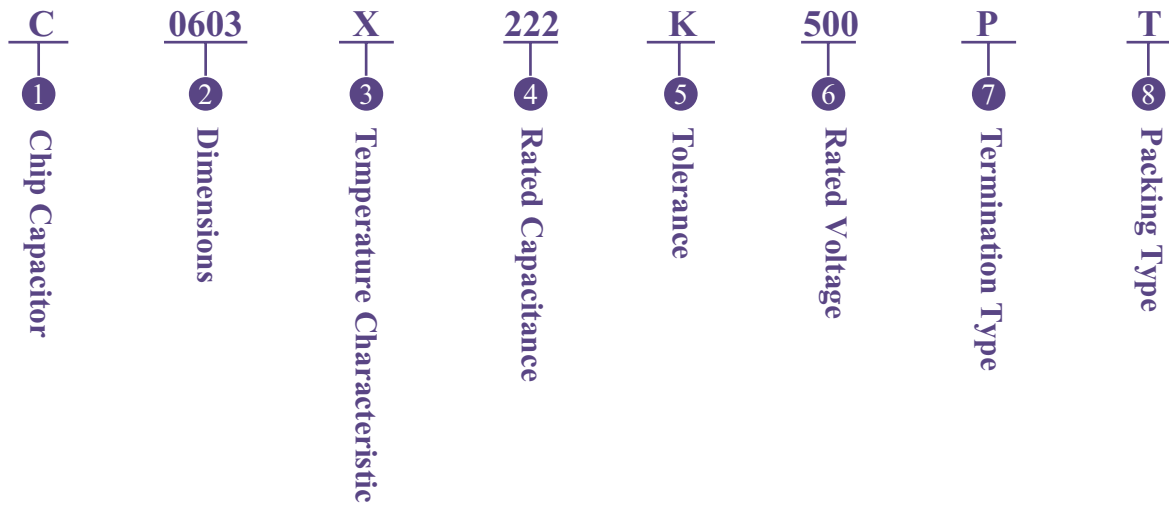


X7R Dielectric Non-Magnetism Multilayer Ceramic Capacitors

◆Product Features

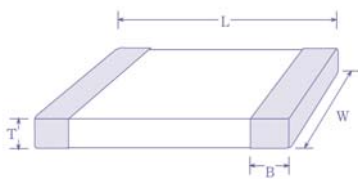
Non-Magnetism, Suitable for MRI

◆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

③ Temperature Characteristics

Code(EIA)	Temperature Characteristics	Operating Temperature Range
X(X7R)	± 15%	-55°C ~ +125°C

④ Rated Capacitance

Code	Capacitance
102	1000pF
222	2200pF

⑥ Rated voltage

Code	Rated Voltage(DC)
501	500V

⑧ Packing Type

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

⑤ Tolerance

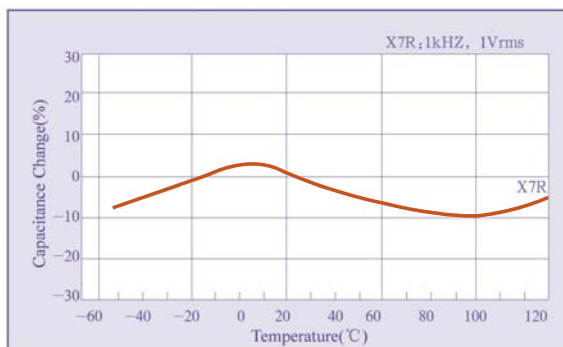
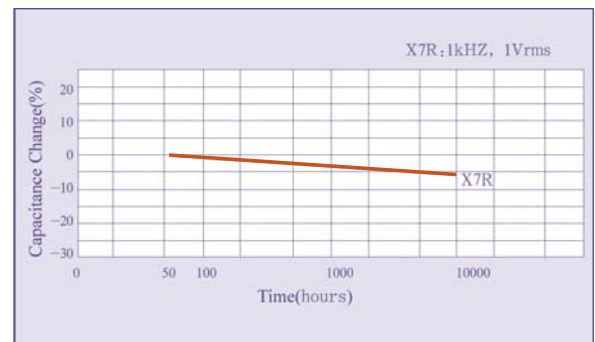
Code	Tolerance
J	± 5%
K	± 10%
M	± 20%

