



SPECIFICATION

(Reference sheet)

• Supplier : Samsung electro-mechanics • Samsung P/N : CL10Y104MR5NJND

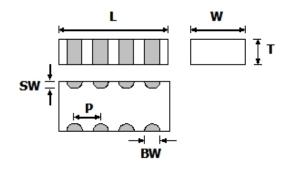
• Product : Multi-layer Ceramic Capacitor • Description : CAP, 100 nF, 4V, ±20%, X7S, 0603

A. Samsung Part Number

<u>CL</u> <u>10</u> <u>Y</u> <u>104</u> <u>M</u> <u>R</u> <u>5</u> <u>N</u> <u>J</u> <u>N</u> <u>D</u> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

| 1 | Series | Samsung Multi-layer Ceramic Capacitor | | | | | |
|---|---------------|---------------------------------------|-------------------|-------------------------------|--|--|--|
| 2 | Size | 0603 (inch code) | L: 1.60 ± 0.10 mm | W: $0.80 \pm 0.10 \text{ mm}$ | | | |
| 3 | Dielectric | X7S | Inner electrode | Ni | | | |
| 4 | Capacitance | 100 nF | Termination | Cu | | | |
| ⑤ | Capacitance | ±20 % | Plating | Sn 100% (Pb Free) | | | |
| | tolerance | | 9 Product | SLIC | | | |
| 6 | Rated Voltage | 4 V | Special | Reserved for future use | | | |
| 7 | Thickness | 0.50 +0.05/-0.1 mm | ① Packaging | Cardboard Type, 13" reel | | | |

B. Structure and Dimensions



| Samsung P/N | Dimension(mm) | | | | | |
|-----------------|---------------|-----------|----------------|-----------|-----------|-----------|
| Samsung F/N | L | W | Т | BW | SW | Р |
| CL10Y104MR5NJND | 1.60±0.10 | 0.80±0.10 | 0.5 +0.05/-0.1 | 0.25±0.10 | 0.15±0.10 | 0.40±0.10 |

