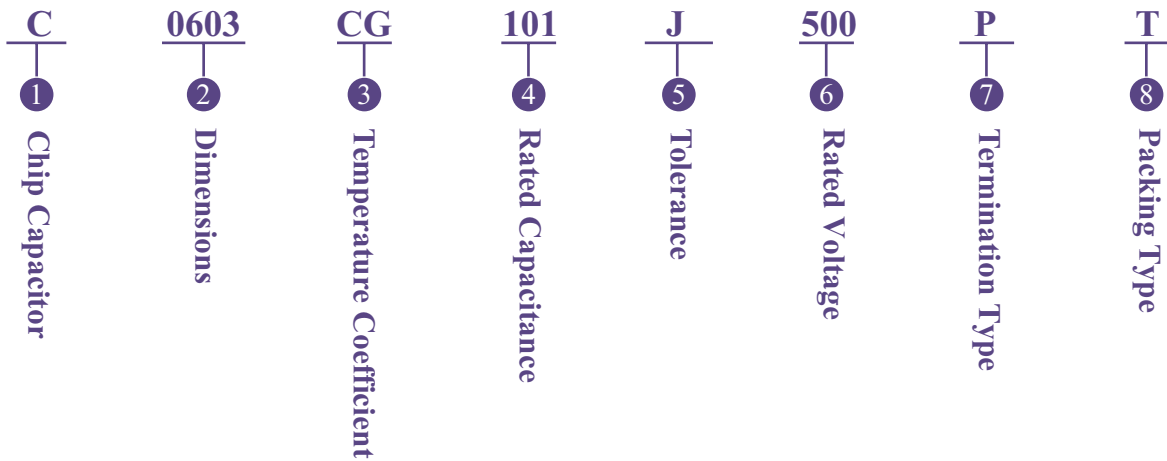


NPO Dielectric Non-Magnetism Multilayer Ceramic Capacitors

◆ Product Features

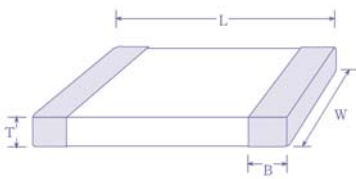
Non-Magnetism, Suitable for MRI

◆ Part Numbering



① Chip Capacitor

② Dimensions



Type	Dimensions(Unit:mm)				
	L	W	T(max)	B(min)	B (max)
0603	1.6 ± 0.1	0.8 ± 0.1	0.8 ± 0.1	0.20	0.50
0805	2.0 ± 0.2	1.2 ± 0.2	1.40	0.25	0.70
1206	3.2 ± 0.2	1.6 ± 0.2	1.40	0.25	0.76

③ Temperature Coefficient

Code(EIA)	Temperature Coefficients	Operating Temperature Range
CG(C0G)	0 ± 30ppm/°C	-55 °C ~ +125 °C

