

# SPECIFICATION

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

- Samsung P/N : **CL10A226MQ8NUNE**
- Description : **CAP, 22 $\mu$ F, 6.3V,  $\pm$ 20%, X5R, 0603**

## A. Samsung Part Number

**CL**   **10**   **A**   **226**   **M**   **Q**   **8**   **N**   **U**   **N**   **E**  
 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 $\pm$ 0.25 mm | W: 0.8 $\pm$ 0.25 mm           |  |  |  |  |  |  |  |
| ③ Dielectric            | X5R                                   | ⑧ Inner electrode    | Ni                             |  |  |  |  |  |  |  |
| ④ Capacitance           | 22 $\mu$ F                            | Termination          | Cu                             |  |  |  |  |  |  |  |
| ⑤ Capacitance tolerance | $\pm$ 20 %                            | Plating              | Sn 100% (Pb Free)              |  |  |  |  |  |  |  |
| ⑥ Rated Voltage         | 6.3 V                                 | ⑨ Product            | 0603 Size dimension spec       |  |  |  |  |  |  |  |
| ⑦ Thickness             | 0.8 $\pm$ 0.25 mm                     | ⑩ Special            | Reserved for future use        |  |  |  |  |  |  |  |
|                         |                                       | ⑪ Packaging          | Embossed Type, 7"reel(3,000ea) |  |  |  |  |  |  |  |

## B. Samsung Reliability Test and Judgement condition

|                                  | Performance  | Test condition   |
|----------------------------------|--|--|
| Capacitance                      | Within specified tolerance   | 120Hz $\pm$ 20%   0.5 $\pm$ 0.1Vrms  |
| Tan $\delta$ (DF)                | 0.10 max.  |  |
| Insulation Resistance            | More than 50Mohm $\cdot\mu$ F  | 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      | X5R<br>(From -55 $^{\circ}$ C to 85 $^{\circ}$ C, Capacitance change should be within $\pm$ 15%) |  |
| Adhesive Strength of Termination | No peeling shall be occur on the terminal electrode  | 500g $\cdot$ F, for 10 $\pm$ 1 sec.  |
| Bending Strength                 | Capacitance change : within $\pm$ 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 $\pm$ 5 $^{\circ}$ C, 3 $\pm$ 0.3sec.<br>(preheating : 80~120 $^{\circ}$ C for 10~30sec.) |
| Resistance to Soldering heat     | Capacitance change : within $\pm$ 7.5%<br>Tan $\delta$ , IR : initial spec.                      | Solder pot : 270 $\pm$ 5 $^{\circ}$ C, 10 $\pm$ 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 $\delta$ : 0.25 max<br>IR : More than $8.8\text{M}\Omega \cdot \mu\text{F}$  | With rated voltage<br>$40 \pm 2^\circ\text{C}$ , 90~95%RH, 500 +12/-0 hours  |
| <b>High Temperature Resistance</b> | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.25 max<br>IR : More than $17.7\text{M}\Omega \cdot \mu\text{F}$ | With 100% of the rated voltage<br>Max. operating temperature<br><br>1000+48/-0 hours   |
| <b>Temperature Cycling</b>         | Capacitance change : within $\pm 10\%$<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 cycles 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.