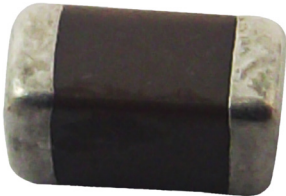


**Ultra-small Multilayer SMD Ceramic Capacitor  
0201 Size, NP0, X7R, X5R Dielectrics (6.3V to 50V)**

**multicomp** PRO

**RoHS  
Compliant**



**Description:**

MLCC consists of a conducting material and electrodes. To manufacture a chip-type SMT and achieve miniaturization, high density and high efficiency, ceramic condensers are used. 0201 MLCC is performed by high precision technology achieve high capacitance in unit size and ensure the stability and reliability of products.

**Features:**

- High capacitance in unit size.
- High precision dimensional tolerances.
- Suitable used in high-accuracy automatic mounting machine.

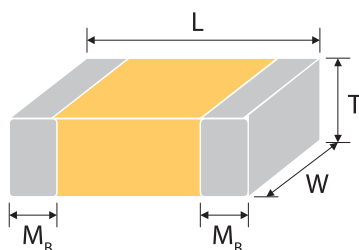
**Applications:**

- Miniature microwave module.
- Portable equipments (ex. Mobile phone, PDA).
- High frequency circuits.

**How To Order:**

| MC   | 31                       | X                                | 225  | K   | 100   | C                  | T                      |
|------|--------------------------|----------------------------------|--|---|---|--------------------|------------------------|
|      | <u>Size</u>              | <u>Dielectric</u>                | <u>Capacitance</u>   | <u>Tolerance</u>  | <u>Rated Voltage</u>  | <u>Termination</u> | <u>Packaging style</u> |
| Type | Inch (mm)<br>0201 (0603) | N=NP0<br>(COG)<br>B=X7R<br>X=X5R | Two significant digits followed by no. of zeros. And R is in place of decimal point.<br><br>Eg.:<br>0R5 = 0.5pF<br>1R0 = 1.0pF<br>102 = 10x10 <sup>2</sup> = 1,000pF | A=±0.05pF<br>B=±0.1pF<br>C=±0.25pF<br>D=±0.5pF<br>F=±1%<br>G=±2%<br>J=±5%<br>K=±10%<br>M=±20%<br>Z=-20/+80% | Two significant digits followed by no. of zeros. And R is in place of decimal point.<br><br>6R3=6.3V DC<br>100=10V DC<br>160=16V DC<br>250=25V DC<br>500=50V DC | C=Cu/Ni/Sn         | T = 7" reeled          |

**External Dimensions:**



The outline of MLCC

| Size<br>Inch (mm) | L (mm)      | W (mm)     | T max<br>(mm)/Symbol | M <sub>B</sub> (mm) |
|-------------------|-------------|------------|----------------------|---------------------|
| 0201 (0603)       | 0.6 ±0.03   | 0.30±0.03  | 0.3 ±0.03            | L<br>0.15 ±0.05     |
|                   | 0.6 ±0.05#1 | 0.3±0.05#1 | 0.3 ±0.05#1          |                     |

\* Reflow soldering only.  
#1 For 0201/Cap≥0.68uF

**Ultra-small Multilayer SMD Ceramic Capacitor  
0201 Size, NP0, X7R, X5R Dielectrics (6.3V to 50V)**



**General Electrical Data:**

| Size                        | 0201   |                                       |                             |
|-----------------------------|--|---------------------------------------|-----------------------------|
| Dielectric                  | NP0  | X7R                                   | X5R                         |
| Capacitance*                | 0.1pF to 120pF   | 100pF to 10nF                         | 100pF to 1μF                |
| Capacitance tolerance**     | Cap≤5pF <sup>#1</sup> :<br>A (±0.05pF), B (±0.1pF), C (±0.25pF)<br>5pF<Cap<10pF:<br>B (±0.1pF), C (±0.25pF), D(±0.5pF)<br>Cap≥10pF:<br>F (±1%), G (±2%), J (±5%), K (±10%) | J (±5%), K (±10%), M (±20%)           | J (±5%), K (±10%), M (±20%) |
| Rated voltage (WVDC)        | 16V, 25V, 50V  | 6.3V, 10V, 16V, 25V, 50V              | 6.3V, 10V, 16V, 25V, 50V    |
| Tan δ / Q*                  | Cap<30pF, Q≥400+20C<br>Cap≥30pF, Q≥1000  | Note 1                                |                             |
| Insulation resistance at Ur | ≥10GΩ  | ≥10GΩ or RxC≥500ΩxF whichever is less |                             |
| Operating temperature       | -55 to +125°C  |                                       | -55 to +85°C                |
| Capacitance change          | ±30ppm   | ±15%                                  |                             |
| Termination                 | Ni/Sn (lead-free termination)  |                                       |                             |

#1: NP0, 0.1pF product only provide B tolerance

\* Measured at 30~70% related humidity.