C. Samsung Reliablility Test and Judgement Condition

| Insulation 10,000Mohm or 50Mohm×μF Rated Voltage 60~120 sec. Resistance Whichever is smaller Appearance No abnormal exterior appearance Microscope (×10) Withstanding No delectric breakdown or mechanical breakdown 250% of the rated voltage Voltage Temperature X7S Characteristics (From -55℃ to 125℃, Capacitance change should be within ±22%) Adhesive Strength of Termination No peeling shall be occur on the terminal electrode 500g·F, for 10±1 sec. Bending Strength Capacitance change : within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu.0.5 solder 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.) Resistance to Soldering heat Capacitance change : within ±7.5% Solder pot : 270±5℃, 10±1sec. Soldering heat Tan δ, IR : initial spec. Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z) Wibration Test Capacitance change : within ±12.5% With rated voltage Resistance Tan δ : 0.2 max IR : 500Mohm or 12.5Mohm × μF Whichever is smaller With 150% of the rated voltage High Temperature Capacitance change : within ±12.5% Within ±12.5% With 150% of the rated volta | | Judgement | Test condition | | | |
|---|-------------------|---|--|--|--|--|
| Insulation 10,000Mohm or 50Mohm×μF Rated Voltage 60~120 sec. | Capacitance | Within specified tolerance | 1kHz ±10% / 0.5±0.1Vrms | | | |
| Resistance Whichever is smaller Microscope (×10) Appearance No abnormal exterior appearance Microscope (×10) Withstanding No dielectric breakdown or mechanical breakdown 250% of the rated voltage Temperature X7S Characteristics (From -55℃ to 125℃, Capacitance change should be within ±22%) Adhesive Strength No peeling shall be occur on the terminal electrode 500g·F, for 10±1 sec. Bending Strength Capacitance change: within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating: 80~120℃ for 10~30sec.) Resistance to Capacitance change: within ±7.5% Solder pot: 270±5℃, 10±1sec. Soldering heat Tan δ, IR: initial spec. Amplitude: 1.5mm Vibration Test Capacitance change: within ±20% Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change: within ±12.5% With rated voltage 40±2 ℂ, 90~95%RH, 500+12/-0hrs Resistance Tan δ: 0.2 max Within ±12.5% With 150% of the rated voltage Max. operating temperature Hi | Tan δ (DF) | 0.12 max. | | | | |
| Appearance No abnormal exterior appearance Microscope (×10) Withstanding No dielectric breakdown or mechanical breakdown 250% of the rated voltage Temperature X7S Characteristics (From -55°C to 125°C, Capacitance change should be within ±22%) Adhesive Strength of Termination No peeling shall be occur on the terminal electrode 500g·F, for 10±1 sec. Bending Strength Capacitance change: within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating: 80~120°C for 10~30sec.) Resistance to Capacitance change: within ±7.5% Solder pot: 270±5°C, 10±1sec. Soldering heat Tan δ, IR: initial spec. Solder pot: 270±5°C, 10±1sec. Vibration Test Capacitance change: within ±20% Tan δ, IR: initial spec. Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change: within ±12.5% With rated voltage With rated voltage 40±2°C, 90~95%RH, 500+12/-0hrs High Temperature Capacitance change: within ±12.5% With 150% of the rated voltage Max. operating temperature Resistance Tan δ: 0.2 max IR: 1,000Mohm or 25Mohm × μF | Insulation | 10,000Mohm or 50Mohm× <i>μ</i> F | Rated Voltage 60~120 sec. | | | |
| Withstanding No dielectric breakdown 250% of the rated voltage Voltage mechanical breakdown 250% of the rated voltage Temperature X7S Characteristics (From -55℃ to 125℃, Capacitance change should be within ±22%) Adhesive Strength of Termination No peeling shall be occur on the terminal electrode 500g-F, for 10±1 sec. Bending Strength Capacitance change: within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating: 80~120℃ for 10~30sec.) Resistance to Capacitance change: within ±7.5% Solder pot: 270±5℃, 10±1sec. Soldering heat Tan δ, IR: initial spec. Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change: within ±12.5% With rated voltage Resistance Tan δ: 0.2 max With 150% of the rated voltage IR: 500Mohm or 12.5Mohm × μF With 150% of the rated voltage Max. operating temperature Max. operating temperature IR: 1,000Mohm or 25Mohm × μF 1,000+48/-0hrs | Resistance | Whichever is smaller | | | | |
