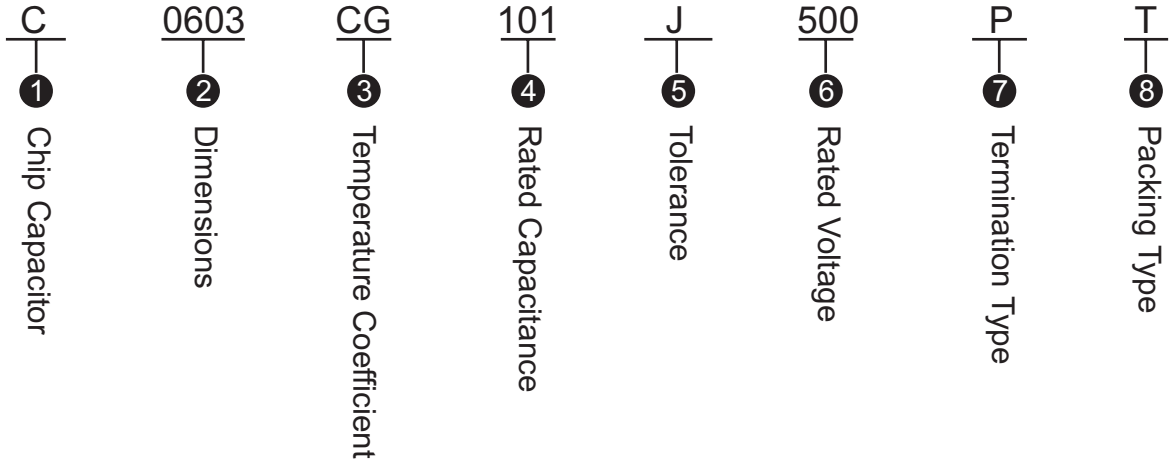
General Purpose Non-Magnetic Multilayer Ceramic Capacitors

◆Product Features

Non-Magnetic, Suitable for MRI

◆Part Numbering



①**C:** General Purpose Non-Magnetic Multilayer Ceramic Capacitors

②Dimensions

Series	L	W	T	B(Min)	B(Max)
0603	1.60±0.10	0.80±0.10	0.80±0.10	0.20	0.50
0805	2.00±.020	1.20±.020	1.40	0.25	0.60
1206	3.20±.020	1.60±.020	1.40	0.25	0.60
1210	3.20±.020	2.50±.020	2.00	0.25	0.70

③Temperature Coefficient

CG: 0±30ppm/℃
X: ±15%

④Rated Capacitance

Capacitance is less than 10pF; for example: 1R0=1.0pF, R denote decimal point.

Capacitance greater than 10pF; for example: 101=100pF, the third number is the power of 10.

⑤Tolerance

Code	B	C	D	G	J	K
Tolerance	±0.1pF	±0.25pF	±0.5pF	±2%	±5%	±10%

⑥ Rated Voltage

Code	Rated Voltage(V)	Code	Rated Voltage(V)
250	25	251	250
500	50	501	500
101	100	102	1000
201	200	202	2000

⑦ Laser Marking

P: 100% Sn Solder over Copper Plating (RoHS Compliant)

⑧ Packaging Type

T: Tape carrier packing

	A0 (mm)	B0 (mm)	K0 (mm)	W (mm)	P0 (mm)	P1 (mm)	T (mm)	F (mm)	Qty/min	Qty/reel	Tape Material
0603	1.05	1.80	0.90	8.00	4.00	4.00	0.90	3.50	1000	4000	Paper
0805	1.40	2.20	1.20	8.00	4.00	4.00	0.22	3.50	1000	3000	Plastic
1206	1.91	3.51	1.30	8.00	4.00	4.00	0.25	3.50	1000	3000	Plastic
1210	2.85	3.50	1.95	8.00	4.00	4.00	0.25	3.50	1000	3000	Plastic

◆Capacitance & Rated Voltage Table

unit: V

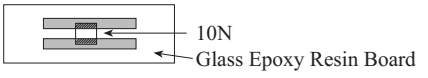
CG	0603					0805				1206					1210					
Code.	25	50	100	200	250	50	100	200	250	50	100	200	250	500	50	100	200	250	500	1000
1R0																				
1R2																				
1R5																				
1R8																				
2R2																				
2R7																				
3R3																				
3R9																				
4R7																				
5R6																				
6R8																				
8R2																				
100																				
120																				
150																				
180																				
220																				
270																				
330																				
390																				
470																				
560																				
680																				
820																				
101																				
121																				
151																				
181																				
221																				
271																				
331																				
391																				
471																				
561																				
681																				
821																				
102																				

◆Capacitance & Rated Voltage Table

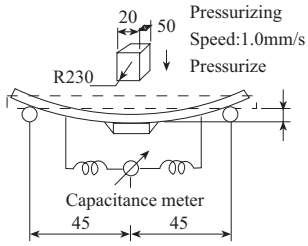
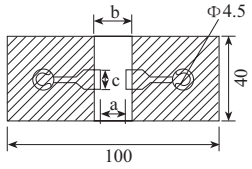
unit: V

X7R	0603					0805				1206					1210					
Code.	25	50	100	200	250	50	100	200	250	50	100	200	250	500	50	100	200	250	500	1000
331																				
471																				
681																				
821																				
102																				
152																				
222																				
332																				
472																				
682																				
103																				
153																				
223																				
333																				
473																				
683																				
104																				
154																				
224																				
334																				
474																				
684																				
105																				

