

SPECIFICATION (Reference sheet)

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : **CL32A476MQJNNNF**
- Description : **CAP, 47 μ F, 6.3V, \pm 20%, X5R, 1210**

A. Samsung Part Number

CL 32 A 476 M Q J N N N F
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

| | | | | | |
|-------------------------|---------------------------------------|-------------------|-------------------------|------------------|----|
| ① Series | Samsung Multi-layer Ceramic Capacitor | | | | |
| ② Size | 1210 (inch code) | L: 3.2 \pm 0.3 | mm | W: 2.5 \pm 0.2 | mm |
| ③ Dielectric | X5R | ⑧ Inner electrode | Ni | | |
| ④ Capacitance | 47 μ F | Termination | Cu | | |
| ⑤ Capacitance tolerance | \pm 20 % | Plating | Sn 100% (Pb Free) | | |
| ⑥ Rated Voltage | 6.3 V | ⑨ Product | Normal | | |
| ⑦ Thickness | 2.5 \pm 0.2 mm | ⑩ Special | Reserved for future use | | |
| | | ⑪ Packaging | Embossed Type, 13" reel | | |


B. Samsung Reliability Test and Judgement condition

| | Performance | Test condition |
|----------------------------------|--|--|
| Capacitance | Within specified tolerance | 120Hz \pm 20% 0.5 \pm 0.1Vrms *A capacitor prior to measuring the capacitance is heat treated at 150 ^\circ C+0/-10 ^\circ C, and maintained in ambient air for 24 \pm 2 hours. |
| Tan δ (DF) | 0.1 max. | |
| Insulation Resistance | 10,000Mohm or 100Mohm $\cdot\mu$ F Whichever is Smaller | 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 Characteristics | 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-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. |

| | Performance | 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 : 0.125 max IR : 500Mohm or 12.5 Mohm $\cdot \mu F$ Whichever is Smaller | With rated voltage 40 \pm 2 $^{\circ}C$, 90~95%RH, 500+12/-0 hours |
| High Temperature Resistance | Capacitance change : within $\pm 12.5\%$ Tan δ : 0.125 max IR : 1,000Mohm or 25Mohm $\cdot \mu F$ Whichever is Smaller | With 150% of the rated voltage Max. operating temperature 1000+48/-0 hours |
| Temperature Cycling | Capacitance change : within $\pm 7.5\%$ Tan δ , IR : initial spec. | 1 cycle condition Min. operating temperature $\rightarrow 25^{\circ}C$ \rightarrow Max. operating temperature $\rightarrow 25^{\circ}C$ 5 cycles test |

C. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260+0/-5 $^{\circ}C$, 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.
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Should you have any question regarding the product specifications,
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