| Voltage mechanical breakdown Temperature X7S Characteristics (From -55°C to 125°C, Capacitance change should be within ±22%) Adhesive Strength of Termination No peeling shall be occur on the terminal electrode 500g·F, for 10±1 sec. Bending Strength Capacitance change: within ±12.5% with 1.0mm/sec. Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating: 80~120°C for 10~30sec.) Resistance to Soldering heat Capacitance change: within ±7.5% Solder pot: 270±5°C, 10±1sec. Vibration Test Capacitance change: within ±20% Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change: within ±12.5% With rated voltage With rated voltage Resistance Tan δ: 0.2 max IR: 500Mohm or 12.5Mohm × μF Whichever is smaller With 150% of the rated voltage Max. operating temperature High Temperature Capacitance change: within ±12.5% Amount in the properature IR: 1,000Mohm or 25Mohm × μF With 150% of the rated voltage Max. operating temperature | Appearance | No abnormal exterior appearance | Microscope (×10) | | | |
| Temperature Characteristics (From -55°C to 125°C, Capacitance change should be within ±22%) Adhesive Strength of Termination Bending Strength Capacitance change: within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly Capacitance change: within ±7.5% Solder pot: 270±5°C, 10±1sec. (preheating: 80~120°C for 10~30sec.) Resistance to Capacitance change: within ±20% Tan δ, IR: initial spec. Vibration Test Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±12.5% Tan δ, IR: initial spec. Capacitance change: within ±12.5% Tan δ (22 max Tan δ) (22 max Tan δ) (23 max Tan δ) (23 max Tan δ) (24 max Tan δ) (24 max Tan δ) (25 max Tan δ | Withstanding | No dielectric breakdown or | 250% of the rated voltage | | | |
| Characteristics (From -55 ℃ to 125 ℃, Capacitance change should be within ±22%) Adhesive Strength of Termination No peeling shall be occur on the terminal electrode 500g·F, for 10±1 sec. Bending Strength Capacitance change : within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5 ℃, 3±0.3sec. (preheating : 80~120 ℃ for 10~30sec.) Resistance to Capacitance change : within ±7.5% Solder pot : 270±5 ℃, 10±1sec. Soldering heat Tan δ, IR : initial spec. Amplitude : 1.5mm Vibration Test Capacitance change : within ±20% Tan δ, IR : initial spec. Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change : within ±12.5% With rated voltage With rated voltage 40±2 ℃, 90~95%RH, 500+12/-0hrs Resistance Tan δ : 0.2 max IR : 500Mohm or 12.5Mohm × μF Whichever is smaller With 150% of the rated voltage Max. operating temperature IR : 1,000Hohm or 25Mohm × μF Mith 150% of the rated voltage Max. operating temperature IR : 1,000+48/-0hrs | Voltage | mechanical breakdown | | | | |
| Adhesive Strength of TerminationNo peeling shall be occur on the terminal electrode500g·F, for 10±1 sec.Bending StrengthCapacitance change : within ±12.5%Bending to the limit (1mm) with 1.0mm/sec.SolderabilityMore than 75% of terminal surface is to be soldered newlySnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating : 80~120°C for 10~30sec.)Resistance toCapacitance change : within ±7.5%Solder pot : 270±5°C, 10±1sec.Soldering heatTan δ, IR : initial spec.Amplitude : 1.5mmVibration TestCapacitance change : within ±20% Tan δ, IR : initial spec.Amplitude : 1.5mmFrom 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)MoistureCapacitance change : within ±12.5% Whichever is smallerWith rated voltage 40±2°C, 90~95%RH, 500+12/-0hrsHigh Temperature ResistanceCapacitance change : within ±12.5% Whichever is smallerWith 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs | Temperature | X7S | | | | |
| of Termination terminal electrode Bending Strength Capacitance change: within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating: 80~120°C for 10~30sec.) Resistance to Capacitance change: within ±7.5% Solder pot: 270±5°C, 10±1sec. Soldering heat Tan δ, IR: initial spec. Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) Prom 10Hz to 55Hz (return: 1min.) 2 bours × 3 direction (x, y, z) Moisture Capacitance change: within ±12.5% With rated voltage Resistance Tan δ: 0.2 max Within ±2.5% With 150% of the rated voltage High Temperature Capacitance change: within ±12.5% With 150% of the rated voltage Max. operating temperature Resistance Tan δ: 0.2 max Within ±12.5% With 150% of the rated voltage Max. operating temperature Tan δ: 0.2 max Max. operating temperature 1,000+48/-0hrs | Characteristics | (From -55℃ to 125℃, Capacitance change should be within ±22%) | | | | |
| Bending Strength Capacitance change : within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.) Resistance to Soldering heat Capacitance change : within ±7.5% Solder pot : 270±5℃, 10±1sec. Vibration Test Capacitance change : within ±20% Tan δ, IR : initial spec. Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change : within ±12.5% With rated voltage 40±2℃, 90~95%RH, 500+12/-0hrs Resistance Tan δ : 0.2 max Whichever is smaller With 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs High Temperature Resistance Capacitance change : within ±12.5% Max. operating temperature 1,000+48/-0hrs Max. operating temperature 1,000+48/-0hrs | Adhesive Strength | No peeling shall be occur on the | 500g·F, for 10±1 sec. | | | |
