

# SPECIFICATION

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

- Part Number : **CL21F225ZOFNONE**
- Description : **CAP, 2.2 $\mu$ F, -20+80%, 16V, Y5V, 0805**

## A. Samsung Part Number

CL   21   F   225   Z   O   F   N   O   N   E  
 ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

① Series	Samsung Multi-layer Ceramic Capacitor									
② Size	0805 (inch code)	L: 2.0	$\pm 0.1$	mm	W:	1.25	$\pm 0.1$	mm		
③ Dielectric	Y5V				⑧ Inner electrode	Ni				
④ Capacitance	2.2 $\mu$ F				Termination	Cu				
⑤ Capacitance tolerance	-20/+80 %				Plating	Sn 100% (Pb Free)				
⑥ Rated Voltage	16 V				⑨ Product	DF Spec strengthening products				
⑦ Thickness	1.25 $\pm 0.1$ 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 $\pm 0.2$ Vrms
Tan $\delta$ (DF)	0.07 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	Y5V (From -30 $^{\circ}$ C to 85 $^{\circ}$ C, Capacitance change should be within -82~+22%)	
Adhesive Strength of Termination	No peeling shall be occur on the terminal electrode	500g-F, for 10 $\pm 1$ sec.
Bending Strength	Capacitance change :    within $\pm 30\%$	Bending to the limit (1mm) with 1.0mm/sec.
Solderability	More than 95% of terminal surface is to be soldered newly	1) Sn63Pb37 solder 235 $\pm 5^{\circ}$ C, 5 $\pm 0.5$ sec. 2) SnAg3.0Cu0.5 solder 245 $\pm 5^{\circ}$ C, 3 $\pm 0.3$ sec. (preheating : 80~120 $^{\circ}$ C for 10~30sec.)
Resistance to Soldering heat	Capacitance change :    within $\pm 20\%$ Tan $\delta$ , IR : initial spec.	Solder pot : 270 $\pm 5^{\circ}$ C, 10 $\pm 1$ sec.

	Performance	Test condition
<b>Vibration Test</b>	Capacitance change : within $\pm 20\%$ Tan $\delta$ , IR : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours $\times$ 3 direction (x, y, z)
<b>Humidity</b>	Capacitance change : within $\pm 30\%$ Tan $\delta$ : 0.125 max IR : 1000Mohm or 50Mohm $\cdot \mu F$ Whichever is Smaller	40 $\pm 2$ °C, 90~95%RH, 500+12/-0hrs
<b>Moisture Resistance</b>	Capacitance change : within $\pm 30\%$ Tan $\delta$ : 0.125 max IR : 500Mohm or 25Mohm $\cdot \mu F$ Whichever is Smaller	With rated voltage 40 $\pm 2$ °C, 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 30\%$ Tan $\delta$ : 0.125 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 $\pm 20\%$ Tan $\delta$ , 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 : 250 $\pm 5$ °C, 6sec. Max )

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