④ Rated Capacitance

Code	Capacitance
1R5	1.5pF
101	100pF

⑥ Rated voltage

Code	Rated Voltage(DC)
500	50V
101	100V
201	200V

⑧ Packing Type

Code	Packing Type
T	Tape carrier packing
B	Bulk packing in a bag

⑤ Tolerance

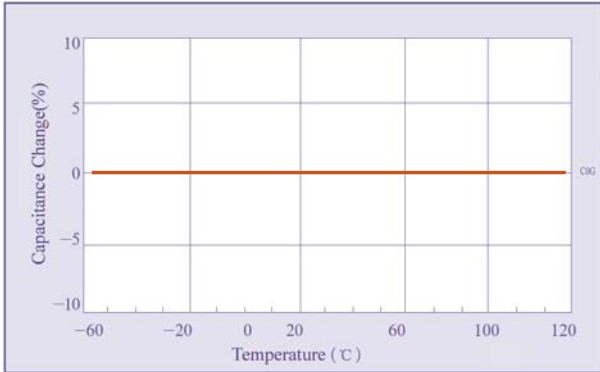
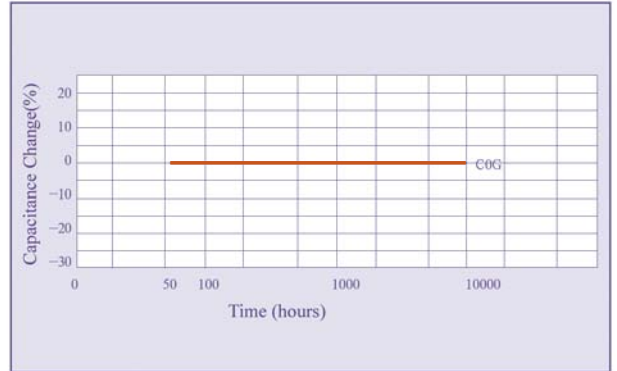
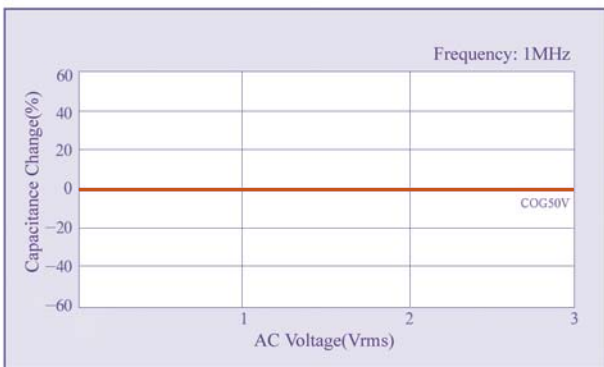
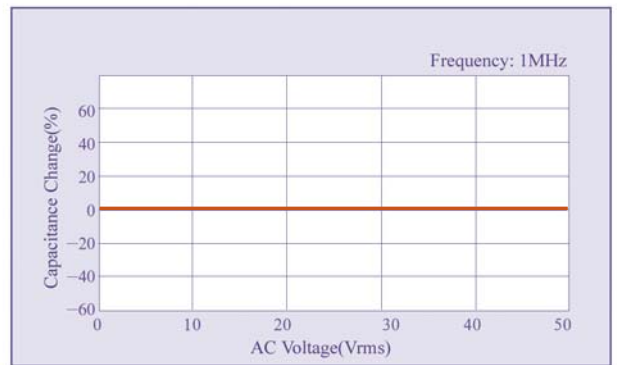
Code	Tolerance	Capacitance Range
B	$\pm 0.1\text{pF}$	< 10pF
C	$\pm 0.25\text{pF}$	
D	$\pm 0.5\text{pF}$	
F	$\pm 1\%$	$\geq 10\text{pF}$
G	$\pm 2\%$	
J	$\pm 5\%$	

⑦ Termination Type


Code	Termination Type
P	Non-magnetic Copper Plated 100% Sn(RoHS)

◆ Rated Capacitance Range Table (Unit:pF)

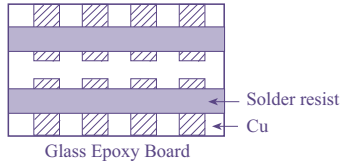
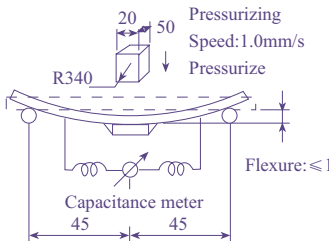
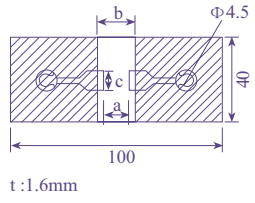
T.C.	Dimensions	Volt.	Capacitance Range (pF)		
			0.1	100	1000
CG	0603	50V	0.1	100	
	0805	50V	0.2	220	
	0805	100V	0.2	100	
	1206	50V	0.5	470	
	1206	100V	0.5	1000	

