 1 MHz)
Capacitance Tolerances	Preferred $\pm 5\%$, $\pm 10\%$ others available: $\pm .25$ pF, $\pm .5$ pF, $\pm 1\%$ (≥ 25 pF), $\pm 2\%$ (≥ 13 pF), $\pm 20\%$ For values ≤ 10 pF preferred tolerance is $\pm .5$ pF, also available $\pm .25$ pF.
Operating Temperature Range	-55°C to $+125^\circ\text{C}$
Temperature Characteristic	0 ± 30 ppm/ $^\circ\text{C}$ (EIA C0G)
Voltage Ratings	25, 50, 100 & 200 VDC ($+125^\circ\text{C}$)
Dissipation Factor and "Q"	For values > 30 pF: 0.1% max. ($+25^\circ\text{C}$ and $+125^\circ\text{C}$) For values ≤ 30 pF: "Q" = $400 + 20 \times C$ (C in pF)
Insulation Resistance ($+25^\circ\text{C}$, RVDC)	100,000 megohms min. or 1000 $\text{M}\Omega \cdot \mu\text{F}$ min., whichever is less
Insulation Resistance ($+125^\circ\text{C}$, RVDC)	10,000 megohms min. or 100 $\text{M}\Omega \cdot \mu\text{F}$ min., whichever is less
Dielectric Strength	250% of rated voltage for 5 seconds at 50 mamp max. current
Test Voltage	1 ± 0.2 Vrms
Test Frequency	For values ≤ 100 pF: 1 MHz For values > 100 pF: 1 KHz

C0G (NP0) Dielectric

Typical Characteristic Curves **



SUMMARY OF CAPACITANCE RANGES VS. CHIP SIZE

Style	25V	50V	100V	200V
0402*	0.5pF - 220pF	0.5pF - 120pF	—	—
0504	0.5pF - 330pF	0.5pF - 150pF	0.5pF - 68pF	—
0603*	0.5pF - 1nF	0.5pF - 1nF	0.5pF - 330pF	—
0805*	0.5pF - 4.7nF	0.5pF - 2.2nF	0.5pF - 1nF	0.5pF - 470pF
1206*	0.5pF - 10nF	0.5pF - 4.7nF	0.5pF - 2.2nF	0.5pF - 1nF
1210*	560pF - 10nF	560pF - 10nF	560pF - 3.9nF	560pF - 1.5nF
1505	—	10pF - 1.5nF	10pF - 820pF	10pF - 560pF
1808	→	1nF - 4.7nF	1nF - 3.9nF	1nF - 2.2nF
1812*	1nF - 15nF	1nF - 10nF	1nF - 4.7nF	1nF - 3.3nF
1825*	→	1nF - 22nF	1nF - 12nF	1nF - 6.8nF
2220	→	4.7nF - 47nF	4.7nF - 39nF	3.3nF - 27nF
2225	→	1nF - 68nF	1nF - 39nF	1nF - 39nF

* Standard Sizes

**For additional information on performance changes with operating conditions consult AVX's software SpiCap.



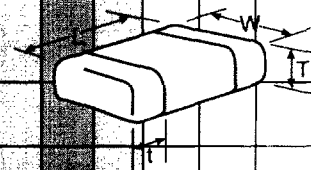
C0G (NP0) Dielectric

Capacitance Range



PREFERRED SIZES ARE SHADED

SIZE		0402*			0504*			0603*			0805				1206				1505			
(L) Length	MM (in.)	1.00 ± .10 (.040 ± .004)			1.27 ± .25 (.050 ± .010)			1.60 ± .15 (.063 ± .006)			2.01 ± .20 (.079 ± .008)				3.20 ± .20 (.126 ± .008)				3.81 ± .25 (.150 ± .010)			
(W) Width	MM (in.)	.50 ± .10 (.020 ± .004)			1.02 ± .25 (.040 ± .010)			.81 ± .15 (.032 ± .006)			1.25 ± .20 (.049 ± .008)				1.60 ± .20 (.063 ± .008)				1.27 ± .25 (.050 ± .010)			
(T) Max. Thickness	MM (in.)	.60 (.024)			1.02 (.040)			.90 (.035)			1.30 (.051)				1.50 (.059)				1.27 (.050)			
(t) Terminal	MM (in.)	.25 ± .15 (.010 ± .006)			.38 ± .13 (.015 ± .005)			.35 ± .15 (.014 ± .006)			.50 ± .25 (.020 ± .010)				.50 ± .25 (.020 ± .010)				.50 ± .25 (.020 ± .010)			
VWDC		25	50		25	50	100	25	50	100	25	50	100	200	25	50	100	200	50	100	200	
Cap (pF)	0.5																					
	1.0																					
	1.2																					
	1.5																					
	1.8																					
	2.2																					
	2.7																					
	3.3																					
	3.9																					
	4.7																					
	5.6																					
	6.8																					
	8.2																					
	10																					
	12																					
	15																					
	18																					
	22																					
	27																					
	33																					
	39																					
	47																					
	56																					
	68																					
	82																					
	100																					
	120																					
	150																					
	180																					
	220																					
	270																					
	330																					
	390																					
	470																					
	560																					
	680																					
	820																					
	1000																					
	1200																					
	1500																					
	1800																					
	2200																					
	2700																					
	3300																					
	3900																					
	4700																					
	5600																					
	6800																					
	8200																					
	10000																					



*IR and vapor phase soldering only recommended.

NOTES:

For higher voltage chips, see pages 24 and 25.

C0G (NP0) Dielectric

Capacitance Range



PREFERRED SIZES ARE SHADED

SIZE		1210				1808*				1812*				1825*				2220				2225*			
(L) Length	MM (in.)	3.20 ± .20 (.126 ± .008)				4.57 ± .25 (.180 ± .010)				4.50 ± .30 (.177 ± .012)				4.50 ± .30 (.177 ± .012)				5.7 ± .40 (.225 ± .016)				5.72 ± .25 (.225 ± .010)			
(W) Width	MM (in.)	2.50 ± .20 (.098 ± .008)				2.03 ± .25 (.080 ± .010)				3.20 ± .20 (.126 ± .008)				6.40 ± .40 (.252 ± .016)				5.0 ± .40 (.197 ± .016)				6.35 ± .25 (.250 ± .010)			
(T) Max. Thickness	MM (in.)	1.70 (.067)				1.52 (.060)				1.70 (.067)				1.70 (.067)				2.30 (.090)				1.70 (.067)			
(t) Terminal	MM (in.)	.50 ± .25 (.020 ± .010)				.64 ± .39 (.025 ± .015)				.61 ± .36 (.024 ± .014)				.61 ± .36 (.024 ± .014)				.64 ± .39 (.025 ± .015)				.64 ± .39 (.025 ± .015)			
WVDC		25	50	100	200	50	100	200		25	50	100	200	50	100	200		50	100	200		50	100	200	
Cap (pF)	560																								
	680																								
	820																								
	1000																								
	1200																								
	1500																								
	1800																								
	2200																								
	2700																								
	3300																								
	3900																								
	4700																								
	5600																								
	6800																								
	8200																								
Cap. (µF)	.010																								
	.012																								
	.015																								
	.018																								
	.022																								
	.027																								
	.033																								
	.039																								
	.047																								
	.068																								



*IR and vapor phase soldering only recommended.

NOTES:
For higher voltage chips, see pages 24 and 25.