| With 1.0mm/sec. Solderability More than 75% of terminal surface is to be soldered newly SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.) Resistance to Soldering heat Capacitance change : within ±7.5% Tan δ, IR : initial spec. Solder pot : 270±5℃, 10±1sec. Vibration Test Capacitance change : within ±20% Tan δ, IR : initial spec. Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change : within ±12.5% Tan δ : 0.2 max IR : 500Mohm or 12.5Mohm × μF Whichever is smaller With rated voltage 40±2℃, 90~95%RH, 500+12/-0hrs High Temperature Capacitance change : within ±12.5% With 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs Resistance Tan δ : 0.2 max IR : 1,000Mohm or 25Mohm × μF With 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs | of Termination | terminal electrode | | | | |
| Solderability More than 75% of terminal surface is to be soldered newly Capacitance change: within $\pm 7.5\%$ Solder pot: 270 ± 5 °C, 10 ± 1 sec. Soldering heat Vibration Test Capacitance change: within $\pm 20\%$ Tan δ , IR: initial spec. Capacitance change: within $\pm 20\%$ Tan δ , IR: initial spec. Capacitance change: within $\pm 20\%$ Tan δ , IR: initial spec. Capacitance change: within $\pm 12.5\%$ Resistance Capacitance change: within $\pm 12.5\%$ Resistance Tan δ : 0.2 max IR: 500Mohm or 12.5Mohm × μ F Whichever is smaller Capacitance change: within $\pm 12.5\%$ With 150% of the rated voltage Tan δ : 0.2 max IR: 1,000Mohm or 25Mohm × μ F Max. operating temperature Resistance Tan δ : 1,000Mohm or 25Mohm × μ F IR: 1,000Hohm or 25Mohm × μ F Tan δ : 1,000Hohm or 25Mohm × μ F Tan δ : 1,000Hohm or 25Mohm × μ F Tan δ : 1,000Hohm or 25Mohm × μ F | Bending Strength | Capacitance change: within ±12.5% | Bending to the limit (1mm) | | | |
| is to be soldered newly $ 245\pm5^{\circ}\text{C}, 3\pm0.3\text{sec.} \\ \text{(preheating: 80~120^{\circ}\text{C for }10~30\text{sec.})} $ Resistance to $ \text{Soldering heat} $ Capacitance change: within $\pm7.5\%$ Solder pot: $270\pm5^{\circ}\text{C}, 10\pm1\text{sec.} $ Soldering heat $ \text{Tan }\delta, \text{IR: initial spec.} $ Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours \times 3 direction (x, y, z) $ \text{Moisture} $ Capacitance change: within $\pm12.5\%$ Resistance $ \text{Tan }\delta: 0.2 \text{ max} $ IR: $500\text{Mohm or }12.5\text{Mohm} \times \mu\text{F} $ Whichever is smaller $ \text{Resistance} $ Capacitance change: within $\pm12.5\%$ With 150% of the rated voltage Max. operating temperature IR: $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ Max. operating temperature $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ In $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm or }25\text{Mohm} \times \mu\text{F} $ The solution of $1,000\text{Mohm} \times \mu\text{F} \times \mu\text{F} \times \mu\text{Mohm} \times \mu\text{F} \times \mu\text{F} \times \mu\text{F} \times \mu\text{F} \times \mu\text{F} \times \mu\text{F} \times \mu\text$ | | | with 1.0mm/sec. | | | |
| Resistance to Capacitance change : within $\pm 7.5\%$ Solder pot : 270 ± 5 °C, 10 ± 1 sec. Vibration Test Capacitance change : within $\pm 20\%$ Tan δ , IR : initial spec. Vibration Test Capacitance change : within $\pm 20\%$ Tan δ , IR : initial spec. Moisture Capacitance change : within $\pm 12.5\%$ Resistance Tan δ : 0.2 max IR : 500 Mohm or 12.5 Mohm × μ F Whichever is smaller High Temperature Resistance Tan δ : 0.2 max IR : | Solderability | More than 75% of terminal surface | SnAg3.0Cu0.5 solder | | | |
| Resistance to Soldering heat Vibration Test Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±20% Tan δ, IR: initial spec. Capacitance change: within ±12.5% Tan δ: 0.2 max IR: 500Mohm or 12.5Mohm × μF Whichever is smaller Capacitance change: within ±12.5% With rated voltage 40±2°C, 90~95%RH, 500+12/-0hrs With 150% of the rated voltage Tan δ: 0.2 max IR: 1,000Mohm or 25Mohm × μF IR: 1,000Hohm or 25Mohm × μF | | is to be soldered newly | 245±5℃, 3±0.3sec. | | | |
| Soldering heatTan δ, IR : initial spec.Amplitude : 1.5mmVibration TestCapacitance change : within ±20% Tan δ, IR : initial spec.Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)MoistureCapacitance change : within ±12.5% Tan δ : 0.2 max IR : 500Mohm or 12.5Mohm × μ F Whichever is smallerWith rated voltage 40±2 °C, 90~95%RH, 500+12/-0hrsHigh TemperatureCapacitance change : within ±12.5% With 150% of the rated voltage Max. operating temperature IR : 1,000Mohm or 25Mohm × μ FWith 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs | | | (preheating : 80~120 ℃ for 10~30sec.) | | | |
