

# SPECIFICATION

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : **CL21A476MQYNNNE**
- Description : **CAP, 47 $\mu$ F, 6.3V,  $\pm$ 20%, X5R, 0805**

## A. Samsung Part Number

CL 21 A 476 M Q Y N N N E  
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

|                         |                                       |                     |                         |
|-------------------------|---------------------------------------|---------------------|-------------------------|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |                     |                         |
| ② Size                  | 0805 (inch code)                      | L: 2.0 $\pm$ 0.2 mm | W: 1.25 $\pm$ 0.2 mm    |
| ③ Dielectric            | X5R                                   | ⑧ Inner electrode   | Ni                      |
| ④ Capacitance           | 47 $\mu$ F                            | Termination         | Cu                      |
| ⑤ Capacitance tolerance | $\pm$ 20 %                            | Plating             | Sn 100% (Pb Free)       |
| ⑥ Rated Voltage         | 6.3 V                                 | ⑨ Product           | Normal                  |
| ⑦ Thickness             | 1.25 $\pm$ 0.2 mm                     | ⑩ Special           | Reserved for future use |
|                         |                                       | ⑪ Packaging         | Embossed Type, 7" reel  |

## B. Samsung Reliability Test and Judgement condition

|                                  | Performance  | Test condition   |
|----------------------------------|--|--|
| Capacitance                      | Within specified tolerance   | 120Hz $\pm$ 20%<br>0.5 $\pm$ 0.1Vrms   |
| Tan $\delta$ (DF)                | 0.1 max.   |  |
| Insulation Resistance            | 10,000Mohm or 100Mohm $\cdot\mu$ F<br>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<br>(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-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<br>245 $\pm$ 5 $^{\circ}$ C, 3 $\pm$ 0.3sec.<br>(preheating : 80~120 $^{\circ}$ C for 10~30sec.) |
| Resistance to Soldering heat     | Capacitance change : within $\pm$ 7.5%<br>Tan $\delta$ , IR : initial spec.                      | Solder pot : 270 $\pm$ 5 $^{\circ}$ C, 10 $\pm$ 1sec.  |

|                                    | <b>Performance</b>  | <b>Test condition</b>   |
|------------------------------------|---|---|
| <b>Vibration Test</b>              | Capacitance change : within $\pm 5\%$<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 $\delta$ : 0.125 max<br>IR : 12.5M $\Omega \cdot \mu F$ or Over | With rated voltage<br>40 $\pm 2^\circ C$ , 90~95%RH, 500+12/-0hrs   |
| <b>High Temperature Resistance</b> | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.125 max<br>IR : 25M $\Omega \cdot \mu F$ or Over   | With 100% of the rated voltage<br>Max. operating temperature<br><br>1000+48/-0hrs   |
| <b>Temperature Cycling</b>         | Capacitance change : within $\pm 7.5\%$<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 cycle test |

**C. Recommended Soldering method :**

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

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