EIA NPO Dielectric Non-Magnetic Multilayer Ceramic Capacitors

Product Features

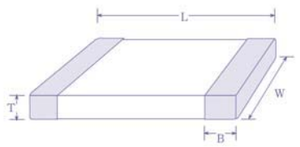
Non-Magnetic, Suitable for MRT

Part Numbering

C	0603	CG	101	A	500	P	T
1	2	3	4	5	6	7	8
Chip Capacitor	Dimensions	Temperature Coefficient	Rated Capacitance	Tolerance	Rated Voltage	Termination Type	Packing Type

Chip Capacitor

%Dimensions



Type	Dimensions (Unit: mm)				
		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

.Temperature Coefficient

Code(ETA)	Temperature Coefficients	Operating Temperature Range
CG(C0G)	0±30ppm1	-55°C +125°C

Rated Capacitance

Code	Capacitance
1R5	1.5pF
101	100pF

Rated voltage

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

Packing Type

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

Tolerance

Code	Tolerance	Capacitance Range
B	±0.1pF	810pF
C	±0.25pF	
D	±0.5pF	
F	±1%	910pF
G	±2%	
J	±5%	

Termination Type

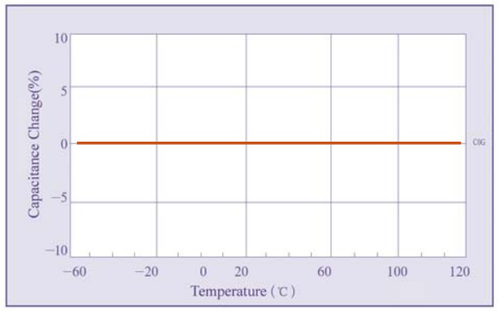
Code	Termination Type
P	Non-magnetic Copper Plated 100% Sn (RoHS)

Rated Capacitance Range Table (Unit: pF)

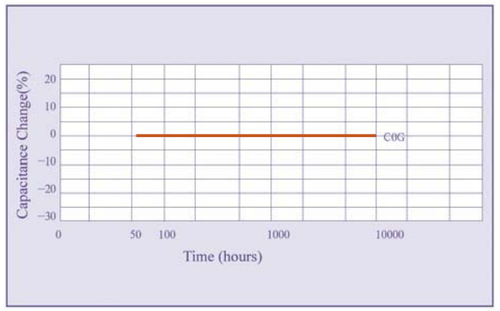
T.C.	Dimensions	Volt.	Capacitance Range (pF) 0.1 100 200 220
CG	0603	50V	0.1 – 100
	0805	50V	0.2 – 220
	0805	100V	0.2 – 100

Characteristics Curve

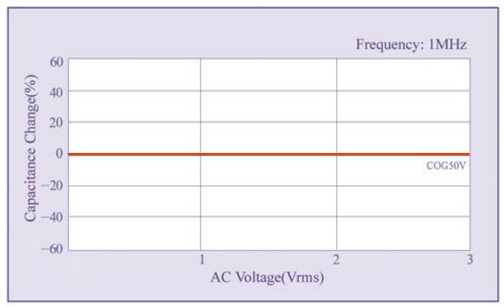
Capacitance vs Temperature



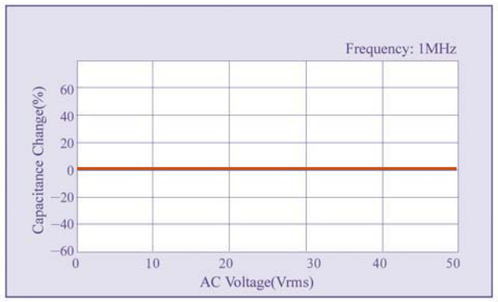
Capacitance Change vs Aging



Capacitance Change vs AC Voltage



Capacitance Change vs DC Voltage



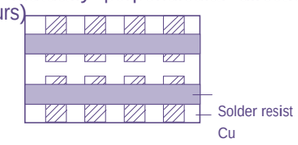
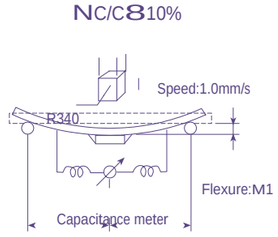
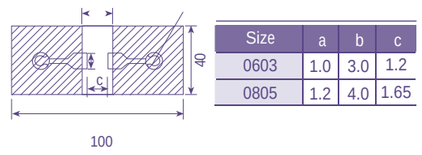
Specifications and Test Methods

No.	Item	Specification	Test Method
1	Operating Temperature Range	−55℃ ~ +125℃	
>	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.
?	Appearance	No defects or abnormality	Visual inspection
@	Dimensions	See the previous pages	Callipers inspection
A	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.
B	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.
C	Capacitance	Within the specified tolerance	The capacitance/Q shall be measured at 25℃ with the frequency and voltage shown in the table.
D	Q	Q is not less than 1000	(same as above)
E	Temperature Coefficient	See the previous pages capacitance drift: Within 0.3% or 0.05pF (whichever is large)	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 I(Ci C3)/C3J/(Ti T3).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.
10	Adhesive Strength of Termination	No removal of the terminations or other defect shall occur	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.

