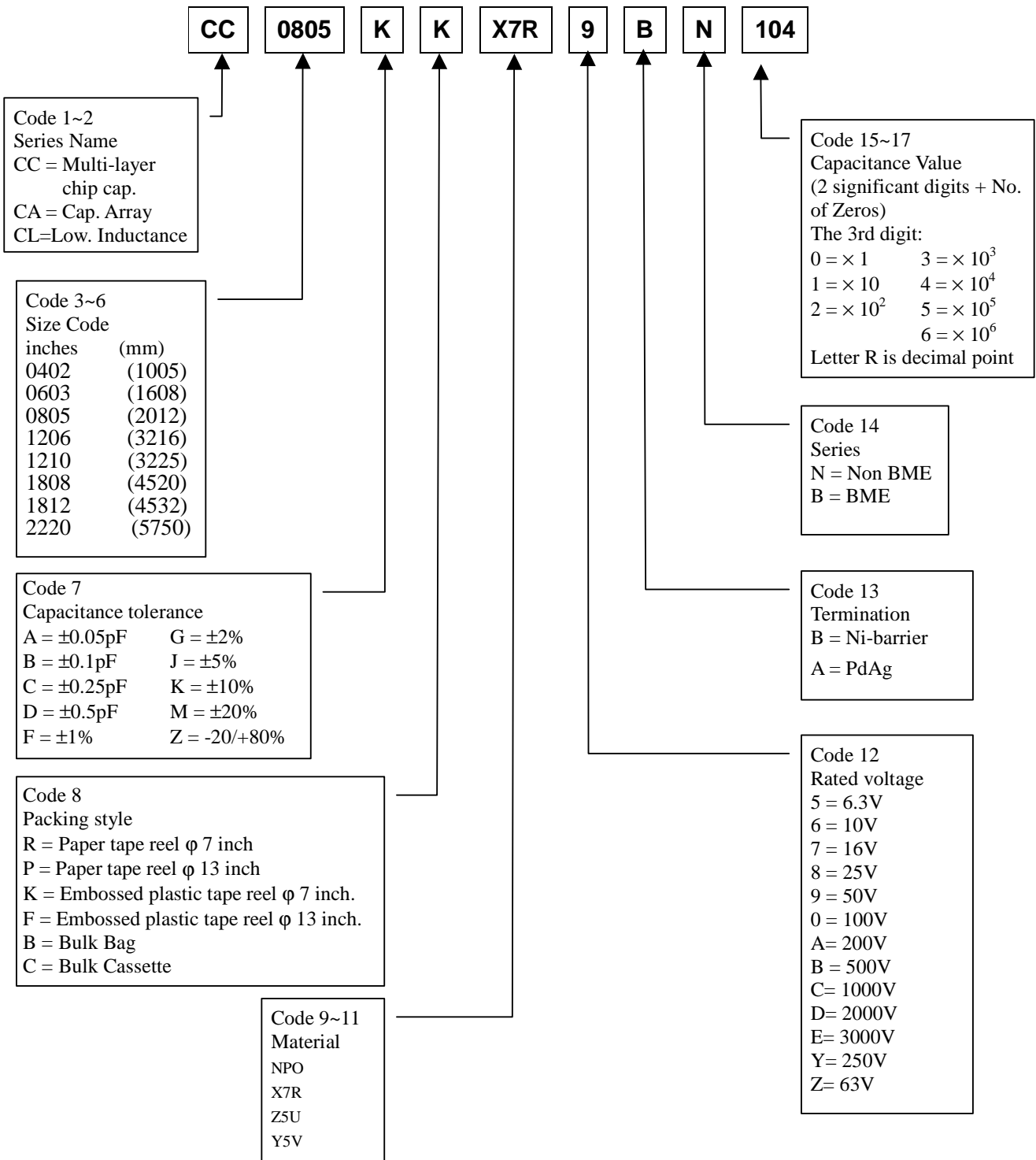


**1. SUBJECT:** This specification applies on the chip capacitor made by Yageo Corporation.

**2. PART NUMBER:** Part number of the chip capacitor is identified by the size, tolerance, packing, material and capacitor value.