◆Specifications and Test Methods

<table>
<tr><th>No.</th><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>1</td><td>Operating Temperature Range</td><td>−55℃～+125℃</td><td></td></tr>
<tr><td>2</td><td>Appearance</td><td>No defects or abnormality</td><td>Visual inspection</td></tr>
<tr><td>3</td><td>Dimensions</td><td>See the previous pages</td><td>Callipers inspection</td></tr>
<tr><td>4</td><td>Dielectric Strength</td><td>No defects or abnormality</td><td>2.5 RV for 5 seconds, RV ⩽500VDC;
1.5 RV for 5 seconds, 500VDC ＜ RV ⩽1250V DC;
1.2 RV for 5 seconds, RV ＞1250VDC;
RV-Rated Voltage.</td></tr>
<tr><td>5</td><td>Insulation Resistance</td><td>More than 10GΩ or 100MΩ · μF, Whichever is less.</td><td>The insulation resistance shall be measured with the rated voltage at 25℃, 75%RH and within 1 minute of charging.</td></tr>
<tr><td>6</td><td>Capacitance</td><td>Within the specified tolerance</td><td rowspan="2">The capacitance/Q shall be measured at 25℃ with the frequency and voltage shown in the table.
<table>
<tr><th></th><th>Frequency</th><th>Voltage</th></tr>
<tr><td>NP0</td><td>1±0.1MHz</td><td>1±0.2Vrms</td></tr>
<tr><td>X7R</td><td>1±0.1KHz</td><td>1±0.2Vrms</td></tr>
</table></td></tr>
<tr><td>7</td><td>Dissipation Factor /Q</td><td>NP0:
Cap⩾30pF, Q⩾1000;
Cap＜30pF, Q⩾400+20C
X7R:
D.F⩽ 5%</td></tr>
<tr><td>8</td><td>Temperature Coefficient</td><td>NP0: 0±30ppm/℃
X7R: ±15%</td><td>The temperature cycling sequential is from the step 1 through 5. The temperature coefficient shall be within the specified tolerance for the temperature coefficient.
<table>
<tr><th>Step</th><th>Temperature(℃)</th></tr>
<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>
</table></td></tr>
<tr><td>9</td><td>Adhesive strength of termination</td><td>No removal of the terminations or other defect shall occur</td><td>Solder a capacitor to test jig (glass epoxy board) shown in fig below 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.
 
</td></tr>
</table>

◆Specifications and Test Methods

No.	Item		Specification	Test Method
10	Deflection		No cracking or marking defects shall occur, △C/C＜5% 	Solder the capacitor to the glass epoxy boards shown in below fig. Then apply a force in the direction and measured the capacitance.  t :1.6mm
11	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 250±5℃.
12	Resistance to Soldering Heat	Appearance	No marking defects.	Preheat capacitor at 120℃ to 200℃ for 1 minute. Then immerse the capacitor in a eutectic solder at 260℃ to 265℃ for 10±1 second, the immersed depth is 10mm. Set it for 24±2 hours at room.
		Capacitance Range	NP0: Less than ±2.5% or ±0.25pF (Whichever is larger) X7R: Less than ±7.5% .	
		D.F./Q	NP0: Cap≥30pF, Q≥1000; Cap<30pF, Q≥400+20C X7R: D.F≤ 5%	
		Insulation Resistance	More than 10GΩ or 100MΩ · μF, Whichever is less.	

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

◆Specifications and Test Methods

<table>
<tr><th>No.</th><th colspan="2">Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td rowspan="4">13</td><td rowspan="4">Temperature Cycle</td><td>Appearance</td><td>No marking defects.</td><td rowspan="4">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.
<table><tr><th>Step</th><th>Temperature(℃)</th><th>Time(minutes)</th></tr><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></table></td></tr>
<tr><td>Capacitance Range</td><td>NP0:
Less than ±2.5% or ±0.25pF (Whichever is larger)
X7R:
Less than ±7.5% .</td></tr>
<tr><td>D.F./Q</td><td>NP0:
Cap≥30pF, Q≥1000;
Cap<30pF, Q≥400+20C
X7R:
D.F≤ 5%</td></tr>
<tr><td>Insulation Resistance</td><td>More than 10GΩ or 100MΩ · μF, Whichever is less.</td></tr>
<tr><td rowspan="4">14</td><td rowspan="4">Humidity Steady State</td><td>Appearance</td><td>No marking defects.</td><td rowspan="4">Set 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.</td></tr>
<tr><td>Capacitance Range</td><td>NP0:
Less than ±5% or ±0.5pF (Whichever is larger)
X7R:
Less than ±12.5% .</td></tr>
<tr><td>D.F./Q</td><td>NP0:
Cap≥30pF, Q≥1000;
Cap<30pF, Q≥400+20C
X7R:
D.F≤ 5%</td></tr>
<tr><td>Insulation Resistance</td><td>More than 1GΩ or 10MΩ · μF, Whichever is less.</td></tr>
<tr><td rowspan="4">15</td><td rowspan="4">High Temperature Load</td><td>Appearance</td><td>No marking defects.</td><td rowspan="4">Apply a voltage for 1000±12 hours at 125±3℃, and set it for 24±2 hours at room temperature, then easure.
The charge/discharge current is less than 50mA.
Apply voltage:
<500V, apply 200% rated voltage;
500V, apply 150% rated voltage;
>500V, apply 120% rated voltage;</td></tr>
<tr><td>Capacitance Range</td><td>NP0:
Less than ±5% or ±0.5pF (Whichever is larger)
X7R:
Less than ±12.5% .</td></tr>
<tr><td>D.F./Q</td><td>NP0:
Cap≥30pF, Q≥1000;
Cap<30pF, Q≥400+20C
X7R:
D.F≤ 5%</td></tr>
<tr><td>Insulation Resistance</td><td>More than 1GΩ or 10MΩ · μF, Whichever is less.</td></tr>
</table>