

## SPECIFICATION

(Reference sheet)

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

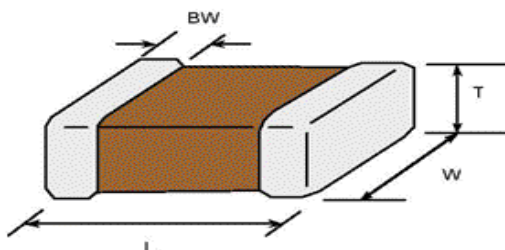
· Samsung P/N : **CL03A472KA3NNNC**  
· Description : **CAP, 4.7nF, 25V, ±10%, X5R, 0201**

### A. Samsung Part Number

CL   03   A   472   K   A   3   N   N   N   C  
①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

|                         |                                       |                    |                         |
|-------------------------|---------------------------------------|--------------------|-------------------------|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |                    |                         |
| ② Size                  | 0201 (inch code)                      | L : 0.60 ± 0.03 mm | W : 0.30 ± 0.03 mm      |
| ③ Dielectric            | X5R                                   | ⑧ Inner electrode  | Ni                      |
| ④ Capacitance           | 4.7 nF                                | Termination        | Cu                      |
| ⑤ Capacitance tolerance | ±10 %                                 | Plating            | Sn 100% (Pb Free)       |
| ⑥ Rated Voltage         | 25 V                                  | ⑨ Product          | Normal                  |
| ⑦ Thickness             | 0.30 ± 0.03 mm                        | ⑩ Special          | Reserved for future use |
|                         |                                       | ⑪ Packaging        | Cardboard Type, 7" reel |

### B. Structure & Dimension



| Samsung P/N     | Dimension(mm) |             |             |             |
|-----------------|---------------|-------------|-------------|-------------|
|                 | L             | W           | T           | BW          |
| CL03A472KA3NNNC | 0.60 ± 0.03   | 0.30 ± 0.03 | 0.30 ± 0.03 | 0.15 ± 0.05 |

### C. Samsung Reliability Test and Judgement Condition

|                                  | Judgement                                                                                                                             | Test condition                                                                                                                                                                |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capacitance                      | Within specified tolerance                                                                                                            | 1kHz $\pm 10\%$ / 1.0 $\pm 0.2$ Vrms                                                                                                                                          |
| Tan $\delta$ (DF)                | 0.1 max.                                                                                                                              | *A capacitor prior to measuring the capacitance is heat treated at 150°C+0/-10°C for 1hour and maintained in ambient air for 24 $\pm 2$ hours.                                |
| Insulation Resistance            | 10,000Mohm or 100Mohm $\times \mu F$<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 Characteristics      | X5R<br>(From -55°C to 85°C, Capacitance change should be within $\pm 15\%$ )                                                          |                                                                                                                                                                               |
| Adhesive Strength of Termination | No peeling shall be occur on the terminal electrode                                                                                   | 200g-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 $\pm 5^\circ\text{C}$ , 3 $\pm 0.3$ sec.<br>(preheating : 80~120°C for 10~30sec.)                                                                  |
| Resistance to Soldering Heat     | Capacitance change : within $\pm 7.5\%$<br>Tan $\delta$ , IR : initial spec.                                                          | Solder pot : 270 $\pm 5^\circ\text{C}$ , 10 $\pm 1$ sec.                                                                                                                      |
| Vibration Test                   | 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)                                                                              |
| Moisture Resistance              | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.2 max<br>IR : 500Mohm or 7.5Mohm $\times \mu F$<br>Whichever is smaller  | With rated voltage<br>40 $\pm 2^\circ\text{C}$ , 90~95%RH, 500+12/-0hrs                                                                                                       |
| High Temperature Resistance      | Capacitance change : within $\pm 12.5\%$<br>Tan $\delta$ : 0.2 max<br>IR : 1,000Mohm or 15Mohm $\times \mu F$<br>Whichever is smaller | With 150% of the rated voltage<br>Max. operating temperature<br>1,000+48/-0hrs                                                                                                |
| Temperature Cycling              | Capacitance change : within $\pm 7.5\%$<br>Tan $\delta$ , IR : initial spec.                                                          | 1 cycle condition<br>Min. operating temperature $\rightarrow 25^\circ\text{C}$<br>$\rightarrow$ Max. operating temperature $\rightarrow 25^\circ\text{C}$<br><br>5 cycle test |

※ The reliability test condition can be replaced by the corresponding accelerated test condition.

### D. Recommended Soldering method :

Reflow ( Reflow Peak Temperature : 260 $\pm 5^\circ\text{C}$ , 30sec. )



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.

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So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,

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- ⑤ Disaster prevention/crime prevention equipment*
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