

# Test Sheet of Chip Multilayer Ceramic Capacitor GRM15(1005M/0402) series [High Dielectric Type]



| Typical Murata Global Part No | Size (mm/inch) | Temp. Chara. | Cap.Value | Cap.Tol. | Volt. |
|-------------------------------|----------------|--------------|-----------|----------|-------|
| GRM155R60J106ME18             | 1005M/0402     | X5R          | 10uF      | +/-20%   | 6.3V  |

Data No.:QMC-GR2-0642  
DATE: 2021.9.2

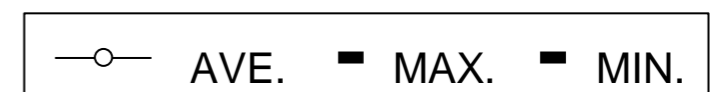
Murata Manufacturing Co., Ltd.

Operating Temperature Range / 使用温度範囲 : -55 ~ +85°C

| Tested Item/<br>試験項目                                  | Tested Condition/<br>試験条件  | Result/試験結果<br>(Rejection Number/Sample Number) |             |      |   |              |        |   |              |        |      |
|---|--|---|-------------|------|---|--------------|--------|---|--------------|--------|------|
| 1.Adhesive Strength of Termination/<br>固着性            | Substrate/基板 : Glass-epoxy<br>Pressurization Power / 加圧力 : 5N<br><br>Keeping Time / 保持時間 : 10±1s<br>Solder Type / はんだ種類 : Sn-3.0Ag-0.5Cu<br>Pressuring Speed/加圧速度 : 0.5 mm/sec (GRM03 : 0.1mm/sec)   | 0/10  |             |      |   |              |        |   |              |        |      |
| 2.Vibration/<br>振動                                    | Oscillation Frequency/振動周波数 : 10Hz to 55Hz to 10Hz for 1min.<br>Total Amplitude/全振幅 : 1.5 mm<br>Time/時間 : A period of 2 hours in each of 3 mutually perpendicular directions.<br>(Total 6 hours)   | 0/10  |             |      |   |              |        |   |              |        |      |
| 3.Substrate Bending test/<br>耐プリント板曲げ性                | Substrate/基板 : Glass-epoxy (100mm × 40mm × 1.6mm*)<br>* GRM03/15 : t=0.8mm<br><br>Deflection/たわみ量 : 1mm<br>Keeping Time/保持時間 : 5±1s<br>Pressure jig/加圧治具 : R5mm  | 0/10  |             |      |   |              |        |   |              |        |      |
| 4.Solderability/<br>はんだ付け性                            | Flux/フラックス : Ethanol solution of rosin 25(wt)%<br>Solder/はんだ : Sn-3.0Ag-0.5Cu<br>Solder Temperature/はんだ温度 : 245±5°C<br>Immersion Time/浸せき時間 : 2s±0.5s<br>Immersion Position/浸せき位置 : Covering terminal electrode<br>/ 端子電極が隠れるところまで。<br><br>Preheat/試験前予熱 : 80 to 120°C for 10-30 sec   | 0/10  |             |      |   |              |        |   |              |        |      |
| 5.Resistance to soldering Heat/<br>はんだ耐熱性             | Solder/はんだ : Sn-3.0Ag-0.5Cu<br>Solder Temperature/はんだ温度 : 270±5°C<br>Immersion Time/浸せき時間 : 10s±0.5s<br>Immersion Position/浸せき位置 : Covering terminal electrode<br>/ 端子電極が隠れるところまで。<br><br>Preheating/試験前予熱 : 120 to 150°C for 60 sec<br>*Preheating for GRM32/43/55<br><table border="1" data-bbox="499 1843 961 1941"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>100 to 120°C</td> <td>1 min.</td> </tr> <tr> <td>2</td> <td>170 to 200°C</td> <td>1 min.</td> </tr> </tbody> </table> | Step  | Temperature | Time | 1 | 100 to 120°C | 1 min. | 2 | 170 to 200°C | 1 min. | 0/10 |
| Step  | Temperature  | Time  |             |      |   |              |        |   |              |        |      |
| 1   | 100 to 120°C   | 1 min.  |             |      |   |              |        |   |              |        |      |
| 2   | 170 to 200°C   | 1 min.  |             |      |   |              |        |   |              |        |      |
| 6.Temperature Sudden Change/<br>温度急変                  | 1 Cycle condition/1サイクル条件<br>step 1: Min. Operating Temp.(+0°C,-3°C) , 30min±3min<br>step 2: Ordinary Temp.,2min to 3 min<br>step 3: Max. Operating Temp.(+3°C,-0°C) , 30min±3min<br>step 4: Ordinary Temp.,2min to 3 min<br>Cycle/回数 : 5 cycles   | 0/10  |             |      |   |              |        |   |              |        |      |
| 7.High Temperature High Humidity(Steady)/<br>高温高湿(定常) | Temperature/温度 : 40°C±2°C<br>Humidity/湿度 : 90%(RH) to 95%(RH)<br>Voltage/電圧 : The Rated Voltage/定格電圧<br>Time/時間 : 500±12h  | 0/10  |             |      |   |              |        |   |              |        |      |
| 8.Durability/<br>耐久性                                  | Temperature/温度 : Max. Operating Temp.±3°C<br>Voltage/電圧 : Apply 150% of the rated voltage / 定格電圧 x 150%<br>Time/時間 : 1000±12h  | 0/10  |             |      |   |              |        |   |              |        |      |

