



# SPECIFICATION (Reference sheet)

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : **CL05B181KB5NNNC**
- Description : **CAP, 180pF ±10%, 50V, X7R, 0402**

## A. Samsung Part Number

CL 05 B 181 K B 5 N N N C  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① <b>Series</b>	Samsung Multi-layer Ceramic Capacitor		
② <b>Size</b>	0402 (inch code)	L: $1.0 \pm 0.05$ mm	W: $0.5 \pm 0.05$ mm
③ <b>Dielectric</b>	X7R	⑧ <b>Inner electrode</b>	Ni
④ <b>Capacitance</b>	180 pF	⑨ <b>Termination</b>	Cu
⑤ <b>Capacitance tolerance</b>	±10%	⑩ <b>Plating</b>	Sn 100% (Pb Free)
⑥ <b>Rated Voltage</b>	50 V	⑪ <b>Product</b>	Normal
⑦ <b>Thickness</b>	$0.5 \pm 0.05$ mm	⑫ <b>Special</b>	Reserved for future use
		⑬ <b>Packaging</b>	Cardboard Type, 7" reel

## B. Samsung Reliability Test and Judgement condition

	Performance	Test condition
<b>Capacitance</b>	Within specified tolerance	$1\text{kHz} \pm 10\%$ $1.0 \pm 0.2\text{VRms}$
<b>Tan δ (DF)</b>	0.025 max.	
<b>Insulation Resistance</b>	10,000Mohm or $500\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	Rated Voltage $60 \sim 120$ sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscope ( $\times 10$ )
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	250% of the rated voltage
<b>Temperature Characteristics</b>	X7R (From $-55^\circ\text{C}$ to $125^\circ\text{C}$ , Capacitance change should be within $\pm 15\%$ )	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g·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 $245 \pm 5^\circ\text{C}$ , $3 \pm 0.3$ sec. (preheating : $80 \sim 120^\circ\text{C}$ for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change : within $\pm 7.5\%$ Tan δ, IR : initial spec.	Solder pot : $270 \pm 5^\circ\text{C}$ , $10 \pm 1$ sec.

	Performance	Test condition
<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 $\delta$ : 0.05 max IR : 500Mohm or $25\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	With rated voltage 40 $\pm 2^\circ\text{C}$ , 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.05 max IR : 1000Mohm or $50\text{Mohm} \cdot \mu\text{F}$ Whichever is Smaller	With 200% 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 $\rightarrow 25^\circ\text{C}$ $\rightarrow$ Max. operating temperature $\rightarrow 25^\circ\text{C}$ 5 cycle test

#### C. Recommended Soldering method :

Reflow ( Reflow Peak Temperature : 260 $\pm 0/-5^\circ\text{C}$ , 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.