

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N: **CL05B104KO5NNNO**
- Description : **CAP, 100nF, 16V, ± 10%, X7R, 0402**

## A. Samsung Part Number

CL   05   B   104   K   O   5   N   N   N   O  
①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

<b>① Series</b>	Samsung Multi-layer Ceramic Capacitor		
<b>② Size</b>	0402 (inch code)	L: 1.00 ±0.05mm	W: 0.50 ±0.05mm
<b>③ Dielectric</b>	X7R	<b>⑧ Inner electrode</b>	Ni
<b>④ Capacitance</b>	100 nF	<b>Termination</b>	Cu
<b>⑤ Capacitance tolerance</b>	± 10 %	<b>Plating</b>	Sn 100% (Pb Free)
<b>⑥ Rated Voltage</b>	16 V	<b>⑨ Product</b>	Normal
<b>⑦ Thickness</b>	0.50 ±0.05mm	<b>⑩ Special</b>	Reserved for future use
		<b>⑪ Packaging</b>	Cardboard Type, 10" reel

## B. Samsung Reliability Test and Judgement condition

	Judgement	Test condition
<b>Capacitance</b>	Within specified tolerance	1kHz±10%      1.0±0.2Vrms
<b>Tan δ (DF)</b>	0.05 max.	
<b>Insulation Resistance</b>	10,000Mohm or 100Mohm·μF Whichever is Smaller	Rated Voltage      60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscope (×10)
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	250% of the rated voltage
<b>Temperature Characteristics</b>	X7R (From -55℃ to 125℃, Capacitance change should be within ±15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g·F, for 10±1 sec.
<b>Bending Strength</b>	Capacitance change : within ±12.5%	Bending to the limit (1mm) with 1.0mm/sec.
<b>Solderability</b>	More than 75% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change : within ±7.5% Tan δ, IR : initial spec.	Solder pot : 270±5℃, 10±1sec.

	<b>Judgement</b>	<b>Test condition</b>
<b>Vibration Test</b>	Capacitance change : within $\pm 5\%$ Tan $\delta$ , IR : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours $\times$ 3 direction (x, y, z)
<b>Moisture Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ 0.075 max IR : 500Mohm or 25Mohm . $\mu F$ Whichever is Smaller	With rated voltage 40 $\pm$ 2 $^{\circ}C$ , 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ 0.075 max IR : 1000Mohm or 50Mohm . $\mu F$ Whichever is Smaller	With 200% of the rated voltage Max. operating temperature 1000+48/-0hrs
<b>Temperature Cycling</b>	Capacitance change : within $\pm 7.5\%$ Tan $\delta$ , IR : initial spec.	1 cycle condition Min. operating temperature $\rightarrow$ 25 $^{\circ}C$ $\rightarrow$ Max. operating temperature $\rightarrow$ 25 $^{\circ}C$  5 cycle test

**C. Recommended Soldering method :**

Reflow ( Reflow Peak Temperature : 260+0/-5 $^{\circ}C$ , 10sec. Max )

\* For the more detail Specification, Please refer to the Samsung MLCC catalogue.