Frequency	Voltage
1±0.1MHz	1±0.2Vrms

Step	Temperature
1	25±2℃
2	55±3℃
3	25±2℃
	125±3℃
5	25±2℃

Specifications and Test Methods

No.	Item		Specification	Test Method
11	Vibration Resistance	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 of 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)  Glass Epoxy Board
		Capacitance	Within the specified tolerance	
		Q	Q≥1000	
			No cracking or marking defects shall occur, ΔC/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.  Size / a / b / c 0603 / 1.0 / 3.0 / 1.2 0805 / 1.2 / 4.0 / 1.65
13	Solderability of Termination		More than 75% of the terminations is to be soldered evenly and continuously.	Immerse the capacitor first in an ethanol solution of rosin, Preheat at 80℃ to 120℃ for 10 to 30 seconds. After preheating, immerse in eutectic solder solution for 2±0.5 seconds at 230±5℃.
14	Resistance to Soldering Heat	Appearance	No marking defects	Preheat capacitor at 120℃ to 200℃ for 1 minutes, Then immerse the capacitor in an eutectic solder at 260℃ to 265℃ for 10±1 seconds, the immersed depth is 10mm. Set it for 24±2 hours at room.
		Capacitance Range	Less than ±2.5% or ±0.25pF (Whichever is larger)	
		Q	Q≥1000	
		Insulation Resistance	More than 100000MΩ	

Specifications and Test Methods

No.	Item		Specification	Test Method
15	Temperature Cycle	Appearance	No marking defects	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. Step / Temperature(℃) / 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
		Capacitance Range	Less than ±1% or ±0.25pF (Whichever is larger)	
		Q	Q≥1000	
		Insulation Resistance	More than 100000MΩ	
16	Humidity Steady State	Appearance	No marking defects	Sit the capacitor at 40±2℃ 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 ±5% or ±0.5pF (Whichever is larger)	
		Q	Q≥1000	
		Resistance		
17	Humidity Load	Appearance	No marking defects	Apply the rated voltage at 40±2℃ and 90% to 95% humidity for 500±12 hours. temperature, then measure. The charge/discharge current is less than 50mA.
		Capacitance Range	Less than ±5% or ±0.5pF (Whichever is larger)	
		Q	Q≥1000	
		Insulation Resistance	More than 100000MΩ	
18	High Temperature Load	Appearance	No marking defects	Apply a voltage of 150% of the rated voltage for 1000±12 hours at 125±3℃ ,and set it for 24±2 hours at room temperature, then measure. The charge/discharge current is less than 50mA.
		Capacitance Range	Less than ±2.5% or ±0.25pF (Whichever is larger)	
		Q	Q≥1000	
		Insulation Resistance	More than 100000MΩ	

EIA X7R Dielectric Non-Magnetic Multilayer Ceramic Capacitors

Product Features

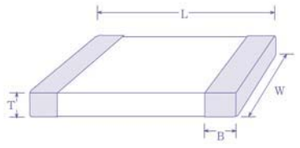
Non-Magnetic, Suitable for MRI

Part Numbering

C	0603	X	222	K	500	P	T
1	2	3	4	5	6	7	8
Chip Capacitor	Dimensions	Temperature Characteristic	Rated Capacitance	Tolerance	Rated Voltage	Termination Type	Packing Type

Chip Capacitor

%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

.Temperature Characteristics

Code(EIA)	Temperature Characteristics	Operating Temperature Range
X(X7R)	±15%	/55° 0125°

Rated Capacitance

Code	Capacitance
102	1000pF
222	2200pF

Tolerance

Code	Tolerance
J	±5%
K	±10%
M	±20%

Rated voltage

Code	Rated Voltage(DC)
501	500V

Termination Type

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

Packing Type

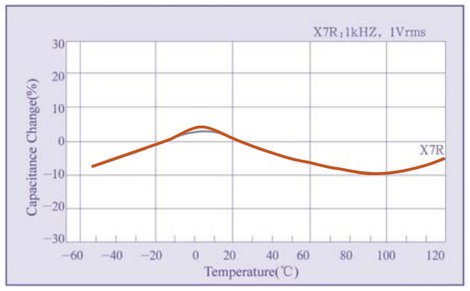
Code	Packing Type
T	Tape carrier packing
B	Bulk packing in a bag