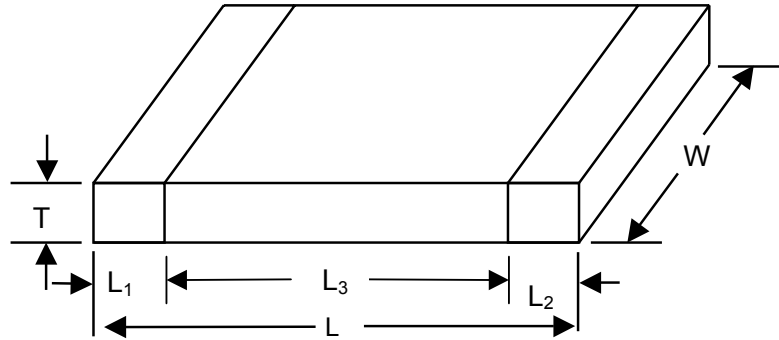
Example:



### 3. ELECTRICAL CHARACTERISTICS

| Characteristics                             | Test conditions  | Requirement   |  |   |   |
|---|--|---|--|---|---|
|   |  | Class I   | Class II   |   |   |
|   |  | NPO   | X7R  | Y5V   | Z5U   |
| Operation temperature range                 | _____  | -55°C to 125°C  | -55°C to 125°C   | -25°C to 85°C   | +10°C to +85°C  |
| Temperature characteristic/coefficient (TC) | With respect to 20°C (25°C, for Y5V、Z5U) within operation temperature range                              | NPO 16V, 0±60ppm/K<br>NPO >16V, 0±30ppm/K   | ±15%   | +30% to -80%  | +22% to -56%  |
| Capacitance tolerance                       | With respect to 20°C (25°C, for Y5V、Z5U)<br>NPO:   | C < 5pF; ±0.25pF<br>C ≥ 5pF; ±0.5pF<br>C ≥ 10pF; ±5%, ±10%  | ±10%, ±20%   | ±20%, -20%~+80%   | ±20%, -20%~+80%   |
| Dissipation factor (Tan δ)                  | C ≤ 1000pF 1Vrms/1MHz<br>C > 1000pF 1Vrms/1KHz<br><br>X7R/Y5V:<br>1Vrms/1KHz<br><br>Z5U:<br>0.5Vrms/1KHz | C < 10pF:<br>Tan δ ≤ 10(3/C+0.7)×10 <sup>-4</sup><br>or 30 × 10 <sup>-4</sup> whichever is less.<br><br>C ≥ 10pF<br>Tan δ ≤ 10 × 10 <sup>-4</sup> | Tan δ ≤ 2.5%, 50V<br>Tan δ ≤ 2.5%, 25V<br><br>Tan δ ≤ 3.5%, 16V<br><br>Tan δ ≤ 5%, 10V | Tan δ ≤ 5% or ≤ 7%,<br>25V/50V depending on capacitance value<br><br>Tan δ ≤ 9% or ≤ 12.5%,<br>16V depending on capacitance value<br><br>Tan δ ≤ 12.5%, 10V | Tan δ ≤ 4%, 50V<br>Tan δ ≤ 6%, 25V<br><br>Tan δ ≤ 9%, 16V |
| Insulation resistance(IR)                   | At Ur(rated voltage) for 1 minute<br>Ur>500V,at 500V(DC) for 1minute                                     | R <sub>ins</sub> > 10GΩ or<br>R <sub>ins</sub> ×C≥500s,<br>whichever is less.   | R <sub>ins</sub> > 10GΩ or<br>R <sub>ins</sub> ×C≥500s,<br>Whichever is less.          | R <sub>ins</sub> > 10GΩ or<br>R <sub>ins</sub> ×C≥100s,<br>whichever is less.   |   |
| Dielectric withstanding Voltage             | At 2.5Ur (for Ur ≤ 100V)<br>1.5Ur + 100V (for Ur > 100V)<br>1.5Ur,Ur=1000V<br>1.2Ur,Ur>1000V for 5Second | No breakdown  |  |   |   |

