

SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor

- Samsung P/N: **CL05A106MR5NRNC**
- Description : **CAP, 10 μ F, 4V, \pm 20%, X5R, 0402**

A. Samsung Part Number

CL 05 A 106 M R 5 N R N C
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Series	Samsung Multi-layer Ceramic Capacitor				
② Size	0402 (inch code)	L:	1.0 ± 0.15 mm	W:	0.5 ± 0.15 mm
③ Dielectric	X5R	⑧ Inner electrode	Ni		
④ Capacitance	10 μF	Termination	Cu		
⑤ Capacitance tolerance	±20 %	Plating	Sn 100% (Pb Free)		
⑥ Rated Voltage	4 V	⑨ Product	0402 Size dimension spec		
⑦ Thickness	0.5 ± 0.15 mm	⑩ Special	Reserved for future use		
		⑪ Packaging	Cardboard Type, 7" reel		

B. Samsung Reliability Test and Judgement condition

	Judgement	Test condition
Capacitance	Within specified tolerance	1kHz \pm 10% 0.5 \pm 0.1Vrms
Tan δ (DF)	0.125 max.	
Insulation Resistance	10,000Mohm or 50Mohm $\cdot\mu$ F Whichever is Smaller	Rated Voltage 60~120 sec.
Appearance	No abnormal exterior appearance	Microscope (\times 10)
Withstanding Voltage	No dielectric breakdown or mechanical breakdown	250% of the rated voltage
Temperature Characterisitcs	X5R (From -55 $^{\circ}$ C to 85 $^{\circ}$ C, Capacitance change should be within \pm 15%)	
Adhesive Strength of Termination	No peeling shall be occur on the terminal electrode	500g \cdot F, for 10 \pm 1 sec.
Bending Strength	Capacitance change : within \pm 12.5%	Bending to the limit (1mm) with 1.0mm/sec.
Solderability	More than 75% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder 245 \pm 5 $^{\circ}$ C, 3 \pm 0.3sec. (preheating : 80~120 $^{\circ}$ C for 10~30sec.)
Resistance to Soldering heat	Capacitance change : within \pm 7.5% Tan δ , IR : initial spec.	Solder pot : 270 \pm 5 $^{\circ}$ C, 10 \pm 1sec.

	Judgement	Test condition
Vibration Test	Capacitance change : within $\pm 5\%$ Tan δ , IR : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours \times 3 direction (x, y, z)
Moisture Resistance	Capacitance change : within $\pm 12.5\%$ Tan δ 0.25 max IR : 3.5M $\Omega \cdot \mu F$ or Over	With rated voltage 40 $\pm 2^\circ\text{C}$, 90~95%RH, 500+12/-0hrs
High Temperature Resistance	Capacitance change : within $\pm 12.5\%$ Tan δ 0.25 max IR : 7M $\Omega \cdot \mu F$ or Over	With 100% of the rated voltage Max. operating temperature 1000+48/-0hrs
Temperature Cycling	Capacitance change : within $\pm 15\%$ Tan δ , IR : initial spec.	1 cycle condition Min. operating temperature $\rightarrow 25^\circ\text{C}$ \rightarrow Max. operating temperature $\rightarrow 25^\circ\text{C}$ 5 cycle test

C. Recommended Soldering method :

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

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