

■ Standard Testing Conditions

<Unless otherwise specified>

Temperature: Ordinary Temp. 15 to 35°C
Humidity: Ordinary Humidity 25 to 85%(RH)

<In case of doubt>

Temperature: 20±2°C
Humidity: 60 to 70%(RH)
Atmospheric pressure: 86 to 106kPa


■ Specifications

1. Electrical Performance

| No. | Item | Specification | Test Method |
|-----|------------------------------|---------------------------------------|---|
| 1 | Withstand Voltage | Products shall not be damaged. | Voltage: Rated Voltage x 250% (ref.item 4) Time: 1 to 5s Measuring Current: 10mA max. |
| 2 | Insulation Resistance (I.R.) | 10MΩ min. | Voltage: Rated Voltage (ref.item 4) Time: 30s max. Measuring Current: 10mA max. Measuring Equipment: Agilent 4339A or the equivalent |
| 3 | DC Resistance (Rdc) | Meet the initial value specification. | Measuring Method: four-terminal method (ref.item 4) |
| 4 | Inductance (L) | Meet the initial value specification. | Measuring Frequency: 1±0.1kHz (ref.item 4) Voltage: 1V (rms) max. Measuring Equipment: Agilent 4278A or the equivalent |

2. Mechanical Performance

| No. | Item | Specification | Test Method | | | | | | | | |
|------------------------------|---------------------------------------|--|---|-----------|-------------------------|-------------|------------------------------|-----------|-------------------|--------------------------------|---|
| 1 | Appearance and Dimensions | Meet dimensions. | Visual Inspection and measured with Slide Calipers. | | | | | | | | |
| 2 | Marking | Marking on the product can be read. | Visual Inspection | | | | | | | | |
| 3 | Solderability | The electrodes shall be at least 90% covered with new solder coating. | Flux: Ethanol solution of rosin, 25(wt)% Solder: Sn-3.0Ag-0.5Cu Pre-heating: 150±10°C, 60s Solder Temperature: 245±5°C Immersion Time: 3s±1s Immersion Direction: electrode direction is downward Immersion Depth: up to top of electrode Immersion and Emersion Rates: 25mm/s | | | | | | | | |
| 4 | Resistance to Soldering Heat (Reflow) | Meet Table 1. | Solder: Sn-3.0Ag-0.5Cu Pre-heating: 150 to 180°C, 90±30s Heating: above 230°C, 60s max. Peak: 260°C, 10s Reflow Times: 2 times Then measured after exposure in the room condition for 48±4h. | | | | | | | | |
| 5 | Vibration | <table border="1"> <tr> <td>Appearance</td> <td>No damage</td> </tr> <tr> <td>Inductance Change (%ΔL)</td> <td>within ±15%</td> </tr> <tr> <td>Insulation Resistance (I.R.)</td> <td>10MΩ min.</td> </tr> <tr> <td>Withstand Voltage</td> <td>Products shall not be damaged.</td> </tr> </table> | Appearance | No damage | Inductance Change (%ΔL) | within ±15% | Insulation Resistance (I.R.) | 10MΩ min. | Withstand Voltage | Products shall not be damaged. | It shall be soldered on the substrate. Oscillation Frequency: 10Hz to 2000Hz to 10Hz for 20 min. Total Amplitude: 3.0mm or Acceleration amplitude 196 m/s ² whichever is smaller. Testing Time: A period of 4 hours in each of 3 mutually perpendicular directions. (Total 12h) |
| Appearance | No damage | | | | | | | | | | |
| Inductance Change (%ΔL) | within ±15% | | | | | | | | | | |
| Insulation Resistance (I.R.) | 10MΩ min. | | | | | | | | | | |
| Withstand Voltage | Products shall not be damaged. | | | | | | | | | | |
| 6 | Shock | | It shall be soldered on the substrate. Peak Acceleration: 14,700 m/s ² Normal Duration: 0.5 ms Wave Form: Half-sine wave Times: 3 shocks in each 6 directions (total 18 times) | | | | | | | | |

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3. Environmental Performance (It shall be soldered on the substrate.)

| No. | Item | Specification | Test Method | | | | | | | | |
|------------------------------|--------------------------------|--|---|-----------|-------------------------|-------------|------------------------------|-----------|-------------------|--------------------------------|--|
| 1 | Heat Shock | Meet Table 2. Table 2 | 1 cycle: 1 step: -55°C(+0°C, -3°C) / 30min(+3min, -0min) 2 step: Maximum Operating Temperature (+3°C, -0°C) / 30min (+3min, -0min) Total of 1000 cycles Then measured after exposure in the room condition for 48±4h. | | | | | | | | |
| 2 | Humidity Life | <table border="1"> <tr> <td>Appearance</td> <td>No damage</td> </tr> <tr> <td>Inductance Change (%ΔL)</td> <td>within ±20%</td> </tr> <tr> <td>Insulation Resistance (I.R.)</td> <td>10MΩ min.</td> </tr> <tr> <td>Withstand Voltage</td> <td>Products shall not be damaged.</td> </tr> </table> | Appearance | No damage | Inductance Change (%ΔL) | within ±20% | Insulation Resistance (I.R.) | 10MΩ min. | Withstand Voltage | Products shall not be damaged. | Temperature: 85±2°C Humidity: 80 to 85%(RH) Voltage: Rated Voltage Time: 1000+48/-0h Then measured after exposure in the room condition for 48±4h. |
| Appearance | No damage | | | | | | | | | | |
| Inductance Change (%ΔL) | within ±20% | | | | | | | | | | |
| Insulation Resistance (I.R.) | 10MΩ min. | | | | | | | | | | |
| Withstand Voltage | Products shall not be damaged. | | | | | | | | | | |
| 3 | Heat Life | | Temperature: Maximum Operating Temperature ±2°C Voltage: Rated Voltage x 200% Time: 1000+48/-0h Then measured after exposure in the room condition for 48±4h. | | | | | | | | |

4. Measuring Terminal (When measuring and supplying the voltage, the following terminal is applied.)

| No. | Item | Measuring Terminal |
|-----|---|--------------------|
| 1 | Inductance (L) DC Resistance (Rdc) | |
| 2 | Withstand Voltage Insulation Resistance (I.R.) Humidity Life Heat Life | |
| 3 | Common Mode Impedance (Zc) | |

■ Measuring Method for Common Mode Impedance

Measured common mode impedance may be included measurement error due to stray capacitance, residual inductance of test fixture.

To correct this error, the common mode impedance should be calculate as follows;

- (1) Measure admittance of the fixture (opened), G_o B_o .
- (2) Measure impedance of the fixture (shorted), R_s X_s .
- (3) Measure admittance of the specimen, G_m B_m .
- (4) Calculate corrected impedance $|Z|$ using the formula below.

$$|Z| = (R_x^2 + X_x^2)^{1/2}$$

Where

$$R_x = \frac{G_m - G_o}{(G_m - G_o)^2 + (B_m - B_o)^2} - R_s$$

$$X_x = \frac{-(B_m - B_o)}{(G_m - G_o)^2 + (B_m - B_o)^2} - X_s$$