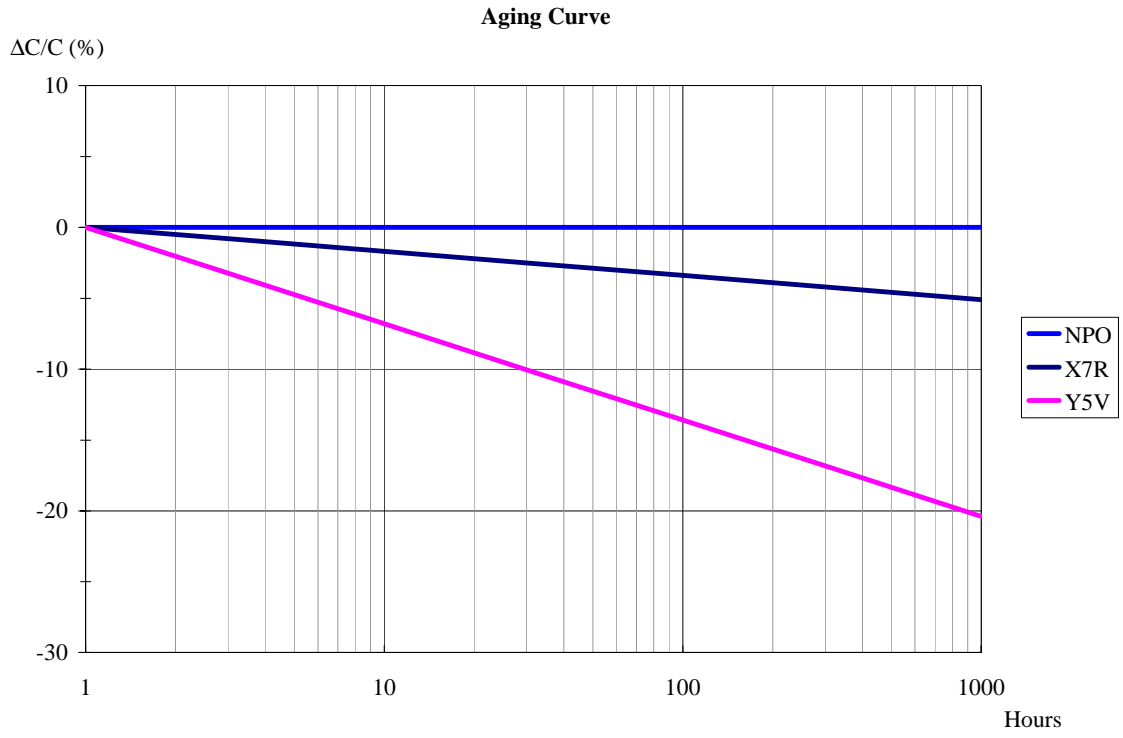
4. DIMENSION (mm)



