

COG (NP0) Dielectric

Specifications and Test Methods



Parameter/Test		NP0 Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance	Freq.: 1.0 MHz $\pm$ 10% for cap $\leq$ 1000 pF 1.0 kHz $\pm$ 10% for cap $>$ 1000 pF Voltage: 1.0Vrms $\pm$.2V	
Q		<30 pF: $Q \geq 400+20 \times \text{Cap Value}$ ≥ 30 pF: $Q \geq 1000$		
Insulation Resistance		100,000M Ω or 1000M Ω - μ F, whichever is less	Charge device with rated voltage for 60 $\pm$ 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	$\pm 5\%$ or ± 5 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value $\times$ 0.3		
Solderability		$\geq 95\%$ of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 $\pm$ 5°C for 5.0 $\pm$ 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 $\pm$ 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 2.5\%$ 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 $\pm$ 2°	30 $\pm$ 3 minutes
	Capacitance Variation	$\leq \pm 2.5\%$ or ± 25 pF, whichever is greater	Step 2: Room Temp	≤ 3 minutes
	Q	Meets Initial Values (As Above)	Step 3: +125°C $\pm$ 2°	30 $\pm$ 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 $\pm$ 2°C for 1000 hours (+48, -0). Remove from test chamber and stabilize at room temperature for 24 hours before measuring.	
	Capacitance Variation	$\leq \pm 3.0\%$ or $\pm .3$ pF, whichever is greater		
	Q (C=Nominal Cap)	≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275 + 5C/2$ <10 pF: $Q \geq 200 + 10C$		
	Insulation Resistance	$\geq$ Initial Value $\times$ 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 $\pm$ 2°C/ 85% $\pm$ 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 5.0\%$ or $\pm .5$ pF, whichever is greater		
	Q	≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275 + 5C/2$ <10 pF: $Q \geq 200 + 10C$		
	Insulation Resistance	$\geq$ Initial Value $\times$ 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

C0G (NP0) Dielectric

Capacitance Range

AVX®

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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	mm	0.40 ± 0.02			0.60 ± 0.09			1.00 ± 0.10			1.60 ± 0.15				2.01 ± 0.20					3.20 ± 0.20					
	(in.)	(0.016 ± 0.0008)			(0.024 ± 0.004)			(0.040 ± 0.004)			(0.063 ± 0.006)				(0.079 ± 0.008)					(0.126 ± 0.008)					
W) Width	mm	0.20 ± 0.02			0.30 ± 0.09			0.50 ± 0.10			0.81 ± 0.15				1.25 ± 0.20					1.60 ± 0.20					
	(in.)	(0.008 ± 0.0008)			(0.011 ± 0.004)			(0.020 ± 0.004)			(0.032 ± 0.006)				(0.049 ± 0.008)					(0.063 ± 0.008)					
(t) Terminal	mm	0.10 ± 0.04			0.15 ± 0.05			0.25 ± 0.15			0.35 ± 0.15				0.50 ± 0.25					0.50 ± 0.25					
	(in.)	(0.004 ± 0.0016)			(0.006 ± 0.002)			(0.010 ± 0.006)			(0.014 ± 0.006)				(0.020 ± 0.010)					(0.020 ± 0.010)					
WVDC		16			25			50			16				25					50					
Cap (pF)	0.5				A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	1.0	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	1.2	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	1.5	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	1.8	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	2.2	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	2.7	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	3.3	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	3.9	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	4.7	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	5.6	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	6.8	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	8.2	B			A	A	C	C	C	G	G	G	G		J	J	J	J	J		J	J	J	J	J
	10	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	12	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	15	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	18	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	22	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	27	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	33	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	39	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	47	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	56	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	68	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	82	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	100	B			A	A	C	C	C	G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	120									G	G	G	G	G	J	J	J	J	J	N	J	J	J	J	J
	150									C	C	C	C	C	G	J	J	J	J	N	J	J	J	J	J
	180									C	C	C	C	C	G	J	J	J	J	J	N	J	J	J	J
	220									C	C	C	C	C	G	J	J	J	J	J	N	J	J	J	J
	270									C	C	C	C	C	G	J	J	J	J	J	N	J	J	J	J
	330									C	C	C	C	C	G	J	J	J	J	J	N	J	J	J	J
	390									C	C	C	C	C	G	J	J	J	J	J		J	J	J	J
	470									C	C	C	C	C	G	J	J	J	J	J		J	J	J	J
	560									C	C	C	C	C	G	J	J	J	J	J		J	J	J	J
	680									C	C	C	C	C	G	J	J	J	J	J		J	J	J	J
	820									C	C	C	C	C	G	J	J	J	J	J		J	J	J	J
	1000									C	C	C	C	C	G	J	J	J	J	J		J	J	J	J
	1200														G	J	J	J	J	J		J	J	J	J
	1500														G	J	J	J	J	J		J	J	J	J
	1800														J	J	J	J	N		J	J	M	M	Q
	2200														N	N	N	N	N		J	J	M	M	Q
	2700														N	N	N	N	N		J	J	M	M	Q
	3300									G	G	G	G		P	N	N	N	N		J	J	M	P	
	3900									G	G	G	G		P	P	P	N	N		J	J	M	P	
	4700									G	G	G	G		P	P	P	N	N		J	J	M	P	
	5600														P	P	P	P			J	J	M	P	
	6800														P	P	P	P		</					

Capacitance Range



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