



SPECIFICATION

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

- Samsung P/N : **CL21X475MAQNNNE**
- Description : **CAP, 4.7 μ 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 μ 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 δ (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 δ , IR : initial spec.	Solder pot : 270 \pm 5 $^{\circ}$ C, 10 \pm 1sec.

	Performance	Test condition
Vibration Test	Capacitance change : within $\pm 10\%$ 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 : 0.2 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
High Temperature Resistance	Capacitance change : within $\pm 12.5\%$ Tan δ : 0.2 max IR : More than $25M\Omega \cdot \mu F$	With 100% of the rated voltage Max. operating temperature 1000+48/-0 hour
Temperature Cycling	Capacitance change : within $\pm 15\%$ Tan δ , 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.