

## SPECIFICATION

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

- Samsung P/N : **CL31B223KCCNFNC**
- Description : **CAP, 22nF, 100V, ±10%, X7R, 1206**

### A. Samsung Part Number

**CL**   **31**   **B**   **223**   **K**   **C**   **C**   **N**   **F**   **N**   **C**  
 ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

|                         |                                       |                   |                               |  |  |  |  |  |  |  |
|-------------------------|---------------------------------------|-------------------|-------------------------------|--|--|--|--|--|--|--|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |                   |                               |  |  |  |  |  |  |  |
| ② Size                  | 1206 (inch code)                      | L: 3.2 ± 0.15 mm  | W: 1.6 ± 0.15 mm              |  |  |  |  |  |  |  |
| ③ Dielectric            | X7R                                   | ⑧ Inner electrode | Ni                            |  |  |  |  |  |  |  |
| ④ Capacitance           | 22 nF                                 | Termination       | Cu                            |  |  |  |  |  |  |  |
| ⑤ Capacitance tolerance | ±10 %                                 | Plating           | Sn 100% (Pb Free)             |  |  |  |  |  |  |  |
| ⑥ Rated Voltage         | 100 V                                 | ⑨ Product         | Product for POWER application |  |  |  |  |  |  |  |
| ⑦ Thickness             | 0.85 ± 0.15 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                                           | 1kHz±10%      1.0±0.2Vrms                                                        |
| Tan δ (DF)                       | 0.025 max.                                                           |                                                                                  |
| 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                      | 200% of the rated voltage                                                        |
| Temperature Characterisitcs      | X7R<br>(From -55℃ to 125℃, 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℃, 3±0.3sec.<br>(preheating : 80~120℃ for 10~30sec.) |
| Resistance to Soldering heat     | Capacitance change : within ±7.5%<br>Tan δ, IR : initial spec.       | Solder pot : 270±5℃, 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 25Mohm $\cdot \mu F$<br>Whichever is Smaller  | With rated voltage<br>40 $\pm$ 2 $^{\circ}$ 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 50Mohm $\cdot \mu F$<br>Whichever is Smaller | With 200% of the rated voltage<br>Max. operating temperature<br><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 $^{\circ}$ C<br>$\rightarrow$ Max. operating temperature $\rightarrow$ 25 $^{\circ}$ C<br><br>5 cycle 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.