⑦ Termination Type


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

◆ Rated Capacitance Range Table (Unit:pF)

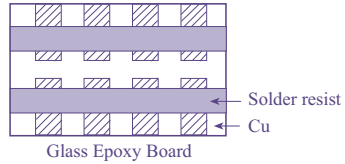
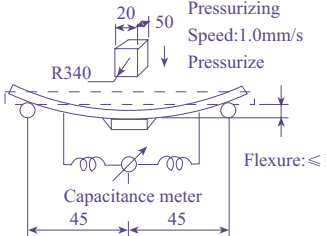
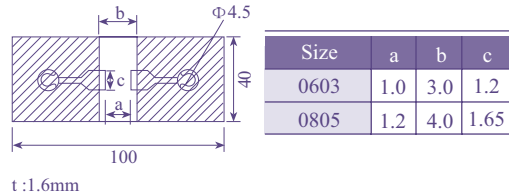
Dimensions	Volt.	Capacitance Range (pF)					
		0.5	10	100	1000	10000	100000
0603	50V			1000	4700		
0805	50V			1000	22000		

◆ Characteristics Curve
Capacitance vs Temperature

Capacitance Change vs Aging


◆ Specifications and Test Methods

No.	Item	Specification	Test Method						
1	Operating Temperature Range	-55°C ~ +125°C							
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°C with the frequency and voltage shown in the table.						
8	D.F. Dissipation Factor	D.F. ≤ 2.5%							
			<table border="1"> <thead> <tr> <th></th> <th>Frequency</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td>X7R</td> <td>1 ± 0.1KHz</td> <td>1 ± 0.2Vrms</td> </tr> </tbody> </table>		Frequency	Voltage	X7R	1 ± 0.1KHz	1 ± 0.2Vrms
	Frequency	Voltage							
X7R	1 ± 0.1KHz	1 ± 0.2Vrms							
9	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	<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													
	Vibration Resistance	D.F.		$D.F \leq 2.5\%$											
															
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.												
			 <table border="1" style="display: inline-table; vertical-align: top;"> <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> </tbody> </table>	Size	a	b	c	0603	1.0	3.0	1.2	0805	1.2	4.0	1.65
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 a 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 $230 \pm 5^\circ\text{C}$.												
14	Resistance to Soldering Heat	Appearance	No marking defects												
		Capacitance Range	$\leq \pm 10\%$												
		D.F	$D.F \leq 2.5\%$												
		Insulation Resistance	I.R: More than 10000 megohms												
			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.												

◆ Specifications and Test Methods

No.	Item	Specification	Test Method															
15	Temperature Cycle	Appearance	No marking defects															
		Capacitance Range	$\leq \pm 10\%$															
		D.F	$D.F \leq 2.5\%$															
		Insulation Resistance	More than 10000 megohms															
			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 border="1"> <thead> <tr> <th>Step</th> <th>Temperature(°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(°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(°C)	Time(minutes)																
1	Min.operating temp. -3 to 0	30 ± 3																
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3	Max.operating temp. -3 to 0	30 ± 3																
4	Room temperature	2 to 3																
16	Humidity Steady State	Appearance	No defect or abnormality															
		Capacitance Range	$\leq \pm 10\%$															
		D.F	$D.F \leq 2.5\%$															
		Insulation Resistance	More than 1000 megohms															
			Sit the capacitor at $40 \pm 2^\circ\text{C}$ and 90% to 95% humidity for 500 ± 12 hours. Remove and let sit for 48 ± 2 hours at room temperature, then measure.															
17	High Temperature Load	Appearance	No marking defects															
		Capacitance Range	$\leq \pm 10\%$															
		D.F	$D.F \leq 2.5\%$															
		Insulation Resistance	More than 1000 megohms															
			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.															