Rated Capacitance Range Table (Unit: pF)

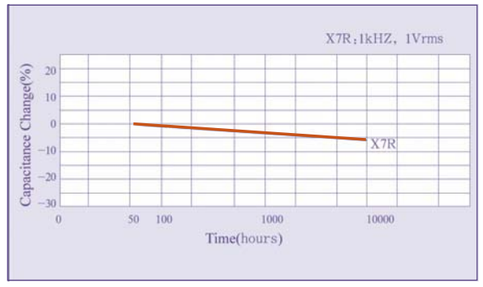
Dimensions	Volt.	Capacitance Range (pF) 0.5	10	100	1000	10000	100000
0603	50V			1000	4700		
0805	50V			1000		22000	

Characteristics Curve

Capacitance vs Temperature



Capacitance Change vs Aging



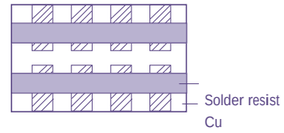
Specifications and Test Methods

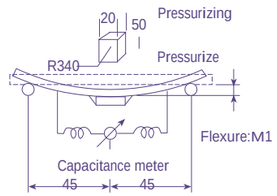
No.	Item	Specification	Test Method
1	Operating Temperature Range	−55° ~ +125°	
2	Rated Voltage	50V	The rated voltage means the maximum direct voltage or peak value of pulse voltage which may be applied continuously to a capacitor.
3	Appearance	No defects or abnormality	Visual inspection
4	Dimensions	See the previous pages	Callipers inspection
5	Dielectric Strength	No defect or abnormality	No failure shall be observed when the given coefficient 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 100000MΩ	The insulation resistance shall be measured with the testing voltage at normal temperature and humidity and within 2 minute of charging.
7	Capacitance	Within the specified tolerance	The capacitance Q/D.F. shall be measured at 25° with the frequency and voltage shown in the table.
8	D.F. Dissipation Factor	D.F 2.5%	
E	Temperature Characteristics	15%	Refer to the test methods of general ceramic chip capacitors.
10	Adhesive Strength of Termination	No removal of the terminations or other defect shall occur	Solder a capacitor to test jig (glass epoxy board) shown in below fig using an 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.

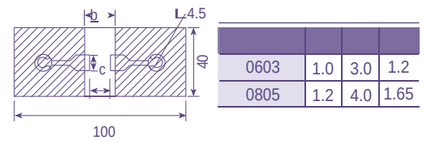
	Frequency	Voltage
X7R	1±0.1KHz	1±0.2Vrms

Specifications and Test Methods

No.	Item		Specification	Test Method
11	Vibration Resistance	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 of 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	
		D.F.	D.F 2.5%	
12	Deflection		No cracking or marking defects shall occur, $\Delta C/C$ 10%	Solder the capacitor to test jig (glass epoxy board) shown in below fig. Then apply a force in the direction shown in below fig.
13	Solderability of Termination		More than 75% of the terminations is to be soldered evenly and continuously.	Immerse the capacitor first in an ethanol solution of rosin, Preheat at 80° to 120° for 10 to 30 seconds. After preheating, immerse in eutectic solder solution for 2±0.5 seconds at 230±5°.
14	Resistance to Soldering Heat	Appearance	No marking defects	Preheat capacitor at 120° to 200° for 1 minutes, Then immerse the capacitor in a eutectic solder at 260° to 265° for 10±1 seconds, Set it for 24±2 hours at room temperature, then measure.
		Capacitance Range	10%	
		D.F	D.F 2.5%	
		Insulation Resistance	I.R: More than 10000 meg ohms	







0603	1.0	3.0	1.2
0805	1.2	4.0	1.65

Specifications and Test Methods

No.	Item		Specification	Test Method
15	Temperature Cycle	Appearance	No marking defects	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	10%	
		D.F	D.F 2.5%	
		Insulation Resistance	More than 10000 meg ohms	
16	Humidity Steady State	Appearance	No defect or abnormality	Sit the capacitor at 40±2℃ and 90% to 95% humidity for 500±12 hours. Remove and let sit for 48±2 hours at room temperature, then measure.
		Capacitance Range	10%	
		D.F	D.F 2.5%	
		Insulation Resistance	More than 1000 meg ohms	
17	High Temperature Load	Appearance	No marking defects	Apply a DC voltage of 150% of the rated voltage for 1000 hours at the maximum operating temperature, and set it for 48 hours at room temperature, then measure. The charge/discharge current is less than 50mA.
		Capacitance Range	10%	
		D.F	D.F 2.5%	
		Insulation Resistance	More than 1000 meg ohms	

Step	Temperature(℃)	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

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