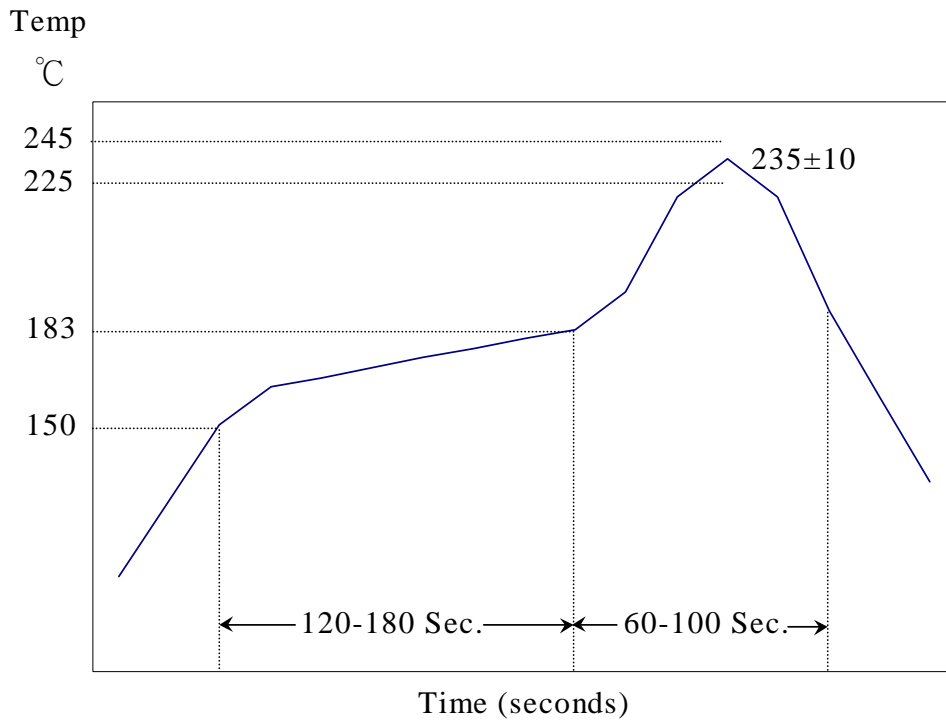
| Style  | L        | W         | T    |      | L <sub>1</sub> :L <sub>2</sub> |      | L <sub>3</sub> |
|--------|----------|-----------|------|------|--------------------------------|------|----------------|
|        |          |           | MIN. | MAX. | MIN.                           | MAX. | Min.           |
| CC0402 | 1.0±0.05 | 0.5±0.05  | 0.45 | 0.55 | 0.15                           | 0.30 | 0.40           |
| CC0603 | 1.6±0.10 | 0.8±0.10  | 0.70 | 0.90 | 0.20                           | 0.60 | 0.40           |
| CC0805 | 2.0±0.10 | 1.25±0.10 | 0.50 | 1.35 | 0.25                           | 0.75 | 0.55           |
| CC1206 | 3.2±0.15 | 1.6±0.15  | 0.50 | 1.35 | 0.25                           | 0.75 | 1.40           |
| CC1210 | 3.2±0.20 | 2.5±0.20  | 0.50 | 1.80 | 0.25                           | 0.75 | 1.40           |
| CC1812 | 4.5±0.20 | 3.2±0.20  | 0.50 | 1.80 | 0.25                           | 0.75 | 2.20           |
| CC2220 | 5.7±0.20 | 5.0±0.20  | 0.50 | 1.80 | 0.25                           | 0.75 | 2.20           |

