

## SPECIFICATION

(Reference sheet)

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

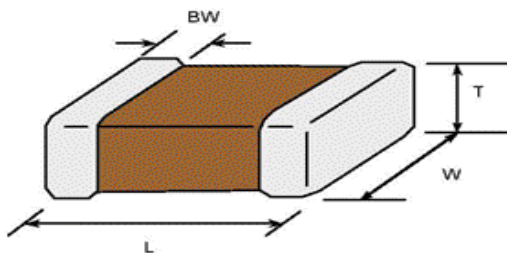
· Samsung P/N : **CL10F225ZO8NNNC**  
· Description : **CAP, 2.2 $\mu$ F, 16V, -20/+80%, Y5V, 0603**

### A. Samsung Part Number

CL   10   F   225   Z   O   8   N   N   N   C  
①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨   ⑩   ⑪

|                         |                                       |                        |                         |
|-------------------------|---------------------------------------|------------------------|-------------------------|
| ① Series                | Samsung Multi-layer Ceramic Capacitor |                        |                         |
| ② Size                  | 0603 (inch code)                      | L : 1.60 $\pm$ 0.10 mm | W : 0.80 $\pm$ 0.10 mm  |
| ③ Dielectric            | Y5V                                   | ⑧ Inner electrode      | Ni                      |
| ④ Capacitance           | 2.2 $\mu$ F                           | Termination            | Cu                      |
| ⑤ Capacitance tolerance | -20/+80 %                             | Plating                | Sn 100% (Pb Free)       |
| ⑥ Rated Voltage         | 16 V                                  | ⑨ Product              | Normal                  |
| ⑦ Thickness             | 0.80 $\pm$ 0.10 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              |
| CL10F225ZO8NNNC | 1.60 $\pm$ 0.10 | 0.80 $\pm$ 0.10 | 0.80 $\pm$ 0.10 | 0.30 $\pm$ 0.20 |

### 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)                | 0.09 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      | Y5V<br>(From -30 °C to 85 °C, Capacitance change should be within -82~+22%)                                                           |                                                                                                                                                       |
| 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 $\pm 30\%$                                                                                                | 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 $\pm 5$ °C, 3 $\pm 0.3$ sec.<br>(preheating : 80~120°C for 10~30sec.)                                                      |
| Resistance to Soldering Heat     | Capacitance change : within $\pm 20\%$<br>Tan $\delta$ , IR : initial spec.                                                           | Solder pot : 270 $\pm 5$ °C, 10 $\pm 1$ sec.                                                                                                          |
| Vibration Test                   | Capacitance change : within $\pm 20\%$<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 $\pm 30\%$<br>Tan $\delta$ : 0.125 max<br>IR : 500Mohm or 25Mohm $\times \mu F$<br>Whichever is smaller   | With rated voltage<br>40 $\pm 2$ °C, 90~95%RH, 500+12/-0hrs                                                                                           |
| High Temperature Resistance      | Capacitance change : within $\pm 30\%$<br>Tan $\delta$ : 0.125 max<br>IR : 1,000Mohm or 50Mohm $\times \mu F$<br>Whichever is smaller | With 200% of the rated voltage<br>Max. operating temperature<br>1,000+48/-0hrs                                                                        |
| Temperature Cycling              | Capacitance change : within $\pm 20\%$<br>Tan $\delta$ , IR : initial spec.                                                           | 1 cycle condition<br>Min. operating temperature $\rightarrow$ 25°C<br>$\rightarrow$ Max. operating temperature $\rightarrow$ 25°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 $\pm 5$ °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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