◆ Characteristics Curve
Capacitance vs Temperature

Capacitance Change vs Aging

Capacitance Change vs AC Voltage

Capacitance Change vs DC Voltage


◆ Specifications and Test Methods

No.	Item	Specification	Test Method												
1	Operating Temperature Range	-55℃ ~ +125℃													
2	Rated Voltage	See the previous pages	The rated voltage means the maximum direct voltage or peak value of pulse voltage which may be applied continuously to a capacitor.												
3	Appearance	No defects or abnormality	Visual inspection												
4	Dimensions	See the previous pages	Callipers inspection												
5	Dielectric Strength	No defects or abnormality	No failure shall be observed when 250% of the rated voltage is applied between the terminations for 1 to 5 seconds, provided the charge/discharge current is less than 50mA.												
6	Insulation Resistance	More than 1000000MΩ	The insulation resistance shall be measured with the rated voltage at 25℃, 75%RH and within 1 minute of charging.												
7	Capacitance	Within the specified tolerance	The capacitance/Q shall be measured at 25℃ with the frequency and voltage shown in the table.												
8	Q	Q is not less than 1000													
		<table border="1"> <thead> <tr> <th>Frequency</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td>1 ± 0.1MHz</td> <td>1 ± 0.2Vrms</td> </tr> </tbody> </table>		Frequency	Voltage	1 ± 0.1MHz	1 ± 0.2Vrms								
Frequency	Voltage														
1 ± 0.1MHz	1 ± 0.2Vrms														
9	Temperature Coefficient	See the previous pages capacitance drift: Within 0.3% or 0.05pF (whichever is large)	<p>The temperature cycling sequential is from step 1 through 5, The temperature coefficient shall be within the specified tolerance for the temperature coefficient. The temperature coefficient equal $[(C_i - C_3)/C_3]/(T_i - T_3)$. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in the step 1, 3 and 5 by the capacitance value in step 3.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>25 ± 2℃</td> </tr> <tr> <td>2</td> <td>- 55 ± 3℃</td> </tr> <tr> <td>3</td> <td>25 ± 2℃</td> </tr> <tr> <td>4</td> <td>125 ± 3℃</td> </tr> <tr> <td>5</td> <td>25 ± 2℃</td> </tr> </tbody> </table>	Step	Temperature	1	25 ± 2℃	2	- 55 ± 3℃	3	25 ± 2℃	4	125 ± 3℃	5	25 ± 2℃
Step	Temperature														
1	25 ± 2℃														
2	- 55 ± 3℃														
3	25 ± 2℃														
4	125 ± 3℃														
5	25 ± 2℃														
10	Adhesive Strength of Termination	No removal of the terminations or other defect shall occur	<p>Solder a capacitor to test jig (glass epoxy board) shown in below fig using a eutectic solder, then apply 10N force in the direction of the arrow. The soldering should be done either by hand iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.</p> 												

◆ Specifications and Test Methods

No.	Item	Specification	Test Method																
11	Appearance	No defect or abnormality	Solder the capacitor to test jig (glass epoxy board) shown in below fig. Soldering should be done either by hand iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock. The capacitor shall be subjected to a simple harmonic motion having a total amplitude of 1.5mm, The frequency being varied uniformly between the approximate limits of 10 and 55Hz. The frequency range, from 10 to 55Hz and return to 10Hz, shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total 6 hours)																
	Capacitance	Within the specified tolerance																	
	Q	$Q \geq 1000$																	
	Vibration Resistance																		
12	Deflection	No cracking or marking defects shall occur, $\Delta C/C < 10\%$	Solder the capacitor to the glass epoxy boards shown in below fig. Then apply a force in the direction and measured the capacitance.																
			 <table border="1" data-bbox="1181 1227 1428 1366"> <thead> <tr> <th>Size</th> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>1.0</td> <td>3.0</td> <td>1.2</td> </tr> <tr> <td>0805</td> <td>1.2</td> <td>4.0</td> <td>1.65</td> </tr> <tr> <td>1206</td> <td>2.2</td> <td>5.0</td> <td>2.0</td> </tr> </tbody> </table>	Size	a	b	c	0603	1.0	3.0	1.2	0805	1.2	4.0	1.65	1206	2.2	5.0	2.0
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0805	1.2	4.0	1.65																
1206	2.2	5.0	2.0																
13	Solderability of Termination	More than 75% of the terminations is to be soldered evenly and continuously.	Immerse the capacitor first in a ethanol solution of rosin, Preheat at 80°C to 120°C for 10 to 30 seconds. After preheating, immerse in eutectic solder solution for 2 ± 0.5 seconds at $230 \pm 5^\circ\text{C}$.																
14	Appearance	No marking defects	Preheat capacitor at 120°C to 200°C for 1 minutes, Then immerse the capacitor in a eutectic solder at 260°C to 265°C for 10 ± 1 seconds, the immersed depth is 10mm. Set it for 24 ± 2 hours at room.																
	Capacitance Range	Less than $\pm 2.5\%$ or $\pm 0.25\text{pF}$ (Whichever is larger)																	
	Q	$Q \geq 1000$																	
	Insulation Resistance	More than 100000M																	
	Resistance to Soldering Heat																		

