

# SPECIFICATION

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

- Samsung P/N : **CL21C220FBANNNC**
- Description : **CAP, 22pF, 50V, ±1%, C0G, 0805**

## A. Samsung Part Number

**CL**   **21**   **C**   **220**   **F**   **B**   **A**   **N**   **N**   **N**   **C**  
 ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

|                         |                                       |                   |  |                         |  |  |  |  |  |  |
|-------------------------|---------------------------------------|-------------------|--|-------------------------|--|--|--|--|--|--|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |                   |  |                         |  |  |  |  |  |  |
| ② Size                  | 0805 (inch code)                      | L: 2.0 ± 0.1 mm   |  | W: 1.25 ± 0.1 mm        |  |  |  |  |  |  |
| ③ Dielectric            | C0G                                   | ⑧ Inner electrode |  | Ni                      |  |  |  |  |  |  |
| ④ Capacitance           | 22 pF                                 | Termination       |  | Cu                      |  |  |  |  |  |  |
| ⑤ Capacitance tolerance | ±1 %                                  | Plating           |  | Sn 100% (Pb Free)       |  |  |  |  |  |  |
| ⑥ Rated Voltage         | 50 V                                  | ⑨ Product         |  | Normal                  |  |  |  |  |  |  |
| ⑦ Thickness             | 0.65 ± 0.1 mm                         | ⑩ Special         |  | Reserved for future use |  |  |  |  |  |  |
|                         |                                       | ⑪ Packaging       |  | Cardboard Type, 7" reel |  |  |  |  |  |  |

## B. Samsung Reliability Test and Judgement condition

|                                  | Performance                                                                                      | Test condition                                                                   |
|----------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Capacitance                      | Within specified tolerance                                                                       | 1MHz±10%      0.5~5Vrms                                                          |
| Q                                | 840 min                                                                                          |                                                                                  |
| Insulation Resistance            | 10,000Mohm or 500Mohm·μF<br>Whichever is Smaller                                                 | Rated Voltage      60~120 sec.                                                   |
| Appearance                       | No abnormal exterior appearance                                                                  | Microscope (×10)                                                                 |
| Withstanding Voltage             | No dielectric breakdown or mechanical breakdown                                                  | 300% of the rated voltage                                                        |
| Temperature Characterisitcs      | C0G<br>(From -55℃ to 125℃, Capacitance change should be within ±30PPM/℃)                         |                                                                                  |
| Adhesive Strength of Termination | No peeling shall be occur on the terminal electrode                                              | 500g·F, for 10±1 sec.                                                            |
| Bending Strength                 | Capacitance change :<br>within ±5% or ±0.5pF whichever is larger                                 | Bending to the limit (1mm)<br>with 1.0mm/sec.                                    |
| Solderability                    | More than 75% of terminal surface is to be soldered newly                                        | SnAg3.0Cu0.5 solder<br>245±5℃, 3±0.3sec.<br>(preheating : 80~120℃ for 10~30sec.) |
| Resistance to Soldering heat     | Capacitance change :<br>within ±2.5% or ±0.25pF whichever is larger<br>Tan δ, IR : initial spec. | Solder pot : 270±5℃, 10±1sec.                                                    |

|                                    | Performance                                                                                                                                                                          | Test condition                                                                                                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vibration Test</b>              | Capacitance change :<br>within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger<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 :<br>within $\pm 7.5\%$ or $\pm 0.75\text{pF}$ whichever is larger<br>Q : 173.33 min<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 :<br>within $\pm 3\%$ or $\pm 0.3\text{pF}$ whichever is larger<br>Q : 330 min<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 :<br>within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger<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><br>5 cycle test |

### C. Recommended Soldering method :

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

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