NP0: Apply 1.0±0.2Vrms, 1.0MHz±10% at the condition of 25°C ambient temperature.

X7R, X5R: Apply 1.0±0.2Vrms, 1.0kHz±10%(0201/6.3V, Cap≥224 : 0.5±0.2Vrms, 1.0kHz±10%) at the condition of 25°C ambient temperature.

\*\* Preconditioning for Class II MLCC: Perform a heat treatment at 150±10°C for 1 hour, then leave in ambient condition for 24±2 hours before measurement.

**Note 1:**

X7R/X5R

| Rated vol. | D.F.  | Exception of D.F. |              |
|------------|-------|-------------------|--------------|
| ≥50V       | ≤3%   | -                 |              |
| 25V        | ≤3.5% | ≤5%               | 0201≥0.01μF  |
| 16V        | ≤3.5% | ≤5%               | 0201≥0.01μF  |
| 10V        | ≤5%   | ≤10%              | 0201≥0.012μF |
|            |       | ≤15%              | 0201≥0.1μF   |
| 6.3V       | ≤10%  | ≤15%              | 0201≥0.1μF   |

**Packaging Dimension And Quantity:**

| Size        | Thickness (mm)/Symbol   |   | Paper tape |          |
|-------------|-------------------------|---|------------|----------|
|             |                         |   | 7" reel    | 13" reel |
| 0201 (0603) | 0.3 ±0.03               | L | 15,000     | 70,000   |
|             | 0.3 ±0.05 <sup>#1</sup> |   | 15,000     | -        |

