

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Part Number : **CL31F226ZPHNNNE**
- Description : **CAP, 22 $\mu$ F, -20+80%, 10V, Y5V, 1206**

## A. Samsung Part Number

CL 31 F 226 Z P H N N 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: 3.2 | $\pm 0.2$ | mm | W:                | 1.6                             | $\pm 0.2$ | mm |  |  |
| ③ Dielectric            | Y5V                                   |        |           |    | ⑧ Inner electrode | Ni                              |           |    |  |  |
| ④ Capacitance           | 22 $\mu$ F                            |        |           |    | Termination       | Cu                              |           |    |  |  |
| ⑤ Capacitance tolerance | -20/+80 %                             |        |           |    | Plating           | Sn 100% (Pb Free)               |           |    |  |  |
| ⑥ Rated Voltage         | 10 V                                  |        |           |    | ⑨ Product         | Normal                          |           |    |  |  |
| ⑦ Thickness             | 1.6 $\pm 0.2$ mm                      |        |           |    | ⑩ Special         | Reserved for future use         |           |    |  |  |
|                         |                                       |        |           |    | ⑪ Packaging       | Embossed Type, 7" reel(2,000ea) |           |    |  |  |

## B. Samsung Reliability Test and Judgement condition

|                                  | Performance   | Test condition   |
|----------------------------------|---|--|
| Capacitance                      | Within specified tolerance  | 120Hz $\pm 20\%$ 0.5 $\pm 0.1$ Vrms  |
| Tan $\delta$ (DF)                | 0.125 max.  |  |
| Insulation Resistance            | More than 100Mohm $\cdot \mu$ 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 Characterisitcs      | Y5V<br>(From -30 $^{\circ}$ C to 85 $^{\circ}$ C, Capacitance change should be within -82~+22%) |  |
| 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 $\pm 30\%$  | 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 $\pm 0.3$ sec.<br>(preheating : 80~120 $^{\circ}$ C for 10~30sec.) |
| Resistance to Soldering heat     | Capacitance change : within $\pm 20\%$<br>Tan $\delta$ , IR : initial spec.                     | Solder pot : 270 $\pm 5^{\circ}$ C, 10 $\pm 1$ sec.  |

|                                    | <b>Performance</b>  | <b>Test condition</b>  |
|------------------------------------|---|--|
| <b>Vibration Test</b>              | Capacitance change : within $\pm 20\%$<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 $\delta$ : 0.16 max<br>IR : More than $12.5M\Omega \cdot \mu F$ | With rated voltage<br>$40 \pm 2^\circ C$ , 90~95%RH, 500 +12/-0 hour   |
| <b>High Temperature Resistance</b> | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.16 max<br>IR : More than $25M\Omega \cdot \mu F$   | With 150% of the rated voltage<br>Max. operating temperature<br><br>1000+48/-0 hour  |
| <b>Temperature Cycling</b>         | Capacitance change : within $\pm 20\%$<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 cycles test |

**C. Recommended Soldering method :**

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

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