

# SPECIFICATION

(Reference sheet)

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

- Samsung P/N: **CL21A226MAQNNNE**
- Description : **CAP, 22uF, 25V, ±20%, X5R, 0805**

## A. Samsung Part Number

CL   21   A   226   M   A   Q   N   N   N   E  
 ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

① <b>Series</b>	Samsung Multi-layer Ceramic Capacitor		
② <b>Size</b>	0805 (inch code)	L: 2.00 ± 0.15 mm	W: 1.25 ± 0.15 mm
③ <b>Dielectric</b>	X5R	⑧ <b>Inner electrode</b>	Ni
④ <b>Capacitance</b>	22 uF	<b>Termination</b>	Cu
⑤ <b>Capacitance tolerance</b>	±20 %	<b>Plating</b>	Sn 100% (Pb Free)
⑥ <b>Rated Voltage</b>	25 V	⑨ <b>Product</b>	Normal
⑦ <b>Thickness</b>	1.25 ± 0.15 mm	⑩ <b>Special</b>	Reserved for future use
		⑪ <b>Packaging</b>	Embossed Type, 7" reel

## B. Structure & Dimension



Samsung P/N	Dimension(mm)			
	L	W	T	BW
CL21A226MAQNNNE	2.00 ± 0.15	1.25 ± 0.15	1.25 ± 0.15	0.50 +0.20/-0.30


### C. Samsung Reliability Test and Judgement Condition

	Judgement	Test condition
Capacitance	Within specified tolerance	120Hz $\pm 20\%$ / $0.5 \pm 0.1V_{rms}$
Tan $\delta$ (DF)	0.1 max.	*A capacitor prior to measuring the capacitance is heat treated at $150^{\circ}C + 0/-10^{\circ}C$ for 1 hour and maintained in ambient air for $24 \pm 2$ hours.
Insulation Resistance	10,000Mohm or $100Mohm \times \mu F$ 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 Characteristics	X5R (From $-55^{\circ}C$ to $85^{\circ}C$ , Capacitance change should be within $\pm 15\%$ )	
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 $\pm 12.5\%$	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 $245 \pm 5^{\circ}C$ , $3 \pm 0.3$ sec. (preheating : $80 \sim 120^{\circ}C$ for $10 \sim 30$ sec.)
Resistance to Soldering Heat	Capacitance change : within $\pm 7.5\%$ Tan $\delta$ , IR : initial spec.	Solder pot : $270 \pm 5^{\circ}C$ , $10 \pm 1$ sec.
Vibration Test	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)
Moisture Resistance	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.2 max IR : $500Mohm$ or $12.5Mohm \times \mu F$ Whichever is smaller	With rated voltage $40 \pm 2^{\circ}C$ , $90 \sim 95\%RH$ , $500 + 12/-0$ hrs
High Temperature Resistance	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.2 max IR : $1,000Mohm$ or $25Mohm \times \mu F$ Whichever is smaller	With 100% of the rated voltage Max. operating temperature $1000 + 48/-0$ hrs
Temperature Cycling	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

※ The reliability test condition can be replaced by the corresponding accelerated test condition.

### D. Recommended Soldering method :

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

-  Product specifications included in the specifications are effective as of March 1, 2013.  
Please be advised that they are standard product specifications for reference only.  
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- ② Automotive or Transportation equipment (vehicles, trains, ships, etc)
- ③ Medical equipment
- ④ Military equipment
- ⑤ Disaster prevention/crime prevention equipment
- ⑥ Any other applications with the same as or similar complexity or reliability to the applications set forth above.