Unit : pieces

**Reliability Test Conditions and Requirements:**

| No         | Item                             | Test Condition   | Requirements   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
|------------|----------------------------------|--|--|----------------|-----------|-------------------|-----|------------------|-----|-----------------|--|------|--------------------|-----------|------------------|-----|-------------|-----|-------------|-----|-----|------|--------------|------|------------|------|------|------|
| 1          | Visual and Mechanical            | -  | No remarkable defect.<br>Dimensions to conform to individual specification sheet.  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 2          | Capacitance                      | Class I: NP0<br>Cap≤1000pF, 1.0±0.2Vrms, 1MHz±10%<br>Cap>1000pF, 1.0±0.2Vrms, 1kHz±10%<br>Class II: X7R, X5R<br>1.0±0.2Vrms, 1kHz±10%**<br>**0.5±0.2Vrms, 1.0kHz±10% : 0201<br>≥0.22 uF(6.3V)  | Shall not exceed the limits given in the detailed spec.<br><br>NP0: Cap≥30pF, Q≥1000; Cap<30pF, Q≥400+20C<br>X7R, X5R:   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 3          | Q/ D.F.<br>(Dissipation Factor)  |  | <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>≥50V</td> <td>≤3%</td> <td>-</td> <td></td> </tr> <tr> <td>25V</td> <td>≤3.5%</td> <td>≤5%</td> <td>0201≥0.01μF</td> </tr> <tr> <td>16V</td> <td>≤3.5%</td> <td>≤5%</td> <td>0201≥0.01μF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤5%</td> <td>≤10%</td> <td>0201≥0.012μF</td> </tr> <tr> <td>≤15%</td> <td>0201≥0.1μF</td> </tr> <tr> <td>6.3V</td> <td>≤10%</td> <td>≤15%</td> <td>0201≥0.1μF</td> </tr> </tbody> </table> | Rated vol.     | D.F       | Exception of D.F. |     | ≥50V             | ≤3% | -               |  | 25V  | ≤3.5%              | ≤5%       | 0201≥0.01μF      | 16V | ≤3.5%       | ≤5% | 0201≥0.01μF | 10V | ≤5% | ≤10% | 0201≥0.012μF | ≤15% | 0201≥0.1μF | 6.3V | ≤10% | ≤15% |
| Rated vol. | D.F                              | Exception of D.F.  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| ≥50V       | ≤3%                              | -  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 25V        | ≤3.5%                            | ≤5%  | 0201≥0.01μF  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 16V        | ≤3.5%                            | ≤5%  | 0201≥0.01μF  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 10V        | ≤5%                              | ≤10%   | 0201≥0.012μF   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
|            |                                  | ≤15%   | 0201≥0.1μF   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 6.3V       | ≤10%                             | ≤15%   | 0201≥0.1μF   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 4          | Dielectric Strength              | To apply voltage (≤100V) 250%.<br>Duration: 1 to 5 sec.<br>Charge and discharge current less than 50mA.  | No evidence of damage or flash over during test.   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 5          | Insulation Resistance            | To apply rated voltage for max. 120sec.  | ≥10GΩ or RxC≥500Ω-F whichever is smaller.<br>Class II (X5R, X6S, X7R, Y5V)   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 6          | Temperature Coefficient          | With no electrical load. <table border="1"> <thead> <tr> <th>T.C.</th> <th>Operating Temp</th> </tr> </thead> <tbody> <tr> <td>NP0 (C0G)</td> <td>55~125°C at 25°C</td> </tr> <tr> <td>X7R</td> <td>55~125°C at 25°C</td> </tr> <tr> <td>X5R</td> <td>25~85°C at 20°C</td> </tr> </tbody> </table> | T.C.   | Operating Temp | NP0 (C0G) | 55~125°C at 25°C  | X7R | 55~125°C at 25°C | X5R | 25~85°C at 20°C | <table border="1"> <thead> <tr> <th>T.C.</th> <th>Capacitance Change</th> </tr> </thead> <tbody> <tr> <td>NP0 (C0G)</td> <td>Within ±30ppm/°C</td> </tr> <tr> <td>X7R</td> <td>Within ±15%</td> </tr> <tr> <td>X5R</td> <td>Within ±15%</td> </tr> </tbody> </table> | T.C. | Capacitance Change | NP0 (C0G) | Within ±30ppm/°C | X7R | Within ±15% | X5R | Within ±15% |     |     |      |              |      |            |      |      |      |
| T.C.       | Operating Temp                   |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| NP0 (C0G)  | 55~125°C at 25°C                 |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| X7R        | 55~125°C at 25°C                 |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| X5R        | 25~85°C at 20°C                  |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| T.C.       | Capacitance Change               |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| NP0 (C0G)  | Within ±30ppm/°C                 |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| X7R        | Within ±15%                      |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| X5R        | Within ±15%                      |  |  |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |
| 7.         | Adhesive Strength of Termination | Pressurizing force : 2N<br>Test time: 10±1 sec.  | No remarkable damage or removal of the terminations.   |                |           |                   |     |                  |     |                 |  |      |                    |           |                  |     |             |     |             |     |     |      |              |      |            |      |      |      |

