

# SPECIFICATION

(Reference sheet)

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

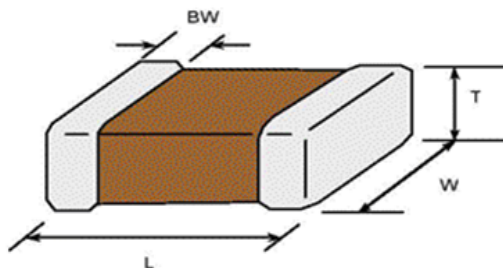
- Samsung P/N : **CL31C221JGFNFNE**
- Description : **CAP, 220pF, 500V, ± 5%, COG, 1206**

## A. Samsung Part Number

**CL** **31** **C** **221** **J** **G** **F** **N** **F** **N** **E**  
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

|                         |                                       |             |                   |                               |
|-------------------------|---------------------------------------|-------------|-------------------|-------------------------------|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |             |                   |                               |
| ② Size                  | 1206                                  | (inch code) | L: 3.20 ± 0.15 mm | W: 1.60 ± 0.15 mm             |
| ③ Dielectric            | C0G                                   |             | ⑧ Inner electrode | Ni                            |
| ④ Capacitance           | 220 pF                                |             | Termination       | Cu                            |
| ⑤ Capacitance tolerance | ± 5%                                  |             | Plating           | Sn 100% (Pb Free)             |
| ⑥ Rated Voltage         | 500 V                                 |             | ⑨ Product         | Product for POWER application |
| ⑦ Thickness             | 1.25 ± 0.15 mm                        |             | ⑩ Special         | Reserved for future use       |
|                         |                                       |             | ⑪ Packaging       | Embossed Type, 7" reel        |

## B. Structure and dimension



| Samsung P/N<br>(Lead Free) | Dimension(mm) |             |             |             |
|----------------------------|---------------|-------------|-------------|-------------|
|                            | L             | W           | T           | BW          |
| CL31C221JGFNFNE            | 3.20 ± 0.15   | 1.60 ± 0.15 | 1.25 ± 0.15 | 0.50 ± 0.30 |

### C. Samsung Reliability Test and Judgement condition

|                                  | Performance                                                                                                                                    | Test condition                                                                                                  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Capacitance                      | Within specified tolerance                                                                                                                     | 1MHz±10% / 0.5~5Vrms                                                                                            |
| Q                                | 1,000 min                                                                                                                                      |                                                                                                                 |
| Insulation Resistance            | 10,000Mohm or 500Mohm× $\mu$ F<br>Whichever is smaller                                                                                         | Rated Voltage 60~120 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℃ 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.                                                                                   |
| Vibration Test                   | Capacitance change :<br>within ±2.5% or ±0.25pF whichever is larger<br>Tan δ, 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 × $\mu$ F<br>Whichever is smaller | With rated voltage<br>40±2℃, 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 × $\mu$ F<br>Whichever is smaller  | With 150% 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 δ, IR : initial spec.                                               | 1 cycle condition<br>Min. operating temperature → 25℃<br>→ Max. operating temperature → 25℃<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℃, 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.

We may change, modify or discontinue the product specifications without notice at any time.

So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,  
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