

Test Sheet of Monolithic Ceramic Capacitor GRM18(0603/1608) series [High Dielectric Type]

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Murata Manufacturing Co., Ltd.

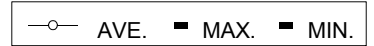
| Typical Murata Global Part No | Size (inch/mm) | Temp. Chara. | Cap.Value | Cap.Tol. | Volt. |
|-------------------------------|----------------|--------------|-----------|----------|-------|
| GRM188C80G226ME15 | 0603/1608 | X6S | 22uF | +/-20% | 4V |

Operating Temperature Range / 使用温度範囲: -55 ~ +105°C

| Tested Item/ 試験項目 | Tested Condition/ 試験条件 | Result/試験結果 (Rejection Number/Sample Number) | | | | | | | | | |
|---|---|---|-------------|------|---|--------------|--------|---|--------------|--------|------|
| 1.Adhesive Strength of Termination/ 固着性 | Substrate/基板: Glass-epoxy Pressurization Power / 加圧力: 10N (GRM03: 2N / GRM15,18: 5N) Keeping Time / 保持時間: 10±1s Solder Type / はんだ種類: Sn-3.0Ag-0.5Cu Pressuring Speed/加圧速度: 0.5 mm/sec (GRM03: 0.1mm/sec) | 0/10 | | | | | | | | | |
| 2.Vibration/ 振動 | Oscillation Frequency/振動周波数: 10Hz to 55Hz to 10Hz for 1min. Total Amplitude/全振幅: 1.5 mm Time/時間: A period of 2 hours in each of 3 mutually perpendicular directions. (Total 6 hours) | 0/10 | | | | | | | | | |
| 3.Substrate Bending test/ 耐ﾌﾟﾘﾝﾄ板曲げ性 | Substrate/基板: Glass-epoxy (100mm × 40mm × 1.6mm*) * (t=GRM03/15: 0.8mm) Deflection/たわみ量: 1mm Keeping Time/保持時間: 5±1s Pressure jig/加圧治具: R5mm | 0/10 | | | | | | | | | |
| 4.Solderability/ はんだ付け性 | Flux/フラックス: Ethanol solution of rosin 25(wt)% Solder/はんだ: Sn-3.0Ag-0.5Cu Solder Temperature/はんだ温度: 245±5°C Immersion Time/浸せき時間: 2s±0.5s Immersion Position/浸せき位置: Covering terminal electrode / 端子電極が隠れるところまで。 Preheat/試験前予熱: 80 to 120°C for 10-30 sec | 0/10 | | | | | | | | | |
| 5.Resistance to soldering Heat/ はんだ耐熱性 | Solder/はんだ: Sn-3.0Ag-0.5Cu Solder Temperature/はんだ温度: 270±5°C Immersion Time/浸せき時間: 10s±0.5s Immersion Position/浸せき位置: Covering terminal electrode / 端子電極が隠れるところまで。 Preheating/試験前予熱: 120 to 150°C for 60 sec *Preheating for GRM32/43/55 <table border="1" data-bbox="371 1413 683 1485"> <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/ 温度急変 | 1 Cycle condition/1サイクル条件 step 1: Min. Operating Temp.(+0°C,-3°C), 30min±3min step 2: Ordinary Temp.,2min to 3 min step 3: Max. Operating Temp.(+3°C,-0°C), 30min±3min step 4: Ordinary Temp.,2min to 3 min Cycle/回数: 5 cycles | 0/10 | | | | | | | | | |
| 7.High Temperature High Humidity(Steady)/ 高温高湿(定常) | Temperature/温度: 40°C±2°C Humidity/湿度: 90%(RH) to 95%(RH) Voltage/電圧: The Rated Voltage/定格電圧 Time/時間: 500±12h | 0/10 | | | | | | | | | |
| 8.Durability/ 耐久性 | Temperature/温度: Max. Operating Temp.±3°C Voltage/電圧: Apply 150% of the rated voltage / 定格電圧 x 150% Time/時間: 1000±12h | 0/10 | | | | | | | | | |

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

| Typical Murata Global Part No | Size (inch/mm) | Temp. Chara. | Cap.Value | Cap.Tol. | Volt. |
|-------------------------------|----------------|--------------|-----------|----------|-------|
| GRM188C80G226ME15 | 0603/1608 | X6S | 22uF | +/-20% | 4V |



| Tested Item/ 試験項目 | Confirmed Criteria/ 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. 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 | 17.6 to 26.4uF | | | | |
| | D.F. | 0.1(max.) | | | | |
| 3.Substrate Bending test/ 耐ﾌﾟﾘﾝﾄ板曲げ性 | 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 continuously/ 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(%) | ±15% (within) | | | | |
| | D.F. | 0.1(max.) | | | | |
| | IR/絶縁抵抗(MΩ) | 2.3E+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) | 2.3E+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) | 5.7E-01(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) | 1.1E+00(min.) | | | | |