**Ultra-small Multilayer SMD Ceramic Capacitor  
0201 Size, NP0, X7R, X5R Dielectrics (6.3V to 50V)**



| No   | Item                         | Test Condition  | Requirements   |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
|------|------------------------------|---|--|------------|-------------|---|----------------------------|------|---|------------|-----|---|----------------------------|------|---|------------|-----|--|
| 8    | Vibration Resistance         | Vibration frequency: 10~55 Hz/min.<br>Total amplitude: 1.5mm<br>Test time: 6 hrs. (Two hrs each in three mutually perpendicular directions.)<br>Measurement to be made after keeping at room temp. for 24±2 hrs.  | No remarkable damage.<br>Cap change and Q/D.F.: To meet initial spec.  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 9    | Solderability                | Solder temperature: 235±5°C<br>Dipping time: 2±0.5 sec.   | 95% min. coverage of all metalized area  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 10   | Bending Test                 | The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1mm per second until the deflection becomes : 5mm and then the pressure shall be maintained for 5±1 sec.<br>Measurement to be made after keeping at room temp. for 24±2 hrs.  | No remarkable damage.<br>Cap change:<br>NP0: within ±5.0% or ±0.5pF whichever is larger.<br>X7R, X5R: within ±12.5%<br>Y5V: within ±30%<br>(This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.) |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 11   | Resistance to Soldering Heat | Solder temperature: 260±5°C<br>Dipping time: 10±1 sec<br>Preheating: 120 to 150°C for 1 minute before immerse the capacitor in a eutectic solder.<br>Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 24±2 hrs at room temp.<br>Measurement to be made after keeping at room temp. for 24±2 hrs.   | No remarkable damage.<br>Cap change:<br>NP0: within ±2.5% or ±0.25pF whichever is larger.<br>X7R, X5R: within ±7.5%<br>Y5V: within ±20%<br>Q/D.F., I.R. and dielectric strength: To meet initial requirements.<br>25% max. leaching on each edge.  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 12   | Temperature Cycle            | Conduct the five cycles according to the temperatures and time.<br><table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temp. (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. operating temp. +0/-3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>2~3</td> </tr> <tr> <td>3</td> <td>Max. operating temp. +3/-0</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>2~3</td> </tr> </tbody> </table><br>Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 24±2 hrs at room temp.<br>Measurement to be made after keeping at room temp. for 24±2 hrs. | Step   | Temp. (°C) | Time (min.) | 1 | Min. operating temp. +0/-3 | 30±3 | 2 | Room temp. | 2~3 | 3 | Max. operating temp. +3/-0 | 30±3 | 4 | Room temp. | 2~3 | No remarkable damage.<br>Cap change:<br>NP0: within ±2.5% or ±0.25pF whichever is larger.<br>X7R, X5R: within ±7.5%<br>Y5V: within ±20%<br>Q/D.F., I.R. and dielectric strength: To meet initial requirements. |
| Step | Temp. (°C)                   | Time (min.)   |  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 1    | Min. operating temp. +0/-3   | 30±3  |  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 2    | Room temp.                   | 2~3   |  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 3    | Max. operating temp. +3/-0   | 30±3  |  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |
| 4    | Room temp.                   | 2~3   |  |            |             |   |                            |      |   |            |     |   |                            |      |   |            |     |  |

