

# SPECIFICATION

(Reference sheet)

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

- Samsung P/N : **CL31C222JHHNNNF**
- Description : **CAP, 2.2nF, 630V, ± 5%, COG, 1206**

## A. Samsung Part Number

**CL** **31** **C** **222** **J** **H** **H** **N** **N** **N** **F**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

|                                |                                       |                          |                         |  |
|--------------------------------|---------------------------------------|--------------------------|-------------------------|--|
| ① <b>Series</b>                | Samsung Multi-layer Ceramic Capacitor |                          |                         |  |
| ② <b>Size</b>                  | 1206 (inch code)                      | L: 3.20 ± 0.20 mm        | W: 1.60 ± 0.20 mm       |  |
| ③ <b>Dielectric</b>            | COG                                   | ⑧ <b>Inner electrode</b> | Ni                      |  |
| ④ <b>Capacitance</b>           | 2.2 nF                                | <b>Termination</b>       | Cu                      |  |
| ⑤ <b>Capacitance tolerance</b> | ± 5%                                  | <b>Plating</b>           | Sn 100% (Pb Free)       |  |
| ⑥ <b>Rated Voltage</b>         | 630 V                                 | ⑨ <b>Product</b>         | Normal                  |  |
| ⑦ <b>Thickness</b>             | 1.60 ± 0.20 mm                        | ⑩ <b>Special</b>         | Reserved for future use |  |
|                                |                                       | ⑪ <b>Packaging</b>       | Embossed Type, 13" reel |  |

## B. Structure and dimension



| Samsung P/N     | Dimension(mm) |             |             |             |
|-----------------|---------------|-------------|-------------|-------------|
|                 | L             | W           | T           | BW          |
| CL31C222JHHNNNF | 3.20 ± 0.20   | 1.60 ± 0.20 | 1.60 ± 0.20 | 0.50 ± 0.30 |

### C. Samsung Reliability Test and Judgement condition

|                                  | Performance  | Test condition  |
|----------------------------------|--|---|
| Capacitance                      | Within specified tolerance   | 1kHz±10% / 0.5~5Vrms  |
| Q                                | 1,000 min  |   |
| Insulation Resistance            | 10,000Mohm or 500Mohm× $\mu\text{F}$<br>Whichever is smaller   | 500 ±50 Vdc 60±5 sec.   |
| Appearance                       | No abnormal exterior appearance  | Microscop (X10)   |
| Withstanding Voltage             | No dielectric breakdown or mechanical breakdown  | 150% of the rated voltage   |
| Temperature Characteristics      | COG<br>(From -55°C to 125°C, Capacitance change should be within ±30PPM/°C)  |   |
| 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°C, 3±0.3sec.<br>(preheating : 80~120°C for 10~30sec.)                                |
| Resistance to Soldering heat     | Capacitance change :<br>within ±2.5% or ±0.25pF whichever is larger<br>Tan $\delta$ , IR : initial spec.   | Solder pot : 270±5°C, 10±1sec.  |
| Vibration Test                   | Capacitance change :<br>within ±2.5% or ±0.25pF whichever is larger<br>Tan $\delta$ , IR : initial spec.   | Amplitude : 1.5mm<br>From 10Hz to 55Hz (return : 1min.)<br>2hours ´ 3 direction (x, y, z)                         |
| Moisture Resistance              | Capacitance change :<br>within ±7.5% or ±0.75pF whichever is larger<br>Q : 200 min<br>IR : 500Mohm or 25Mohm × $\mu\text{F}$<br>Whichever is smaller | With rated voltage<br>40±2°C, 90~95%RH, 500+12/-0hrs  |
| High Temperature Resistance      | Capacitance change :<br>within ±3% or ±0.3pF whichever is larger<br>Q : 350 min<br>IR : 1,000Mohm or 50Mohm × $\mu\text{F}$<br>Whichever is smaller  | With 120% of the rated voltage<br>Max. operating temperature<br>1000+48/-0hrs                                     |
| Temperature Cycling              | Capacitance change :<br>within ±2.5% or ±0.25pF whichever is larger<br>Tan $\delta$ , IR : initial spec.   | 1 cycle condition<br>Min. operating temperature → 25°C<br>→ Max. operating temperature → 25°C<br><br>5 cycle test |

※ The reliability test condition can be replaced by the corresponding accelerated test condition.

### D. Recommended Soldering method :

Reflow ( Reflow Peak Temperature : 260+0/-5°C, 10sec. Max )

 Product specifications included in the specifications are effective as of March 1, 2013.

Please be advised that they are standard product specifications for reference only.

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