Unit: mm

Aging Rate



Reflow Profile



Profile Parameters 參數

1-2°C/Sec ramp 溫昇

Preheat 150-183°C : 2-3 minutes

Time above 183°C : 60-100 seconds

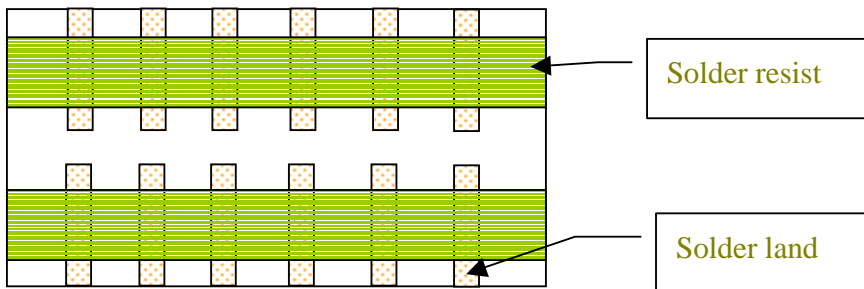
Peak Temperature : 230±10°C

Module should only be in oven for 5.5-6 minute

5. TESTS AND REQUIREMENTS

| IEC 384-10 | Test items                   | Conditions   | Requirements  |  |   |
|------------|------------------------------|--|---|--|---|
|            |                              |  | NPO   | X7R  | Y5V   |
| 4.9        | Bending                      | Bending rate 1mm/s, jig. Radius 340mm  | $\Delta C/C \leq 1\%$   | $\Delta C/C \leq 10\%$   | $\Delta C/C \leq 20\%$  |
| 4.10       | Resistance to soldering heat | 260±5°C for 10±0.5s in static solder bath  | $\Delta C/C \leq 0.5\%$ or 0.5pF, whichever is greater  | -5% ≤ $\Delta C/C \leq 10\%$   | -10% ≤ $\Delta C/C \leq 20\%$   |
| 4.11       | Solderability                | 235±5°C for 2±0.5 s in a static solder bath  | 75% minimum coverage of metallic area   |  |   |
| 4.12       | Rapid change of temperature  | NPO/X7R: -55°C to +125°C, 5 cycles<br>Y5V: -25°C to +85°C, 5 cycles  | $\Delta C/C \leq 1\%$ or 1pF, whichever is greater  | $\Delta C/C \leq 15\%$   | $\Delta C/C \leq 20\%$  |
| 4.14       | Damp heat, steady state      | At 40°C, 90 to 95% RH and Ur applied (max. 500V, for 56 days (500 hours for Y5V)<br>Class 2 only 56 days at 40°C, 90 to 95% RH, No voltage (for Ur ≥ 1kV)<br>Precondition for Class 2 Ur ≤ 16V                               | $\Delta C/C: 2\%$ or 1pF whichever is greater<br><br>Tan δ : ≤ 2xspecified Value<br><br>IR: 2500MΩ or RxC ≥ 25s whichever is less | $\Delta C/C \leq 15\%$<br><br>Tan δ : ≤ 7%<br><br>IR: 1000MΩ or RxC ≥ 25s<br>Whichever is less | -40% ≤ $\Delta C/C \leq 30\%$<br><br>Tan δ : ≤ 7%, 12.5%, 15%<br><br>IR: 1000MΩ or RxC ≥ 25s<br>Whichever is less |
| 4.15       | Endurance                    | At upper category temperature, 2xUr applied (1.5Ur for Ur > 50V, 1.2Ur for Ur ≥ 1KV) for 1000hours<br>Class 2 only 1000 hours, At upper category temperature, No voltage (for Ur ≥ 1KV)<br>Precondition for Class 2 Ur ≤ 16V | $\Delta C/C: 2\%$ or 1pF whichever is greater<br><br>Tan δ : ≤ 2xspecified Value<br><br>IR: 4000MΩ or RxC ≥ 40s whichever is less | $\Delta C/C \leq 20\%$<br><br>Tan δ : ≤ 7%<br><br>IR: 2000MΩ or RxC ≥ 50s<br>Whichever is less | -40% ≤ $\Delta C/C \leq 30\%$<br><br>Tan δ : ≤ 7%, 12.5%, 15%<br><br>IR: 2000MΩ or RxC ≥ 50s<br>Whichever is less |

PCB Layout for Reliability test:



## NPO

| Capacitance | 16V  |      | 25V  |      |      |      | 50V  |      |      |      | 100V |      |      |      | 200V |      |      |      | 500V |      |      | 1kV  |      | 2kV  |      | 3kV  |      | 4kV  |      |      |      |      |  |  |  |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|
|             | 0402 | 0603 | 0402 | 0603 | 0805 | 1206 | 1210 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 0603 | 0805 | 1206 | 1210 | 1812 | 0805 | 1206 | 1210 | 1812 | 1206 | 1210 | 1812 | 1206 | 1812 | 1206 | 1808 | 1812 | 1808 | 1812 |  |  |  |
| (pF) 0.47   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 0.56        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 0.68        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 0.82        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1.0         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1.2         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1.5         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1.8         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 2.2         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 2.7         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 3.3         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 3.9         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 4.7         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 5.6         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 6.8         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 8.2         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 10          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 12          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 15          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 18          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 22          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 33          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 39          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 47          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 56          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 68          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 82          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 100         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 120         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 150         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 180         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 220         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 270         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 330         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 390         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 470         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 560         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 680         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 820         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1000        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1200        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1500        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 1800        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 2200        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 2700        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 3300        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 3900        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 4700        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 5600        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 6800        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 8200        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 10 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 12 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 15 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 18 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 22 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 27 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 33 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 39 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
| 47 000      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |

## X7R

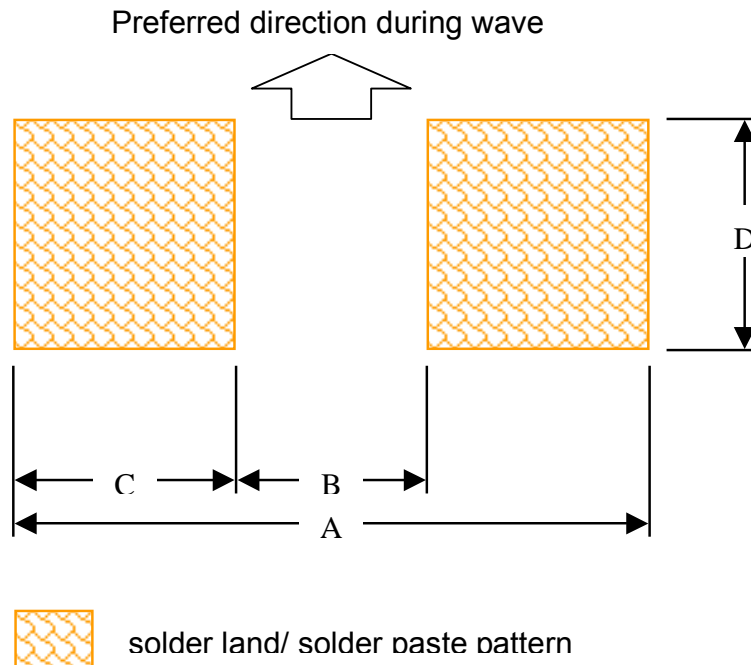
| Capacitance<br>(nF) | 10V  |      |      | 16V  |      |      | 25V  |      |      |      |      | 50V  |      |      |      |      | 100V |      |      |      | 200V |      |      |      | 500V |      |      | 1kV  |      |      | 2kV  |      |      |      |      |  |  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
|                     | 0603 | 0805 | 1206 | 0402 | 0603 | 0805 | 1206 | 0402 | 0603 | 0805 | 1206 | 1210 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2220 | 0805 | 1206 | 1210 | 1812 | 0805 | 1206 | 1210 | 1812 | 1206 | 1210 | 1812 | 1206 | 1808 | 1812 | 1808 | 1812 |  |  |
| 0.1                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.12                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.15                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.18                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.22                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.27                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.33                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.47                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.56                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.68                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 0.82                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1.2                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1.5                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1.8                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 2.2                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 2.7                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 3.3                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 3.9                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 4.7                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 5.6                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 6.8                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 8.2                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 10                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 12                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 15                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 18                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 22                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 27                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 33                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 39                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 47                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 56                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 68                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 82                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 100                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 120                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 150                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 180                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 220                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 270                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 330                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 390                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 470                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 560                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 680                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 820                 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1000                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1200                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1500                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 1800                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 2200                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 2700                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 3300                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 3900                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 4700                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |



## Y5V

| Capacitance | Y5V 10V |      |      |      | Y5V 16V |      |      |      |      | Y5V 25V |      |      |      | Y5V 50V |      |      | Z5U 25V |      | Z5U 50V |      |      |   |
|-------------|---------|------|------|------|---------|------|------|------|------|---------|------|------|------|---------|------|------|---------|------|---------|------|------|---|
|             | 0603    | 0805 | 1206 | 1210 | 0402    | 0603 | 0805 | 1206 | 1210 | 0603    | 0805 | 1206 | 1210 | 0603    | 0805 | 1206 | 0603    | 1206 | 0805    | 1206 | 1210 |   |
| (uF) 0.010  |         |      |      |      | ■       |      |      |      |      | ■       |      |      |      | ■       | ■    |      | ■       |      | ■       | ■    |      |   |
| 0.022       |         |      |      |      | ■       |      |      |      |      | ■       |      |      |      | ■       | ■    |      | ■       |      | ■       | ■    |      |   |
| 0.047       |         |      |      |      | ■       |      |      |      |      | ■       |      |      |      | ■       | ■    |      | ■       |      | ■       | ■    |      |   |
| 0.10        |         |      |      |      | ■       |      |      |      |      | ■       | ■    | ■    |      | ■       | ■    | ■    | ■       |      | ■       | ■    | ■    | ■ |
| 0.22        |         |      |      |      |         | ■    |      |      |      |         | ■    | ■    |      |         | ■    | ■    |         |      | ■       | ■    | ■    | ■ |
| 0.47        |         |      |      |      |         | ■    | ■    |      |      |         | ■    | ■    |      |         | ■    | ■    |         |      | ■       | ■    | ■    | ■ |
| 1.0         | ■       |      | ■    |      |         |      | ■    | ■    |      |         | ■    | ■    |      |         |      | ■    |         | ■    |         |      | ■    | ■ |
| 2.2         |         | ■    | ■    |      |         |      | ■    | ■    |      |         | ■    | ■    |      |         |      |      |         |      |         |      |      |   |
| 3.3         |         | ■    | ■    |      |         |      |      | ■    |      |         |      |      |      |         |      |      |         |      |         |      |      |   |
| 4.7         |         |      | ■    |      |         |      |      |      |      |         |      |      |      |         |      |      |         |      |         |      |      |   |
| 10          |         |      | ■    |      |         |      |      |      | ■    |         |      |      | ■    |         |      |      |         |      |         |      |      |   |
| 22          |         |      | ■    | ■    |         |      |      |      |      |         |      |      |      |         |      |      |         |      |         |      |      |   |

### commended dimension of solder lands



#### Reflow soldering

| Style  | FOOTPRINT DIMENSIONS (mm) |     |      |     | Placement Accuracy (mm) |
|--------|---------------------------|-----|------|-----|-------------------------|
|        | A                         | B   | C    | D   |                         |
| CC0402 | 1.5                       | 0.5 | 0.5  | 0.5 | ±0.15                   |
| CC0603 | 2.3                       | 0.5 | 0.9  | 0.9 | ±0.25                   |
| CC0805 | 2.8                       | 0.9 | 0.95 | 1.4 | ±0.25                   |
| CC1206 | 4.0                       | 2.0 | 1.0  | 1.8 | ±0.25                   |
| CC1210 | 4.0                       | 2.0 | 1.0  | 2.7 | ±0.25                   |
| CC1808 | 5.4                       | 3.3 | 1.05 | 3.3 | ±0.25                   |
| CC1812 | 5.4                       | 3.3 | 1.05 | 3.3 | ±0.25                   |
| CC2220 | 6.6                       | 4.5 | 1.05 | 3.3 | ±0.25                   |

#### Wave soldering

| Style  | FOOTPRINT DIMENSIONS (mm) |     |      |     | Placement Accuracy (mm) |
|--------|---------------------------|-----|------|-----|-------------------------|
|        | A                         | B   | C    | D   |                         |
| CC0603 | 2.7                       | 0.9 | 0.9  | 0.8 | ±0.25                   |
| CC0805 | 3.4                       | 1.3 | 1.05 | 1.3 | ±0.25                   |
| CC1206 | 4.8                       | 2.3 | 1.25 | 1.7 | ±0.25                   |
| CC1210 | 5.3                       | 2.3 | 1.50 | 2.6 | ±0.25                   |