**Ultra-small Multilayer SMD Ceramic Capacitor  
0201 Size, NP0, X7R, X5R Dielectrics (6.3V to 50V)**



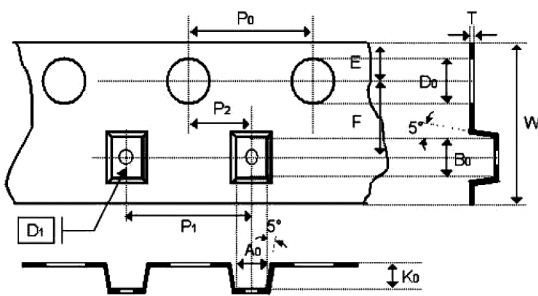
| No         | Item                                    | Test Condition   | Requirements   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
|------------|---|--|--|------------|-----|-------------------|--|------|-----|---|--|-----|-----|------|-------------|-----|-----|------|-------------|-----|-------|------|--------------|------|------------|------|------|------|------------|
| 13         | Humidity<br>(Damp Heat)<br>Steady State | <p>Test temp.: 40±2°C<br/>Humidity: 90~95% RH<br/>Test time: 500+24/-0hrs.<br/>Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 24±2 hrs at room temp<br/>Measurement to be made after keeping at room temp. for 24±2 hrs.</p>  | <p>No remarkable damage.<br/>Cap change : NP0: within ±5.0% or ±0.5pF whichever is larger.<br/>X7R, X5R: ≥10V, within ±12.5%,<br/>10V ≧ 0.1µF, within ±25%;<br/>6.3V, within ±25%<br/>Y5V: ≥10V, within ±30%<br/>6.3V, within +30/-40%</p> <p>Q/D.F. value:<br/>NP0: Cap≥30pF, Q≥350; 10pF≤Cap&lt;30pF, Q≥275+2.5C<br/>Cap&lt;10pF; Q≥200+10C<br/>X7R, X5R:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>≥50V</td> <td>≤6%</td> <td>-</td> <td></td> </tr> <tr> <td>25V</td> <td>≤5%</td> <td>≤10%</td> <td>0201≥0.01µF</td> </tr> <tr> <td>16V</td> <td>≤5%</td> <td>≤15%</td> <td>0201≥0.01µF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤7.5%</td> <td>≤15%</td> <td>0201≥0.012µF</td> </tr> <tr> <td>≤20%</td> <td>0201≥0.1µF</td> </tr> <tr> <td>6.3V</td> <td>≤15%</td> <td>≤30%</td> <td>0201≥0.1µF</td> </tr> </tbody> </table> <p>I.R.: ≥10V, ≥1GΩ or RxC≥50Ω-F whichever is smaller.<br/>6.3V; 10V:0201≥47nF, RxC≥10Ω-F</p> | Rated vol. | D.F | Exception of D.F. |  | ≥50V | ≤6% | - |  | 25V | ≤5% | ≤10% | 0201≥0.01µF | 16V | ≤5% | ≤15% | 0201≥0.01µF | 10V | ≤7.5% | ≤15% | 0201≥0.012µF | ≤20% | 0201≥0.1µF | 6.3V | ≤15% | ≤30% | 0201≥0.1µF |
| Rated vol. | D.F                                     | Exception of D.F.  |  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| ≥50V       | ≤6%                                     | -  |  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 25V        | ≤5%                                     | ≤10%   | 0201≥0.01µF  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 16V        | ≤5%                                     | ≤15%   | 0201≥0.01µF  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 10V        | ≤7.5%                                   | ≤15%   | 0201≥0.012µF   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
|            |   | ≤20%   | 0201≥0.1µF   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 6.3V       | ≤15%                                    | ≤30%   | 0201≥0.1µF   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 14         | Humidity<br>(Damp Heat)<br>Load         | <p>Test temp.: 40±2°C<br/>Humidity: 90~95%RH<br/>Test time: 500+24/-0 hrs.<br/>To apply voltage : rated voltage<br/>Before initial measurement (Class II only): To apply test voltage for 1hr at 40°C and then set for 24±2 hrs at room temp.<br/>Measurement to be made after keeping at room temp. for 24±2 hrs.</p> | <p>No remarkable damage.<br/>Cap change: NP0: within ±7.5% or ±0.75pF whichever is larger.<br/>X7R, X5R: ≥10V, within ±12.5%,<br/>10V ≧ 0.1µF, within ±25%;<br/>6.3V, within ±25%<br/>Y5V: ≥10V, within ±30%<br/>6.3V, within +30/-40%</p> <p>Q/D.F. value:<br/>NP0: Cap≥30pF, Q≥200; Cap&lt;30pF, Q≥100+10/3C<br/>X7R/X5R:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>≥50V</td> <td>≤6%</td> <td>-</td> <td></td> </tr> <tr> <td>25V</td> <td>≤5%</td> <td>≤10%</td> <td>0201≥0.01µF</td> </tr> <tr> <td>16V</td> <td>≤5%</td> <td>≤15%</td> <td>0201≥0.01µF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤7.5%</td> <td>≤15%</td> <td>0201≥0.012µF</td> </tr> <tr> <td>≤20%</td> <td>0201≥0.1µF</td> </tr> <tr> <td>6.3V</td> <td>≤15%</td> <td>≤30%</td> <td>0201≥0.1µF</td> </tr> </tbody> </table> <p>I.R.: ≥10V,500MΩ or RxC≥25Ω-F whichever is smaller.<br/>6.3V; 10V:0201≥47nF, RxC≥5Ω-F</p>                                  | Rated vol. | D.F | Exception of D.F. |  | ≥50V | ≤6% | - |  | 25V | ≤5% | ≤10% | 0201≥0.01µF | 16V | ≤5% | ≤15% | 0201≥0.01µF | 10V | ≤7.5% | ≤15% | 0201≥0.012µF | ≤20% | 0201≥0.1µF | 6.3V | ≤15% | ≤30% | 0201≥0.1µF |
| Rated vol. | D.F                                     | Exception of D.F.  |  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| ≥50V       | ≤6%                                     | -  |  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 25V        | ≤5%                                     | ≤10%   | 0201≥0.01µF  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 16V        | ≤5%                                     | ≤15%   | 0201≥0.01µF  |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 10V        | ≤7.5%                                   | ≤15%   | 0201≥0.012µF   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
|            |   | ≤20%   | 0201≥0.1µF   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |
| 6.3V       | ≤15%                                    | ≤30%   | 0201≥0.1µF   |            |     |                   |  |      |     |   |  |     |     |      |             |     |     |      |             |     |       |      |              |      |            |      |      |      |            |