Note: These tested condition and specification are for the typical item.

| Typical Murata Global Part No | Size (mm/inch) | Temp. Chara. | Cap.Value | Cap.Tol. | Volt. |
|-------------------------------|----------------|--------------|-----------|----------|-------|
| GRM155R60J106ME18             | 1005M/0402     | X5R          | 10uF      | +/-20%   | 6.3V  |



| Tested Item/<br>試験項目                                 | Confirmed Criteria/<br>評価項目    | Specification and Result / 規格値 および 試験結果  |    |  |  |  |
|--|--------------------------------|--|----|--|--|--|
| 1.Adhesive Strength of Termination/ 固着性              | Appearance/外観                  | No defects including no peeling of the termination.<br>端子電極のはく離及びその他異常はありません。                  | OK |  |  |  |
| 2.Vibration/ 振動                                      | Appearance/外観                  | No defects / 著しい異常はありません。  | OK |  |  |  |
|  | Capacitance/ 静電容量              | 8 to 12uF  |    |  |  |  |
|  | D.F.                           | 0.1(max.)  |    |  |  |  |
| 3.Substrate Bending test/ 耐プリント板曲げ性                  | Appearance/外観                  | No defects / 著しい異常はありません。  | OK |  |  |  |
|  | Capacitance Change/ 静電容量変化率(%) | ±10% (within)  | OK |  |  |  |
| 4.Solderability / はんだ付け性                             | Wetting area/ はんだ付き面積          | 95% of the termination is to be soldered evenly and cotinuously./ 端子電極の95%以上に切れ目なくはんだが付着しています。 | OK |  |  |  |
| 5.Resistance to Soldering Heat/ はんだ耐熱性               | Appearance/外観                  | No defects / 著しい異常はありません。  | OK |  |  |  |
|  | Capacitance Change/ 静電容量変化率(%) | ±7.5% (within)   |    |  |  |  |
|  | D.F.                           | 0.1(max.)  |    |  |  |  |
|  | IR/絶縁抵抗(MΩ)                    | 5.0E+00(min.)  |    |  |  |  |
|  | Voltage Proof/ 耐電圧             | No defects/異常ありません。  | OK |  |  |  |
| 6.Temperature Sudden Change/ 温度急変                    | Appearance/外観                  | No defects / 著しい異常はありません。  | OK |  |  |  |
|  | Capacitance Change/ 静電容量変化率(%) | ±7.5% (within)   |    |  |  |  |
|  | D.F.                           | 0.1(max.)  |    |  |  |  |
|  | IR/絶縁抵抗(MΩ)                    | 5.0E+00(min.)  |    |  |  |  |
|  | Voltage Proof/ 耐電圧             | No defects/異常ありません。  | OK |  |  |  |
| 7.High Temperature High Humidity (Steady)/ 高温高湿 (定常) | Appearance/外観                  | No defects / 著しい異常はありません。  | OK |  |  |  |
|  | Capacitance Change/ 静電容量変化率(%) | ±12.5% (within)  |    |  |  |  |
|  | D.F.                           | 0.2(max.)  |    |  |  |  |
|  | IR/絶縁抵抗(MΩ)                    | 1.3E+00(min.)  |    |  |  |  |
| 8.Durability/ 耐久性                                    | Appearance/外観                  | No defects / 著しい異常はありません。  | OK |  |  |  |
|  | Capacitance Change/ 静電容量変化率(%) | ±12.5% (within)  |    |  |  |  |
|  | D.F.                           | 0.2(max.)  |    |  |  |  |
|  | IR/絶縁抵抗(MΩ)                    | 2.5E+00(min.)  |    |  |  |  |