

**Wire-wound Ferrite Bead Inductors for Power Lines LBMC/LBMG series
for Telecommunications Infrastructure and Industrial Equipment**
**Wire-wound Ferrite Bead Inductors for Power Lines LMMC/LMMG series
for Medical Devices classified as GHTF Class C (Japan Class III)**

■ RELIABILITY DATA

1. Operating Temperature Range															
Specified Value	-40°C ~ +125°C (Including self-generated heat)														
Test Methods and Remarks	Including self-generated heat														
2. Storage Temperature Range															
Specified Value	-40°C ~ +85°C														
Test Methods and Remarks	*Note: -5 to +40°C in taped packaging														
3. Impedance															
Specified Value	Within the specified range														
Test Methods and Remarks	Measuring equipment : Impedance analyzer (HP4291A) or its equivalent Measuring frequency : 100±1 MHz														
4. DC Resistance															
Specified Value	Within the specified range														
Test Methods and Remarks	Four-terminal method Measuring equipment : Milliohm High-Tester 3226 (Hioki Denki) or its equivalent														
5. Rated Current															
Specified Value	Within the specified range														
6. Vibration															
Specified Value	Appearance : No significant abnormality Impedance change : Within ±30% of the initial value														
Test Methods and Remarks	The test samples shall be soldered to the test board by the reflow. Then it shall be submitted to below test conditions. <table border="1" style="margin-left: 20px;"> <tr> <td>Frequency</td> <td colspan="2">10~2000Hz</td> </tr> <tr> <td>Total Amplitude</td> <td colspan="2">5G</td> </tr> <tr> <td>Sweeping Method</td> <td colspan="2">20min(10→2000→10Hz)</td> </tr> <tr> <td rowspan="3">Time</td> <td>X</td> <td rowspan="3">4hours</td> </tr> <tr> <td>Y</td> </tr> <tr> <td>Z</td> </tr> </table>	Frequency	10~2000Hz		Total Amplitude	5G		Sweeping Method	20min(10→2000→10Hz)		Time	X	4hours	Y	Z
Frequency	10~2000Hz														
Total Amplitude	5G														
Sweeping Method	20min(10→2000→10Hz)														
Time	X	4hours													
	Y														
	Z														
7. Solderability															
Specified Value	90% or more of immersed surface of terminal electrode shall be covered with fresh solder.														
Test Methods and Remarks	<table border="1" style="margin-left: 20px;"> <tr> <td>Solder Temperature</td> <td>245±5°C</td> </tr> <tr> <td>Time</td> <td>5sec</td> </tr> <tr> <td>Preconditioning</td> <td>Immersion into flux.</td> </tr> <tr> <td>Immersing Speed</td> <td>25mm/sec</td> </tr> </table>	Solder Temperature	245±5°C	Time	5sec	Preconditioning	Immersion into flux.	Immersing Speed	25mm/sec						
Solder Temperature	245±5°C														
Time	5sec														
Preconditioning	Immersion into flux.														
Immersing Speed	25mm/sec														
8. Resistance to Soldering Heat															
Specified Value	Appearance : No significant abnormality Impedance change : Within ±30% of the initial value														
Test Methods and Remarks	The test sample shall be exposed to reflow oven at 230°C for 40 seconds, with peak temperature at 260+0/-5°C for 10 seconds, 2times. Test board material : Glass epoxy-resin Test board thickness : 1.6mm														

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification.
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9. Thermal Shock

Specified Value	Appearance : No significant abnormality Impedance change : Within +50/−10% of the initial value															
Test Methods and Remarks	<p>Conditions for 1 cycle</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>−40±3°C</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>125±2°C</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table> <p>Number of cycles : 1000 Mounting method : Soldering onto PC board The measurement, after the test, shall be carried out the test sample has been left for 2 to 3 hours.</p>	Step	Temperature (°C)	Duration (min.)	1	−40±3°C	30±3	2	Room Temperature	Within 3	3	125±2°C	30±3	4	Room Temperature	Within 3
Step	Temperature (°C)	Duration (min.)														
1	−40±3°C	30±3														
2	Room Temperature	Within 3														
3	125±2°C	30±3														
4	Room Temperature	Within 3														