| No         | Item                              | Test Condition   | Requirements   |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
|------------|-----------------------------------|--|--|------------|-----|-------------------|--|------|-----|---|--|-----|-----|------|---------------|-----|-----|------|---------------|-----|-------|------|----------------|------|--------------|------|------|------|--------------|
| 15         | High Temperature Load (Endurance) | Test temp.:<br>NP0, X7R: 125±3°C<br>X5R, Y5V: 85±3°C<br>To apply voltage:<br>1) Cap. ≥ 0.1µF : 100% of rated voltage<br>2) 6.3V: 150% of rated voltage.<br>3) >6.3V: 200% of rated voltage.<br>Test time: 1,000+24/-0 hrs.<br>Before initial measurement (Class II only): To apply test voltage for 1hr at test temp. and then set for 24±2 hrs at room temp.<br>Measurement to be made after keeping at room temp. for 24±2 hrs | No remarkable damage.<br>Cap change: NP0: within ±3.0% or ±0.3pF whichever is larger.<br>X7R, X5R: ≥10V, within ±12.5%,<br>10V ≧ 0.1µF, within ±25%;<br>6.3V, within ±25%<br>Y5V: ≥10V, within ±30%<br>6.3V, within +30/-40%<br>Q/D.F. value:<br>NP0: Cap ≥ 30pF, Q ≥ 350; 10pF ≤ Cap < 30pF, Q ≥ 275+2.5C<br>Cap < 10pF; Q ≥ 200+10C<br>X7R/X5R:<br><table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>≥50V</td> <td>≤6%</td> <td>-</td> <td></td> </tr> <tr> <td>25V</td> <td>≤5%</td> <td>≤10%</td> <td>0201 ≥ 0.01µF</td> </tr> <tr> <td>16V</td> <td>≤5%</td> <td>≤15%</td> <td>0201 ≥ 0.01µF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤7.5%</td> <td>≤15%</td> <td>0201 ≥ 0.012µF</td> </tr> <tr> <td>≤20%</td> <td>0201 ≥ 0.1µF</td> </tr> <tr> <td>6.3V</td> <td>≤15%</td> <td>≤30%</td> <td>0201 ≥ 0.1µF</td> </tr> </tbody> </table> I.R.: ≥10V, ≥1GΩ or Rx C ≥ 50Ω-F whichever is smaller.<br>6.3V; 10V: 0201 ≥ 47nF, Rx C ≥ 10Ω-F | Rated vol. | D.F | Exception of D.F. |  | ≥50V | ≤6% | - |  | 25V | ≤5% | ≤10% | 0201 ≥ 0.01µF | 16V | ≤5% | ≤15% | 0201 ≥ 0.01µF | 10V | ≤7.5% | ≤15% | 0201 ≥ 0.012µF | ≤20% | 0201 ≥ 0.1µF | 6.3V | ≤15% | ≤30% | 0201 ≥ 0.1µF |
| Rated vol. | D.F                               | Exception of D.F.  |  |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
| ≥50V       | ≤6%                               | -  |  |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
| 25V        | ≤5%                               | ≤10%   | 0201 ≥ 0.01µF  |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
| 16V        | ≤5%                               | ≤15%   | 0201 ≥ 0.01µF  |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
| 10V        | ≤7.5%                             | ≤15%   | 0201 ≥ 0.012µF   |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
|            |                                   | ≤20%   | 0201 ≥ 0.1µF   |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |
| 6.3V       | ≤15%                              | ≤30%   | 0201 ≥ 0.1µF   |            |     |                   |  |      |     |   |  |     |     |      |               |     |     |      |               |     |       |      |                |      |              |      |      |      |              |

**Appendixes**

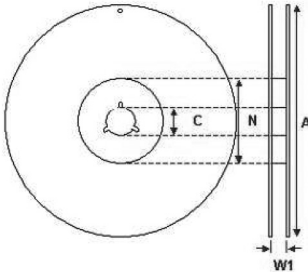
**Tape & Reel Dimensions**



The dimension of plastic tape

| Size              | 0201      |
|-------------------|-----------|
| <b>Thickness</b>  | <b>L</b>  |
| A <sub>0</sub>    | 0.38±0.05 |
| B <sub>0</sub>    | 0.68±0.05 |
| T                 | 0.42±0.05 |
| K <sub>0</sub>    | -         |
| W                 | 8.00±0.10 |
| P <sub>0</sub>    | 4.00±0.10 |
| 10xP <sub>0</sub> | 40.0±0.10 |
| P <sub>1</sub>    | 2.00±0.05 |
| P <sub>2</sub>    | 2.00±0.05 |
| D <sub>0</sub>    | 1.55±0.05 |
| D <sub>1</sub>    | -         |
| E                 | 1.75±0.05 |
| F                 | 3.50±0.05 |

