SAMSUNG ELECTRO-MECHANICS

# SPECIFICATION

- **Supplier : Samsung electro-mechanics**
- **Product : Multi-layer Ceramic Capacitor**
- **Samsung P/N : CL21B224KOCNFNC**
- **Description : CAP, 220㎋, 16V, ±10%, X7R, 0805**

## A. Samsung Part Number

| CL | 21 | B | 224 | K | O | C | N | F | N | C |
|---|---|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ |

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|---|---|---|---|---|---|
| ① | **Series** | Samsung Multi-layer Ceramic Capacitor | | | |
| ② | **Size** | 0805 (inch code) | L: 2.0 ± 0.1 mm | W: 1.25 ± 0.1 mm | |
| ③ | **Dielectric** | X7R | ⑧ | **Inner electrode** | Ni |
| ④ | **Capacitance** | 220 ㎋ | | **Termination** | Cu |
| ⑤ | **Capacitance tolerance** | ±10 % | | **Plating** | Sn 100% (Pb Free) |
| | | | ⑨ | **Product** | Product for POWER application |
| ⑥ | **Rated Voltage** | 16 V | ⑩ | **Special** | Reserved for future use |
| ⑦ | **Thickness** | 0.85 ± 0.1 mm | ⑪ | **Packaging** | Cardboard Type, 7" reel |

## B. Samsung Reliablility Test and Judgement condition

| | Performance | Test condition |
|---|---|---|
| **Capacitance** | Within specified tolerance | 1㎑±10% 1.0±0.2Vrms |
| **Tan δ (DF)** | 0.035 max. | |
| **Insulation Resistance** | 10,000Mohm or 100Mohm·㎌ Whichever is Smaller | Rated Voltage 60~120 sec. |
| **Appearance** | No abnormal exterior appearance | Microscope (×10) |
| **Withstanding Voltage** | No dielectric breakdown or mechanical breakdown | 250% of the rated voltage |
| **Temperature Characterisitcs** | X7R (From -55℃ to 125℃, Capacitance change shoud 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 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.) |
| **Resistance to Soldering heat** | Capacitance change : within ±7.5% Tan δ, IR : initial spec. | Solder pot : 270±5℃, 10±1sec. |

| | Performance | Test condition |
|---|---|---|
| **Vibration Test** | Capacitance change : within ±5%<br>Tan δ, IR : initial spec. | Amplitude : 1.5mm<br>From 10㎐ to 55㎐ (return : 1min.)<br>2hours × 3 direction (x, y, z) |
| **Moisture Resistance** | Capacitance change : within ±12.5%<br>Tan δ : 0.05 max<br>IR : 500Mohm or 25Mohm ·㎌<br>Whichever is Smaller | With rated voltage<br>40±2℃, 90~95%RH, 500+12/-0hrs |
| **High Temperature Resistance** | Capacitance change : within ±12.5%<br>Tan δ : 0.05 max<br>IR : 1000Mohm or 50Mohm ·㎌<br>Whichever is Smaller | With 200% of the rated voltage<br>Max. operating temperature<br><br>1000+48/-0hrs |
| **Temperature Cycling** | Capacitance change : within ±7.5%<br>Tan δ, IR : initial spec. | 1 cycle condition<br>Min. operating temperature → 25℃<br>→ Max. operating temperature → 25℃<br><br>5 cycle test |

**C. Recommended Soldering method :**

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

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