

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : **CL02A222KQ2NNNC**
- Description : **CAP, 2.2nF, 6.3V, ±10%, X5R, 01005**

## A. Samsung Part Number

CL 02 A 222 K Q 2 N N N C  
①    ②    ③    ④    ⑤    ⑥    ⑦    ⑧    ⑨    ⑩    ⑪

<b>① Series</b>	Samsung Multi-layer Ceramic Capacitor		
<b>② Size</b>	01005 (inch code)	L: 0.4 ± 0.02 mm	W: 0.2 ± 0.02 mm
<b>③ Dielectric</b>	X5R	<b>⑧ Inner electrode</b>	Ni
<b>④ Capacitance</b>	2.2 nF	<b>Termination</b>	Cu
<b>⑤ Capacitance tolerance</b>	±10 %	<b>Plating</b>	Sn 100% (Pb Free)
<b>⑥ Rated Voltage</b>	6.3 V	<b>⑨ Product</b>	Normal
<b>⑦ Thickness</b>	0.2 ± 0.02 mm	<b>⑩ Special</b>	Reserved for future use
		<b>⑪ Packaging</b>	Cardboard Type, 7" reel

## B. Samsung Reliability Test and Judgement condition

	Performance	Test condition
<b>Capacitance</b>	Within specified tolerance	1kHz±10%      1.0±0.2Vrms
<b>Tan δ (DF)</b>	0.1 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 (×20)
<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 ±15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	100g-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>Performance</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 $\delta$ : 0.125 max IR : 12.5M $\Omega \cdot \mu F$ or Over	With rated voltage 40 $\pm 2$ °C, 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.125 max IR : 25M $\Omega \cdot \mu F$ or Over	With 150% 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°C $\rightarrow$ Max. operating temperature $\rightarrow$ 25°C  5 cycle test

**C. Recommended Soldering method :**

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

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