



# SPECIFICATION

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

- Samsung P/N : **CL10B472KB8NNNC**
- Description : **CAP, 4.7nF, 50V, ±10%, X7R, 0603**

## A. Samsung Part Number

**CL 10 B 472 K B 8 N N N C**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

|                         |                                       |                   |                                   |
|-------------------------|---------------------------------------|-------------------|-----------------------------------|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |                   |                                   |
| ② Size                  | 0603 (inch code)                      | L: 1.6 ± 0.1 mm   | W: 0.8 ± 0.1 mm                   |
| ③ Dielectric            | X7R                                   | ⑧ Inner electrode | Ni                                |
| ④ Capacitance           | 4.7 nF                                | Termination       | Cu                                |
| ⑤ Capacitance tolerance | ±10 %                                 | Plating           | Sn 100% (Pb Free)                 |
| ⑥ Rated Voltage         | 50 V                                  | ⑨ Product         | Normal                            |
| ⑦ Thickness             | 0.8 ± 0.1 mm                          | ⑩ Special         | Reserved for future use           |
|                         |                                       | ⑪ Packaging       | Cardboard Type, 7" reel (4,000ea) |

## B. Samsung Reliability Test and Judgement condition

|                                  | Performance  | Test condition   |
|----------------------------------|--|--|
| Capacitance                      | Within specified tolerance   | 1kHz±10%<br>1.0±0.2Vrms  |
| Tan δ (DF)                       | 0.025 max.   |  |
| Insulation Resistance            | More than 500Mohm·μF   | 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      | X7R<br>(From -55°C to 125°C, Capacitance change should be within ±15%) |  |
| Adhesive Strength of Termination | No peeling shall be occur on the terminal electrode                    | 500g·F, for 10±1 sec.  |
| Bending Strength                 | Capacitance change : within ±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<br>245±5°C, 3±0.3sec.<br>(preheating : 80~120°C for 10~30sec.) |
| Resistance to Soldering heat     | 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 : More than $25M\Omega \cdot \mu F$ | With rated voltage<br>$40 \pm 2^\circ C$ , 90~95%RH, 500+12/-0 hour  |
| <b>High Temperature Resistance</b> | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.05 max<br>IR : More than $50M\Omega \cdot \mu F$ | With 200% of the rated voltage<br>Max. operating temperature<br><br>1000+48/-0 hour  |
| <b>Temperature Cycling</b>         | Capacitance change : within $\pm 7.5\%$<br>Tan $\delta$ , IR : initial spec.                                  | 1 cycle condition<br>Min. operating temperature $\rightarrow 25^\circ C$<br>$\rightarrow$ Max. operating temperature $\rightarrow 25^\circ C$<br><br>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.