



SPECIFICATION

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

- Samsung P/N : [CL31C221JHFNNNF](#)
- Description : CAP, 220pF, 630V, ±5%, C0G, 1206

A. Samsung Part Number

CL **31** **C** **221** **J** **H** **F** **N** **N** **N** **F**
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Series	Samsung Multi-layer Ceramic Capacitor													
② Size	1206 (inch code)			L: 3.2 ± 0.15 mm			W: 1.6 ± 0.15 mm							
③ Dielectric	C0G				⑧ Inner electrode	Ni								
④ Capacitance	220 pF				Termination	Cu								
⑤ Capacitance tolerance	±5 %				Plating	Sn 100% (Pb Free)								
⑥ Rated Voltage	630 V				⑨ Product	Normal								
⑦ Thickness	1.25 ± 0.15 mm				⑩ Special	Reserved for future use								
					⑪ Packaging	Embossed Type, 13" reel								

B. Samsung Reliability Test and Judgement condition

	Performance	Test condition
Capacitance	Within specified tolerance	1MHz±10% 0.5~5Vrms
Q	1000 min	
Insulation Resistance	10,000Mohm or 500Mohm·μF Whichever is Smaller	500±50 Vdc 60~120 sec.
Appearance	No abnormal exterior appearance	Microscope (×10)
Withstanding Voltage	No dielectric breakdown or mechanical breakdown	150% of the rated voltage
Temperature Characterisitcs	C0G (From -55 °C to 125 °C, Capacitance change shoud be within ±30PPM/°C)	
Adhesive Strength of Termination	No peeling shall be occur on the terminal electrode	500g·F, for 10±1 sec.
Bending Strength	Capacitance change : within ±5% or ±0.5pF whichever is larger	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±5 °C, 3±0.3sec. (preheating : 80~120 °C for 10~30sec.)
Resistance to Soldering heat	Capacitance change : within ±2.5% or ±0.25pF whichever is larger Tan δ, IR : initial spec.	Solder pot : 270±5 °C, 10±1sec.

	Performance	Test condition
Vibration Test	Capacitance change : within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger 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 $\pm 7.5\%$ or $\pm 0.75\text{pF}$ whichever is larger Q : 200 min IR : 500Mohm or $25\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	With rated voltage 40 ± 2 °C, 90~95%RH, 500+12/-0hrs
High Temperature Resistance	Capacitance change : within $\pm 3\%$ or $\pm 0.3\text{pF}$ whichever is larger Q : 350 min IR : 1000Mohm or $50\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	With 120% of the rated voltage Max. operating temperature 1000+48/-0hrs
Temperature Cycling	Capacitance change : within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger Tan δ , 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 $\pm 0/-5$ °C, 10sec. Max)

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