10. Resistance to Humidity (steady state)

Specified Value	Appearances : No significant abnormality Impedance change : Within ±30% of the initial value						
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow. The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.</p> <table border="1"> <tbody> <tr> <td>Temperature</td> <td>40±2°C</td> </tr> <tr> <td>Humidity</td> <td>90~95%RH</td> </tr> <tr> <td>Time</td> <td>1000+24/−0 hour</td> </tr> </tbody> </table> <p>The measurement, after the test, shall be carried out the test sample has been left for 2 to 3 hours.</p>	Temperature	40±2°C	Humidity	90~95%RH	Time	1000+24/−0 hour
Temperature	40±2°C						
Humidity	90~95%RH						
Time	1000+24/−0 hour						

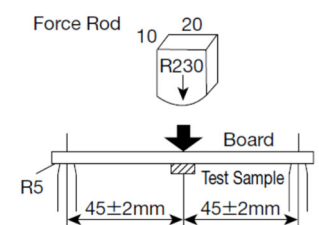
11. Loading under Damp Heat

Specified Value	Appearance : No significant abnormality Impedance change : Within ±30% of the initial value								
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow soldering. The test samples shall be placed in thermostatic oven set at specified temperature, humidity, and applied the rated current continuously as shown in below table.</p> <table border="1"> <tbody> <tr> <td>Temperature</td> <td>85±2°C</td> </tr> <tr> <td>Humidity</td> <td>85%RH</td> </tr> <tr> <td>Applied current</td> <td>Rated current</td> </tr> <tr> <td>Time</td> <td>1000+24/−0 hour</td> </tr> </tbody> </table> <p>The measurement, after the test, shall be carried out the test sample has been left for 2 to 3 hours.</p>	Temperature	85±2°C	Humidity	85%RH	Applied current	Rated current	Time	1000+24/−0 hour
Temperature	85±2°C								
Humidity	85%RH								
Applied current	Rated current								
Time	1000+24/−0 hour								

12. High Temperature Loading Test

Specified Value	Appearance : No significant abnormality Impedance change : Within ±30% of the initial value						
Test Methods and Remarks	<p>The test samples shall be soldered to the test board by the reflow soldering. The test samples shall be placed in thermostatic oven set at specified temperature and applied the rated current continuously as shown in below table.</p> <table border="1"> <tbody> <tr> <td>Temperature</td> <td>85±2°C</td> </tr> <tr> <td>Applied current</td> <td>Rated current</td> </tr> <tr> <td>Time</td> <td>1000+24/−0 hour</td> </tr> </tbody> </table> <p>The measurement, after the test, shall be carried out the test sample has been left for 2 to 3 hours.</p>	Temperature	85±2°C	Applied current	Rated current	Time	1000+24/−0 hour
Temperature	85±2°C						
Applied current	Rated current						
Time	1000+24/−0 hour						

13. Bending Strength

Specified Value	Appearance : No mechanical damage.
Test Methods and Remarks	<p>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.</p> <p>Warp : 2mm Testing board : Glass epoxy-resin substrate Thickness : 1.6mm</p> 

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14. Adhesion of Electrode

Specified Value	No separation or indication of separation of electrode.
Test Methods and Remarks	Applied force : 17.7N Duration : 10 sec.

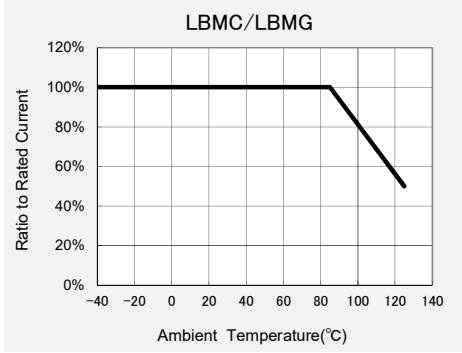
Note on standard condition: "standard condition" referred to herein is defined as follows:
5 to 35°C of temperature, 45 to 85% relative humidity and 86 to 106kPa of air pressure.
When there are questions concerning measurement results:
In order to provide correlation data, the test shall be conducted under condition of 20±2°C of temperature, 60 to 70% relative humidity and 86 to 106kPa of air pressure. Unless otherwise specified, all the tests are conducted under the "standard condition."

■ Derating of Rated Current

● LBMC/LBMG/LMMC/LMMG series

Derating of current is necessary for LBMC/LBMG/LMMC/LMMG series depending on ambient temperature. Please refer to the chart shown below for appropriate derating of current.

LBMC/LBMG series



LMMC/LMMG series

