



SPECIFICATION

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

- Samsung P/N: **CL05A475MP5NRNC**
- Description : **CAP, 4.7 μ F, 10V, \pm 20%, X5R, 0402**

A. Samsung Part Number

CL 05 A 475 M P 5 N R N C
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

| | | | |
|--------------------------------|---------------------------------------|--------------------------|--------------------------|
| ① Series | Samsung Multi-layer Ceramic Capacitor | | |
| ② Size | 0402 (inch code) | L: 1.0 \pm 0.15 mm | W: 0.5 \pm 0.15 mm |
| ③ Dielectric | X5R | ⑧ Inner electrode | Ni |
| ④ Capacitance | 4.7 μ F | Termination | Cu |
| ⑤ Capacitance tolerance | \pm 20 % | Plating | Sn 100% (Pb Free) |
| ⑥ Rated Voltage | 10 V | ⑨ Product | 0402 Size dimension spec |
| ⑦ Thickness | 0.5 \pm 0.15 mm | ⑩ Special | Reserved for future use |
| | | ⑪ Packaging | Cardboard Type, 7" reel |

B. Samsung Reliability Test and Judgement condition

| | Judgement | Test condition |
|---|--|--|
| Capacitance | Within specified tolerance | 1kHz \pm 10% 0.5 \pm 0.1Vrms |
| Tan δ (DF) | 0.125 max. | |
| Insulation Resistance | 10,000Mohm or 50Mohm $\cdot\mu$ F Whichever is Smaller | Rated Voltage 60~120 sec. |
| Appearance | No abnormal exterior appearance | Microscope (\times 10) |
| Withstanding Voltage | No dielectric breakdown or mechanical breakdown | 250% of the rated voltage |
| Temperature Characterisitcs | X5R (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 245 \pm 5 $^{\circ}$ C, 3 \pm 0.3sec. (preheating : 80~120 $^{\circ}$ C for 10~30sec.) |
| Resistance to Soldering heat | Capacitance change : within \pm 7.5% Tan δ , IR : initial spec. | Solder pot : 270 \pm 5 $^{\circ}$ C, 10 \pm 1sec. |

| | Judgement | Test condition |
|------------------------------------|--|---|
| Vibration Test | Capacitance change : within $\pm 5\%$ Tan δ , IR : initial spec. | Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours \times 3 direction (x, y, z) |
| Moisture Resistance | Capacitance change : within $\pm 12.5\%$ Tan δ 0.25 max IR : 8.8M $\Omega \cdot \mu F$ or Over | With rated voltage 40 ± 2 °C, 90~95%RH, 500+12/-0hrs |
| High Temperature Resistance | Capacitance change : within $\pm 12.5\%$ Tan δ 0.25 max IR : 17.7M $\Omega \cdot \mu F$ or Over | With 100% of the rated voltage Max. operating temperature 1000+48/-0hrs |
| Temperature Cycling | Capacitance change : within $\pm 10\%$ Tan δ , IR : initial spec. | 1 cycle condition Min. operating temperature \rightarrow 25°C \rightarrow Max. operating temperature \rightarrow 25°C 5 cycle test |

C. Recommended Soldering method :

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

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