



# SPECIFICATION

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

- Samsung P/N : [CL21B683KBCNNND](#)
- Description : CAP, 68nF, 50V, ±10%, X7R, 0805

## A. Samsung Part Number

|           |           |          |            |          |          |          |          |          |          |          |
|-----------|-----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|
| <b>CL</b> | <b>21</b> | <b>B</b> | <b>683</b> | <b>K</b> | <b>B</b> | <b>C</b> | <b>N</b> | <b>N</b> | <b>N</b> | <b>D</b> |
| 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: 2.0 ± 0.1 mm |                          |                          | W: 1.25 ± 0.1 mm |  |  |  |  |  |  |  |
| ③ <b>Dielectric</b>            | X7R                                   |  |  |                 | ⑧ <b>Inner electrode</b> | Ni                       |                  |  |  |  |  |  |  |  |
| ④ <b>Capacitance</b>           | 68 nF                                 |  |  |                 | 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>             | 0.85 ± 0.1 mm                         |  |  |                 | ⑫ <b>Special</b>         | Reserved for future use  |                  |  |  |  |  |  |  |  |
|                                |                                       |  |  |                 | ⑬ <b>Packaging</b>       | Cardboard Type, 13" reel |                  |  |  |  |  |  |  |  |

## B. Samsung Reliability Test and Judgement condition

|   | Performance   | Test condition   |
|---|---|--|
| <b>Capacitance</b>                      | Within specified tolerance  | 1kHz±10% 1.0±0.2Vrms   |
| <b>Tan δ (DF)</b>                       | 0.025 max.  |  |
| <b>Insulation Resistance</b>            | 10,000Mohm or 500Mohm·μF<br>Whichever is Smaller                        | Rated Voltage 60~120 sec.  |
| <b>Appearance</b>                       | No abnormal exterior appearance   | Microscope (×10)   |
| <b>Withstanding Voltage</b>             | No dielectric breakdown or mechanical breakdown                         | 250% of the rated voltage  |
| <b>Temperature Characterisitcs</b>      | X7R<br>(From -55 °C to 125 °C, Capacitance change shoud be within ±15%) |  |
| <b>Adhesive Strength of Termination</b> | No peeling shall be occur on the terminal electrode                     | 500g·F, for 10±1 sec.  |
| <b>Bending Strength</b>                 | Capacitance change : within ±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<br>245±5 °C, 3±0.3sec.<br>(preheating : 80~120 °C for 10~30sec.) |
| <b>Resistance to Soldering heat</b>     | Capacitance change : within ±7.5%<br>Tan δ, IR : initial spec.          | Solder pot : 270±5 °C, 10±1sec.  |

|                                    | Performance   | Test condition  |
|------------------------------------|---|---|
| <b>Vibration Test</b>              | Capacitance change : within $\pm 5\%$<br>Tan $\delta$ , IR : initial spec.  | Amplitude : 1.5mm<br>From 10Hz to 55Hz (return : 1min.)<br>2hours $\times$ 3 direction (x, y, z)  |
| <b>Moisture Resistance</b>         | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.05 max<br>IR : 500Mohm or $25\text{Mohm} \cdot \mu\text{F}$<br>Whichever is Smaller  | With rated voltage<br>40 $\pm 2^\circ\text{C}$ , 90~95%RH, 500+12/-0hrs   |
| <b>High Temperature Resistance</b> | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.05 max<br>IR : 1000Mohm or $50\text{Mohm} \cdot \mu\text{F}$<br>Whichever is Smaller | With 200% of the rated voltage<br>Max. operating temperature<br>1000+48/-0hrs   |
| <b>Temperature Cycling</b>         | Capacitance change : within $\pm 7.5\%$<br>Tan $\delta$ , IR : initial spec.  | 1 cycle condition<br>Min. operating temperature $\rightarrow 25^\circ\text{C}$<br>$\rightarrow$ Max. operating temperature $\rightarrow 25^\circ\text{C}$<br>5 cycle test |

**C. Recommended Soldering method :**

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

\* For the more detail Specification, Please refer to the Samsung MLCC catalogue.