◆ Specifications and Test Methods

No.	Item	Specification	Test Method															
15	Temperature Cycle	Appearance	Fix the capacitor to the supporting jig in the same manner and under the same conditions as (11). Perform the five cycles according to the four heat treatments listed in the following table. Set it for 24 ± 2 hours at room temperature.															
		Capacitance Range		Less than $\pm 1\%$ or $\pm 0.25\text{pF}$ (Whichever is larger)														
		Q		$Q \geq 1000$														
		Insulation Resistance		More than $100000\text{M}\Omega$														
			<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature($^{\circ}\text{C}$)</th> <th>Time(minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min.operating temp. -3 to 0</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>2 to 3</td> </tr> <tr> <td>3</td> <td>Max.operating temp. -3 to 0</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>2 to 3</td> </tr> </tbody> </table>	Step	Temperature($^{\circ}\text{C}$)	Time(minutes)	1	Min.operating temp. -3 to 0	30 ± 3	2	Room temperature	2 to 3	3	Max.operating temp. -3 to 0	30 ± 3	4	Room temperature	2 to 3
Step	Temperature($^{\circ}\text{C}$)	Time(minutes)																
1	Min.operating temp. -3 to 0	30 ± 3																
2	Room temperature	2 to 3																
3	Max.operating temp. -3 to 0	30 ± 3																
4	Room temperature	2 to 3																
16	Humidity Steady State	Appearance	Sit the capacitor at $40 \pm 2^{\circ}\text{C}$ and 90% to 95% humidity for 500 ± 12 hours. Remove and let sit for 24 ± 2 hours at room temperature, then measure.															
		Capacitance Range		Less than $\pm 5\%$ or $\pm 0.5\text{pF}$ (Whichever is larger)														
		Q		$Q \geq 1000$														
		Insulation Resistance		More than $100000\text{M}\Omega$														
17	Humidity Load	Appearance	Apply the rated voltage at $40 \pm 2^{\circ}\text{C}$ and 90% to 95% humidity for 500 ± 12 hours. Remove and let sit for 24 ± 2 hours at room temperature, then measure. The charge/discharge current is less than 50mA.															
		Capacitance Range		Less than $\pm 5\%$ or $\pm 0.5\text{pF}$ (Whichever is larger)														
		Q		$Q \geq 1000$														
		Insulation Resistance		More than $100000\text{M}\Omega$														
18	High Temperature Load	Appearance	Apply a voltage of 150% of the rated voltage for 1000 ± 12 hours at $125 \pm 3^{\circ}\text{C}$, and set it for 24 ± 2 hours at room temperature, then measure. The charge/discharge current is less than 50mA.															
		Capacitance Range		Less than $\pm 2.5\%$ or $\pm 0.25\text{pF}$ (Whichever is larger)														
		Q		$Q \geq 1000$														
		Insulation Resistance		More than $100000\text{M}\Omega$														