

SPECIFICATION

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

- Part Number : **CL31B225KBHNFNE**
- Description : **CAP, 2.2 μ F, 50V, $\pm$ 10%, X7R, 1206**

A. Samsung Part Number

CL **31** **B** **225** **K** **B** **H** **N** **F** **N** **E**
 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 ± 0.2	mm	W: 1.6 ± 0.2	mm					
③ Dielectric	X7R				⑧ Inner electrode	Ni				
④ Capacitance	2.2 μF				Termination	Cu				
⑤ Capacitance tolerance	±10 %				Plating	Sn 100% (Pb Free)				
⑥ Rated Voltage	50 V				⑨ Product	Product for POWER application				
⑦ Thickness	1.6 ± 0.2 mm				⑩ Special	Reserved for future use				
					⑪ Packaging	Embossed Type, 7" reel				

B. Samsung Reliability Test and Judgement condition

	Performance	Test condition
Capacitance	Within specified tolerance	1kHz $\pm$ 10% 1.0 $\pm$ 0.2Vrms
Tan δ (DF)	0.1 max.	
Insulation Resistance	10,000Mohm or 100Mohm $\cdot\mu$ 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	X7R (From -55 $^{\circ}$ C to 125 $^{\circ}$ 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	1) Sn63Pb37 solder 235 $\pm$ 5 $^{\circ}$ C, 5 $\pm$ 0.5sec. 2) 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.

	Performance	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)
Humidity	Capacitance change : within $\pm 12.5\%$ Tan δ : 0.125 max IR : 25M $\Omega \cdot \mu F$ or Over	40 $\pm 2^\circ\text{C}$, 90~95%RH, 500+12/-0hrs
Moisture Resistance	Capacitance change : within $\pm 12.5\%$ Tan δ : 0.125 max IR : 12.5M $\Omega \cdot \mu F$ 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 : 0.125 max IR : 25M $\Omega \cdot \mu F$ or Over	With 150% of the rated voltage Max. operating temperature 1000+48/-0hrs
Temperature Cycling	Capacitance change : within $\pm 7.5\%$ 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.