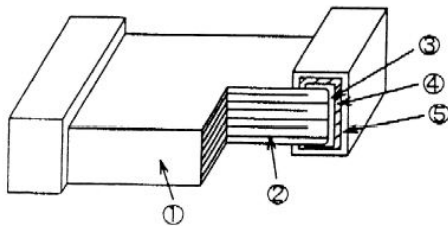
**Ultra-small Multilayer SMD Ceramic Capacitor  
0201 Size, NPO, X7R, X5R Dielectrics (6.3V to 50V)**



| Size      | 0201         |              |
|-----------|--------------|--------------|
| Reel size | 7"           | 13"          |
| C         | 13 +0.5/-0.2 | 13 +0.5/-0.2 |
| W1        | 8.4 +1.5/-0  | 8.4 +1.5/-0  |
| A         | 178 ±0.10    | 330 ±1       |
| N         | 60 +1/-0     | 100 ±1       |

The dimension of reel

**Constructions:**



| No. | Name             | NPO, X7R, Y5V            |
|-----|------------------|--------------------------|
| 1   | Ceramic material | BaTiO <sub>3</sub> based |
| 2   | Inner electrode  | Ni                       |
| 3   | Termination      | Inner layer              |
| 4   |                  | Middle layer             |
| 5   |                  | Outer layer              |
|     |                  | Sn (Matt)                |

**Storage and handling conditions**

- (1) To store products at 5°C to 40°C ambient temperature and 20 to 70% related humidity conditions.
- (2) The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

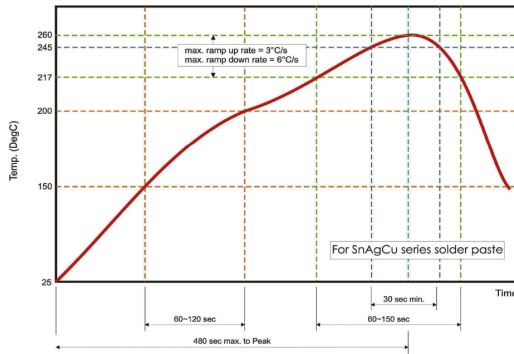
**Cautions:**

- a. The corrosive gas reacts on the terminal electrodes of capacitors, and results in the poor solderability. Do not store the capacitors in the ambience of corrosive gas (e.g., hydrogen sulfide, sulfur dioxide, chlorine, ammonia gas etc.)
- b. In corrosive atmosphere, solderability might be degraded, and silver migration might occur to cause low reliability.
- c. Due to the dewing by rapid humidity change, or the photochemical change of the terminal electrode by direct sunlight, the solderability and electrical performance may deteriorate. Do not store capacitors under direct sunlight or dewing condition. To store products on the shelf and avoid exposure to moisture.

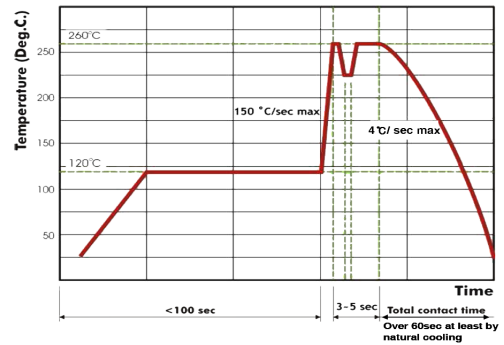


**Recommended Soldering Conditions:**

The lead-free termination MLCCs are not only to be used on SMT against lead-free solder paste, but also suitable against lead-containing solder paste. If the optimized solder joint is requested, increasing soldering time, temperature and concentration of N<sub>2</sub> within oven are recommended.



Recommended reflow soldering profile for SMT process with SnAgCu series solder paste.



Recommended wave soldering profile for SMT process with SnAgCu series solder.

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