

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N: **CL05A105KO5NNNC**
- Description : **CAP, 1 $\mu$ F, 16V,  $\pm$ 10%, X5R, 0402**

## A. Samsung Part Number

**CL 05 A 105 K O 5 N N N C**

<b>Series</b>	Samsung Multi-layer Ceramic Capacitor		
<b>Size</b>	0402 (inch code)	L: 1.0 $\pm$ 0.05 mm	W: 0.5 $\pm$ 0.05 mm
<b>Dielectric</b>	X5R	<b>Inner electrode</b>	Ni
<b>Capacitance</b>	1 $\mu$ F	<b>Termination</b>	Cu
<b>Capacitance tolerance</b>	$\pm$ 10 %	<b>Plating</b>	Sn 100% (Pb Free)
<b>Rated Voltage</b>	16 V	<b>Product</b>	Normal
<b>Thickness</b>	0.5 $\pm$ 0.05 mm	<b>Special</b>	Reserved for future use
		<b>Packaging</b>	Cardboard Type, 7" reel

## B. Samsung Reliability Test and Judgement condition

	Judgement	Test condition
<b>Capacitance</b>	Within specified tolerance	1kHz $\pm$ 10%      1.0 $\pm$ 0.2Vrms
<b>Tan <math>\delta</math> (DF)</b>	0.1 max.	
<b>Insulation Resistance</b>	10,000Mohm or 100Mohm $\cdot\mu$ F Whichever is Smaller	Rated Voltage      60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscope ( $\times$ 10)
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	250% of the rated voltage
<b>Temperature Characterisitcs</b>	X5R (From -55 to 85 , Capacitance change should be within $\pm$ 15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g $\cdot$ F, for 10 $\pm$ 1 sec.
<b>Bending Strength</b>	Capacitance change : within $\pm$ 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	1) Sn63Pb37 solder 235 $\pm$ 5 , 5 $\pm$ 0.5sec. 2) SnAg3.0Cu0.5 solder 245 $\pm$ 5 , 3 $\pm$ 0.3sec. (preheating : 80~120 for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change : within $\pm$ 7.5% Tan $\delta$ , IR : initial spec.	Solder pot : 270 $\pm$ 5 , 10 $\pm$ 1sec.

	Judgement	Test condition
<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 $\delta$ 0.2 max IR : 12.5M $\Omega$ $\cdot$ $\mu$ F or Over	With rated voltage 40 $\pm$ 2 , 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ 0.2 max IR : 25M $\Omega$ $\cdot$ $\mu$ F or Over	With 100% 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 25 Max. operating temperature 25  5 cycle test

**C. Recommended Soldering method :**

Reflow ( Reflow Peak Temperature : 260+0/-5 , 10sec. Max )

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