

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N: **CL31B225KCHSNNE**
- Description : **CAP, 2.2 $\mu$ F, 100V,  $\pm$  10%, X7R, 1206**

## A. Samsung Part Number

CL   31   B   225   K   C   H   S   N   N   E  
①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

<b>① Series</b>	Samsung Multi-layer Ceramic Capacitor		
<b>② Size</b>	1206 (inch code)	L: 3.20 $\pm$ 0.20mm	W: 1.60 $\pm$ 0.20mm
<b>③ Dielectric</b>	X7R	<b>⑧ Inner electrode</b>	Ni
<b>④ Capacitance</b>	2.2 $\mu$ F	<b>Termination</b>	Cu_Ag Epoxy
<b>⑤ Capacitance tolerance</b>	$\pm$ 10 %	<b>Plating</b>	Sn 100% (Pb Free)
<b>⑥ Rated Voltage</b>	100 V	<b>⑨ Product</b>	Normal
<b>⑦ Thickness</b>	1.60 $\pm$ 0.20mm	<b>⑩ Special</b>	Reserved for future use
		<b>⑪ Packaging</b>	Embossed Type, 7" reel

## B. Samsung Reliability Test and Judgement condition

	Judgement	Test condition
<b>Capacitance</b>	Within specified tolerance	1kHz $\pm$ 10%      1.0 $\pm$ 0.2Vrms
<b>Tan <math>\delta</math> (DF)</b>	0.1 max.	
<b>Insulation Resistance</b>	10,000Mohm or 500Mohm $\cdot\mu$ F Whichever is Smaller	Rated Voltage      60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscope ( $\times$ 10)
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	200% of the rated voltage
<b>Temperature Characteristics</b>	X7R (From -55 $^{\circ}$ C to 125 $^{\circ}$ C, Capacitance change should be within $\pm$ 15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g $\cdot$ F, for 10 $\pm$ 1 sec.
<b>Bending Strength</b>	Capacitance change : within $\pm$ 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 $\pm$ 5 $^{\circ}$ C, 3 $\pm$ 0.3sec. (preheating : 80~120 $^{\circ}$ C for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change : within $\pm$ 7.5% Tan $\delta$ , IR : initial spec.	Solder pot : 270 $\pm$ 5 $^{\circ}$ C, 10 $\pm$ 1sec.

	<b>Judgement</b>	<b>Test condition</b>
<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 $\delta$ 0.125 max IR : 500Mohm or 12.5Mohm . $\mu F$ 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 $\delta$ 0.125 max IR : 1000Mohm or 25Mohm . $\mu F$ Whichever is Smaller	With 150% 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 )



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.

We may change, modify or discontinue the product specifications without notice at any time.

So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,  
please contact our sales personnel or application engineers.