# Wire-wound Metal Power Inductors MCOIL™ LSDN series
# for General Electronic Equipment for Consumer
# Wire-wound Metal Power Inductors MCOIL™ LLDN series
# for Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)

■RELIABILITY DATA

| 1. Operating Temperature Range | |
|---|---|
| Specified Value | −40～＋125℃ |
| Test Methods and Remarks | Including self-generated heat |

| 2. Storage Temperature Range | |
|---|---|
| Specified Value | −40～＋85℃ |
| Test Methods and Remarks | −5 to 40℃ for the product with taping. |

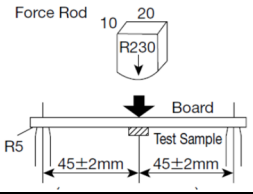
| 3. Rated current | |
|---|---|
| Specified Value | Within the specified tolerance |

| 4. Inductance | |
|---|---|
| Specified Value | Within the specified tolerance |
| Test Methods and Remarks | Measuring equipment : LCR Meter (HP 4285A or equivalent)<br>Measuring condition : Please see item list. |

| 5. DC Resistance | |
|---|---|
| Specified Value | Within the specified tolerance |
| Test Methods and Remarks | Measuring equipment : DC ohmmeter (HIOKI 3227 or equivalent) |

| 6. Self resonance frequency | |
|---|---|
| Specified Value | — |

| 7. Temperature characteristic | |
|---|---|
| Specified Value | Inductance change : Within ±10% |
| Test Methods and Remarks | Measurement of inductance shall be taken at temperature range within −40℃～＋125℃.<br>With reference to inductance value at ＋20℃., change rate shall be calculated. |

| 8. Resistance to flexure of substrate | |
|---|---|
| Specified Value | No damage |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow. As illustrated below, apply force in the direction of the arrow indicating until deflection of the test board reaches to 2 mm.<br>Test board size : 100×40×1.0 mm<br>Test board material : Glass epoxy-resin<br>Solder cream thickness : 0.10 mm<br>  |

| 9. Insulation resistance : between wires | |
|---|---|
| Specified Value | — |

| 10. Insulation resistance : between wire and core | |
|---|---|
| Specified Value | — |

| 11. Withstanding voltage : between wire and core | |
|---|---|
| Specified Value | — |

| 12. Adhesion of terminal electrode | |
|---|---|
| Specified Value | Shall not come off PC board |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow.<br>Applied force : 10N to X and Y directions.<br>Duration : 5s.<br>Solder cream thickness : 0.10mm. |

| 13. Resistance to vibration | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow.<br>Then it shall be submitted to below test conditions. |

| | | |
|---|---|---|
| Frequency Range | 10～55Hz | |
| Total Amplitude | 1.5mm (May not exceed acceleration 196m/s$^2$) | |
| Sweeping Method | 10Hz to 55Hz to 10Hz for 1min. | |
| Time | X | For 2 hours on each X, Y, and Z axis. |
| | Y | |
| | Z | |

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.

| 14. Solderability | |
|---|---|
| Specified Value | At least 90% of surface of terminal electrode is covered by new solder. |
| Test Methods and Remarks | The test samples shall be dipped in flux, and then immersed in molten solder as shown in below table.<br>Flux : Ethanol solution containing rosin 25%. |

| | |
|---|---|
| Solder Temperature | 245±5℃ |
| Time | 5±1.0 sec. |

※Immersion depth : All sides of mounting terminal shall be immersed.

| 15. Resistance to soldering heat | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test sample shall be exposed to reflow oven at 230±5℃ for 40 seconds, with peak temperature at 260±5℃ for 5 seconds, 2 times.<br>Test board material : Glass epoxy-resin<br>Test board thickness : 1.0mm |

| 16. Thermal shock | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow. The test samples shall be placed at specified temperature for specified time by step 1 to step 4 as shown in below table in sequence. The temperature cycle shall be repeated 100 cycles. |

| Conditions of 1 cycle | | |
|---|---|---|
| Step | Temperature (℃) | Duration (min) |
| 1 | −40±3 | 30±3 |
| 2 | Room temperature | Within 3 |
| 3 | +85±2 | 30±3 |
| 4 | Room temperature | Within 3 |

| 17. Damp heat | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow.<br>The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table. |

| | |
|---|---|
| Temperature | 60±2℃ |
| Humidity | 90～95%RH |
| Time | 500+24/−0 hour |

| 18. Loading under damp heat | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow.<br>The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below table.<br>Temperature: 60±2℃<br>Humidity: 90～95%RH<br>Applied current: Rated current<br>Time: 500+24/−0 hour |

| 19. Low temperature life test | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow. After that, the test samples shall be placed at test conditions as shown in below table.<br>Temperature: −40±2℃<br>Time: 500+24/−0 hour |

| 20. High temperature life test | |
|---|---|
| Specified Value | — |

| 21. Loading at high temperature life test | |
|---|---|
| Specified Value | Inductance change : Within ±10%<br>No significant abnormality in appearance. |
| Test Methods and Remarks | The test samples shall be soldered to the test board by the reflow.<br>The test samples shall be placed in thermostatic oven set at specified temperature and applied the rated current continuously as shown in below table.<br>Temperature: 85±2℃<br>Applied current: Rated current<br>Time: 500+24/−0 hour |

| 22. Standard condition | |
|---|---|
| Specified Value | Standard test condition :<br>Unless otherwise specified, temperature is 20±15℃ and 65±20%of relative humidity.<br>When there is any question concerning measurement result: In order to provide correlation data, the test shall be condition of 20±2℃ of temperature, 65±5% relative humidity.<br>Inductance is in accordance with our measured value. |