



SPECIFICATION

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

- Samsung P/N : [CL32B475KOINNNE](#)
- Description : CAP, 4.7 μ F, 16V, $\pm 10\%$, X7R, 1210

A. Samsung Part Number

CL **32** B **475** K **O** I **N** N **N** E
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Series	Samsung Multi-layer Ceramic Capacitor		
② Size	1210 (inch code)	L: 3.2 ± 0.3 mm	W: 2.5 ± 0.2 mm
③ Dielectric	X7R	⑧ Inner electrode	Ni
④ Capacitance	4.7 μ F	⑨ Termination	Cu
⑤ Capacitance tolerance	$\pm 10\%$	⑩ Plating	Sn 100% (Pb Free)
⑥ Rated Voltage	16 V	⑪ Product	Normal
⑦ Thickness	2.0 ± 0.2 mm	⑫ Special	Reserved for future use
		⑬ Packaging	Embossed Type, 7" reel

B. Samsung Reliability Test and Judgement condition

	Performance	Test condition	
Capacitance	Within specified tolerance	1kHz $\pm 10\%$	1.0 ± 0.2 Vrms
Tan δ (DF)	0.035 max.		
Insulation Resistance	10,000Mohm or 100Mohm· μ 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°C to 125°C, Capacitance change shoud be within $\pm 15\%$)		
Adhesive Strength of Termination	No peeling shall be occur on the terminal electrode	500g·F, for 10 ± 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 ± 5 °C, 3 ± 0.3 sec. (preheating : 80~120°C for 10~30sec.)	
Resistance to Soldering heat	Capacitance change : within $\pm 7.5\%$ Tan δ , IR : initial spec.	Solder pot : 270 ± 5 °C, 10 ± 1 sec.	

	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)
Moisture Resistance	Capacitance change : within $\pm 12.5\%$ Tan δ : 0.05 max IR : 500Mohm or $25\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	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 : 0.05 max IR : 1000Mohm or $50\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	With 200% 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°C, 10sec. Max)

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