| Soldering heatTan δ, IR : initial spec.Amplitude : 1.5mmVibration TestCapacitance change : within ±20% Tan δ, IR : initial spec.Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)MoistureCapacitance change : within ±12.5% Tan δ : 0.2 max IR : 500Mohm or 12.5Mohm × μ F Whichever is smallerWith rated voltage 40±2 °C, 90~95%RH, 500+12/-0hrsHigh TemperatureCapacitance change : within ±12.5% With 150% of the rated voltage Max. operating temperature IR : 1,000Mohm or 25Mohm × μ FWith 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs | | | | | | |
| Vibration TestCapacitance change : within ±20% Tan δ, IR : initial spec.Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)MoistureCapacitance change : within ±12.5% Tan δ : 0.2 max IR : 500Mohm or 12.5Mohm × μ F Whichever is smallerWith rated voltage 40±2°C, 90~95%RH, 500+12/-0hrsHigh Temperature ResistanceCapacitance change : within ±12.5% With 150% of the rated voltage Max. operating temperature IR : 1,000Mohm or 25Mohm × μ FWith 150% of the rated voltage Max. operating temperature | Resistance to | Capacitance change : within ±7.5% | Solder pot : 270±5℃, 10±1sec. | | | |
| Tan δ , IR: initial spec. From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change: within $\pm 12.5\%$ With rated voltage $\pm 40\pm 2^{\circ}\mathrm{C}$, $\pm 90^{\circ}\mathrm{95\%RH}$, $\pm 500\mathrm{Mohm}$ or $\pm 12.5\mathrm{Mohm}$ × $\pm 12.5\mathrm{Mohm}$ With $\pm 12.5\mathrm{Mohm}$ of the rated voltage $\pm 12.5\mathrm{Mohm}$ Resistance Capacitance change: within $\pm 12.5\mathrm{Mohm}$ With $\pm 150\mathrm{Mohm}$ of the rated voltage $\pm 12.5\mathrm{Mohm}$ Max. operating temperature $\pm 12.5\mathrm{Mohm}$ IR: $\pm 12.5\mathrm{Mohm}$ × $\pm 12.5\mathrm{Mohm}$ × $\pm 12.5\mathrm{Mohm}$ × $\pm 12.5\mathrm{Mohm}$ × $\pm 12.5\mathrm{Mohm}$ Max. operating temperature $\pm 12.5\mathrm{Mohm}$ 1,000+48/-0hrs | Soldering heat | Tan δ, IR : initial spec. | | | | |
| MoistureCapacitance change : within $\pm 12.5\%$ With rated voltageResistanceTan δ : 0.2 max40 $\pm 2^{\circ}$ C, 90~95%RH, 500+12/-0hrsIR : 500Mohm or 12.5Mohm × μ F Whichever is smallerWith 150% of the rated voltageHigh TemperatureCapacitance change : within $\pm 12.5\%$ With 150% of the rated voltageResistanceTan δ : 0.2 maxMax. operating temperatureIR : 1,000Mohm or 25Mohm × μ F1,000+48/-0hrs | Vibration Test | Capacitance change : within ±20% | Amplitude : 1.5mm | | | |
| MoistureCapacitance change : within $\pm 12.5\%$ With rated voltageResistanceTan δ : 0.2 max $40\pm 2^{\circ}$ C, $90\sim 95\%$ RH, 500 ± 12 /-0hrsIR : 500Mohm or 12.5Mohm × μ F Whichever is smallerWith 150% of the rated voltageHigh TemperatureCapacitance change : within $\pm 12.5\%$ With 150% of the rated voltageResistanceTan δ : 0.2 maxMax. operating temperatureIR : 1,000Mohm or 25Mohm × μ F1,000+48/-0hrs | | Tan δ, IR : initial spec. | From 10Hz to 55Hz (return : 1min.) | | | |
| ResistanceTan δ : 0.2 max 40 ± 2 °C, 90~95%RH, 500+12/-0hrsIR : 500Mohm or 12.5Mohm × μ F Whichever is smallerWhichever is smallerHigh Temperature ResistanceCapacitance change : within $\pm 12.5\%$ Tan δ : 0.2 max IR : 1,000Mohm or 25Mohm × μ FWith 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs | | | 2hours × 3 direction (x, y, z) | | | |
| IR : 500Mohm or 12.5Mohm × μ F | Moisture | Capacitance change : within ±12.5% | With rated voltage | | | |
| | Resistance | Tan δ : 0.2 max | 40±2℃, 90~95%RH, 500+12/-0hrs | | | |
| High TemperatureCapacitance change : within ±12.5%With 150% of the rated voltageResistanceTan δ : 0.2 maxMax. operating temperatureIR : 1,000Mohm or 25Mohm × μ F1,000+48/-0hrs | | IR : 500Mohm or 12.5Mohm × μ F | | | | |
| ResistanceTan δ : 0.2 maxMax. operating temperatureIR : 1,000Mohm or 25Mohm × μF1,000+48/-0hrs | | Whichever is smaller | | | | |
| IR : 1,000Mohm or 25Mohm × μF 1,000+48/-0hrs | High Temperature | Capacitance change : within ±12.5% | With 150% of the rated voltage | | | |
| | Resistance | Tan δ : 0.2 max | Max. operating temperature | | | |
| Whichever is smaller | | IR : 1,000Mohm or 25Mohm × μ F | 1,000+48/-0hrs | | | |
| | | Whichever is smaller | | | | |
| Temperature Capacitance change: within ±12.5% 1 cycle condition | Temperature | Capacitance change : within ±12.5% | 1 cycle condition | | | |
| CyclingTan δ , IR : initial spec.Min. operating temperature \rightarrow 25 $^{\circ}$ C | Cycling | Tan δ, IR : initial spec. | Min. operating temperature $ ightarrow$ 25 $^{\circ}$ C | | | |
| → Max. operating temperature → 25 °C | | | $ ightarrow$ Max. operating temperature $ ightarrow$ 25 $^{\circ}\!$ | | | |
| | | | | | | |
| 5 cycle test | | | 5 cycle test | | | |

