



# THE DATASHEET OF CL21X475MAQNNNE



# SPECIFICATION

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

- Samsung P/N : **CL21X475MAQNNNE**
- Description : **CAP, 4.7 $\mu$ F, 25V,  $\pm$ 20%, X6S, 0805**

## A. Samsung Part Number

CL 21 X 475 M A Q N N 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 $\pm$ 0.15 mm	W: 1.25 $\pm$ 0.15 mm
③ Dielectric	X6S	⑧ Inner electrode	Ni
④ Capacitance	4.7 $\mu$ F	Termination	Cu
⑤ Capacitance tolerance	$\pm$ 20 %	Plating	Sn 100% (Pb Free)
⑥ Rated Voltage	25 V	⑨ Product	Normal
⑦ Thickness	1.25 $\pm$ 0.15 mm	⑩ Special	Reserved for future use
		⑪ Packaging	Embossed Type, 7"reel(2,000ea)

## B. Samsung Reliability Test and Judgement condition

	Performance	Test condition
Capacitance	Within specified tolerance	1kHz $\pm$ 10%      1.0 $\pm$ 0.2Vrms
Tan $\delta$ (DF)	0.1 max.	
Insulation Resistance	More than 100Mohm $\cdot\mu$ F	Rated Voltage      60~120 sec.
Appearance	No abnormal exterior appearance	Visual inspection
Withstanding Voltage	No dielectric breakdown or mechanical breakdown	250% of the rated voltage
Temperature Characteristics	X6S (From -55 $^{\circ}$ C to 105 $^{\circ}$ C, Capacitance change should be within $\pm$ 22%)	
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	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 $\delta$ , IR : initial spec.	Solder pot : 270 $\pm$ 5 $^{\circ}$ C, 10 $\pm$ 1sec.

	<b>Performance</b>	<b>Test condition</b>
<b>Vibration Test</b>	Capacitance change : within $\pm 10\%$ 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 $\delta$ : 0.2 max IR : More than $12.5M\Omega \cdot \mu F$	With rated voltage $40 \pm 2^\circ C$ , 90~95%RH, 500 +12/-0 hour
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.2 max IR : More than $25M\Omega \cdot \mu F$	With 100% of the rated voltage Max. operating temperature  1000+48/-0 hour
<b>Temperature Cycling</b>	Capacitance change : within $\pm 15\%$ Tan $\delta$ , IR : initial spec.	1 cycle condition Min. operating temperature $\rightarrow 25^\circ C$ $\rightarrow$ Max. operating temperature $\rightarrow 25^\circ C$  5 cycles 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.

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