

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : **CL21B473KCFNNNF**
- Description : **CAP, 47nF, 100V, ±10%, X7R, 0805**

## A. Samsung Part Number

CL   21   B   473   K   C   F   N   N   N   F  
①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

<b>① Series</b>	Samsung Multi-layer Ceramic Capacitor				
<b>② Size</b>	0805 (inch code)	L: 2.0 ± 0.1 mm	W: 1.25 ± 0.1 mm		
<b>③ Dielectric</b>	X7R	<b>⑧ Inner electrode</b>	Ni		
<b>④ Capacitance</b>	47 nF	<b>Termination</b>	Cu		
<b>⑤ Capacitance tolerance</b>	±10 %	<b>Plating</b>	Sn 100% (Pb Free)		
<b>⑥ Rated Voltage</b>	100 V	<b>⑨ Product</b>	Normal		
<b>⑦ Thickness</b>	1.25 ± 0.1 mm	<b>⑩ Special</b>	Reserved for future use		
		<b>⑪ Packaging</b>	Embossed Type, 13" 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>	0.025 max.	
<b>Insulation Resistance</b>	10,000Mohm or 500Mohm·μF Whichever is Smaller	Rated Voltage      60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscope (×10)
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	200% of the rated voltage
<b>Temperature Characterisitcs</b>	X7R (From -55℃ to 125℃, Capacitance change should be within ±15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g·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.

	Performance	Test condition
<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 $\delta$ : 0.05 max IR : 500Mohm or 25Mohm $\cdot \mu F$ Whichever is Smaller	With rated voltage 40 $\pm$ 2 $^{\circ}$ C , 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.05 max IR : 1000Mohm or 50Mohm $\cdot \mu F$ Whichever is Smaller	With 200% 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 $^{\circ}$ C $\rightarrow$ Max. operating temperature $\rightarrow$ 25 $^{\circ}$ C 5 cycle test

**C. Recommended Soldering method :**

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

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