X The reliability test condition can be replaced by the corresponding accelerated test condition.

D. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260±5 °C, 30sec.)



Product specifications included in the specifications are effective as of March 1, 2013.

Please be advised that they are standard product specifications for reference only.

We may change, modify or discontinue the product specifications without notice at any time.

So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,

please contact our sales personnel or application engineers.

- Caution of Application -

Disclaimer

The products listed as follows are NOT designed and manufactured for any use and applications set forth below.

Please note that any misuse of the products deviating from products specifications or information provided in this Spec sheet may cause serious property damages or personal injury.

- 1) Aerospace/Aviation equipment
- 2 Automotive of Transportation equipment (vehicles, trains, ships, etc)
- 3 Military equipment
- 4) Atomic energy-related equipment
- **5** Undersea equipment
- (f) Any other applications with the same as or similar complexity or reliability to the applications

Limitation

Please contact us with usage environment information such as voltage, current, temperature, or other special conditions before using our products for the applications listed below. The below application conditions require especially high reliability products to prevent defects that may directly cause damages or loss to third party's life, body or property.

If you have any questions regarding this 'Limitation', you should first contact our sales personnel or application engineers.

- ① Medical equipment
- 2 Disaster prevention/crime prevention equipment
- 3 Power plant control equipment
- 4 Traffic signal equipment
- 5 Data-processing equipment
- 6 Electric heating apparatus, burning equipment
- Safety equipment
- ® Any other applications with the same as or similar complexity or reliability to the applications