## MLCC QC Flow Chart

| Process Flow     |                     |           | Process Stage      | Control Point   |
|------------------|---------------------|-----------|--------------------|---|
| Mat'l Process    | Prepare process     | Due Stage |                    |   |
| Powder           | Incoming Inspection |           |                    | Analysis of powder  |
| Binder           |                     |           | Ball Mill          | Recipe<br>Milling time<br>Viscosity   |
| inner paste      | incoming inspection |           | Foil Casting       | Foil Weight   |
|                  |                     |           | Screen Printing    | Printing width laydown  |
|                  |                     |           | Pressing           | Pressure<br>Temperature   |
|                  |                     |           | Cutting            | Free Margin   |
|                  |                     |           | Binder Burn Out    | Weight loss%  |
| outer paste      | incoming inspection |           | Sintering          | Thermo-ring temperature   |
|                  |                     |           | Tumbling           | Rolling speed   |
|                  |                     |           | Dipping            | Termination length  |
|                  |                     |           | Curing             | Profile setting   |
|                  |                     |           | Inner defect check | Destructure Physical Analysis   |
|                  |                     |           | Plating            | Solderability<br>Tin concentration<br>Ni concentration<br>Tin thickness<br>Nickel thickness     |
|                  |                     |           | Testing            | C% 1st piece check<br>Mechanical<br>M/C setting   |
|                  |                     |           | Mechanical visual  | Mechanical defect   |
|                  |                     |           | QA                 | Cap/TanD<br>IR+HV<br>Body fault item<br>End term. fault item<br>Dimension item<br>Solderability |
| Packing Material |                     |           | Taping             | Peel off force<br>Product defect  |
|                  |                     |           | Taping Q/A         | Taping defect   |
|                  |                     |           | Stock              |   |

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Multilayer Ceramic Capacitors MLCC - SMD/SMT category:](#)*

*Click to view products by [Yageo manufacturer:](#)*

Other Similar products are found below :

[D55342E07B523DR-T/R](#) [NCA1206X7R103K50TRPF](#) [NCA1206X7R104K16TRPF](#) [NIN-FB391JTRF](#) [NIN-FC2R7JTRF](#)  
[NMC0402NPO220J50TRPF](#) [NMC0402X5R105K6.3TRPF](#) [NMC0402X5R224K6.3TRPF](#) [NMC0402X7R103J25TRPF](#)  
[NMC0402X7R153K16TRPF](#) [NMC0603NPO330G50TRPF](#) [NMC0603NPO331F50TRPF](#) [NMC0603X5R475M6.3TRPF](#)  
[NMC0805NPO220J100TRPF](#) [NMC0805NPO270J50TRPF](#) [NMC0805NPO681F50TRPF](#) [NMC0805NPO820J50TRPF](#)  
[NMC1206X7R102K50TRPF](#) [NMC1210Y5V105Z50TRPLPF](#) [NMC-H0805X7R472K250TRPF](#) [NMC-L0402NPO7R0C50TRPF](#) [NMC-](#)  
[L0603NPO2R2B50TRPF](#) [NMC-Q0402NPO8R2D200TRPF](#) [C1206C101J1GAC](#) [C1608C0G2A221J](#) [C1608X7R1E334K](#) [C2012C0G2A472J](#)  
[2220J2K00562KXT](#) [KHC201E225M76N0T00](#) [1812J2K00332KXT](#) [CCR06CG153FSV](#) [CDR14BP471CJUR](#) [CDR31BX103AKWR](#)  
[CDR33BX683AKUS](#) [CGA2B2C0G1H010C](#) [CGA2B2C0G1H040C](#) [CGA2B2C0G1H050C](#) [CGA2B2C0G1H060D](#) [CGA2B2C0G1H070D](#)  
[CGA2B2C0G1H120J](#) [CGA2B2C0G1H151J](#) [CGA2B2C0G1H1R5C](#) [CGA2B2C0G1H2R2C](#) [CGA2B2C0G1H390J](#) [CGA2B2C0G1H391J](#)  
[CGA2B2C0G1H3R3C](#) [CGA2B2C0G1H680J](#) [CGA2B2C0G1H6R8D](#) [CGA2B2C0G1H820J](#) [CGA2B2X8R1H152K](#)