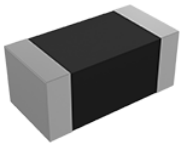
MetalLions

MLPB1608E Series

High Current Multilayer Chip Ferrite Bead



FEATURES

- Internal silver printed layers and magnetic shielded structures to minimize crosstalk
- Monolithic structure for excellent reliability
- Smaller DC resistance and larger allowable current Can be used in a wide range of frequency to suppress EMI
- Operate temperature range .... －55℃～＋125℃(Including self temp. rise)
- RoHS compliant

APPLICATIONS

- Noise suppression for power lines or large current signal lines of electric equipments, such as communication equipments, computers, A/V equipments, etc

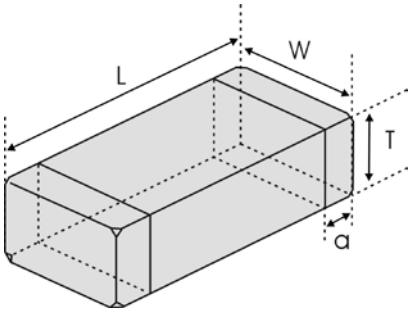
Explanation of Part Number

MLPB 1608 E- 471 T 20

1 2 3 4 5 6

- ♦ 1:Product Series:Chip Ferrite Bead For Ultra Large Current
- ♦ 2:Dimensions:
- ♦ 3: Material Code: E
- ♦ 4:Nominal Impedance:471=470Ω
- ♦ 5:Packing:Tape Carrier Package
- ♦ 6:Rated Current:20=2000mA

SHAPE AND DIMENSIONS



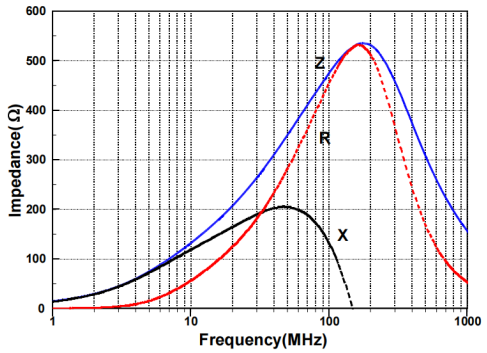
Unit: mm [inch]

Type	L	W	T	a
MLPB1608 [0603]	1.65±0.15 [.065±.006]	0.8±0.15 [.031±.006]	0.8±0.15 [.031±.006]	0.3±0.2 [.012±.008]

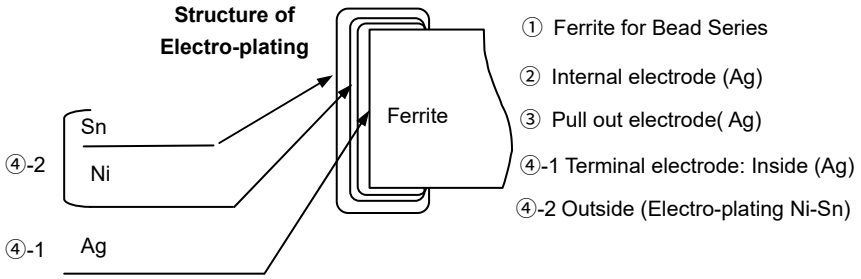
Electrical Properties:

Part Number	Impedance	Z Test Frequency	Max. DC Resistance	Max. Rated Current
Units	Ω	MHz	mΩ	mA
Symbol	Z	Freq.	DCR	Ir
MLPB1608E-471T20	470±25%	100	120	2000

Impedance Frequency Characteristics



Material Information:



Code	Part Name	Material Name
①	Ferrite Body	Ferrite Powder
②	Inner Coils	Silver Paste
③	Pull-out Electrode (Ag)	Silver Paste
④-1	Terminal Electrode: Inside Ag	Termination Silver Composition
④-2	Electro-Plating: Ni/Sn plating	Plating Chemicals

Reliability Test

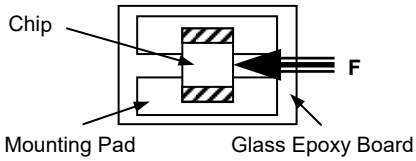
<table>
<tr><th>Items</th><th>Requirements</th><th>Test Methods and Remarks</th></tr>
<tr><td>Terminal Strength</td><td>No removal or split of the termination or other defects shall occur.
 

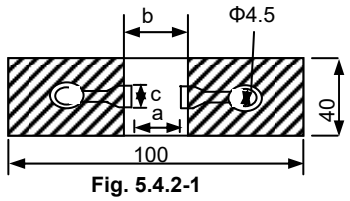
Fig.5.4.1-1</td><td>① Solder the bead to the testing jig (glass epoxy board shown in Fig. 5.4.1-1) using eutectic solder. Then apply a force in the direction of the arrow.
② 5N force for 1005 and 1608 series,
10N force for 2012 series.
③ Keep time: 10±1s.
④ Speed: 1.0mm/s.</td></tr>
<tr><td>Resistance to Flexure</td><td>No visible mechanical damage.
Unit: mm [inch]
<table>
<tr><th>Type</th><th>a</th><th>b</th><th>c</th></tr>
<tr><td>1005[0402]</td><td>0.4</td><td>1.5</td><td>0.5</td></tr>
<tr><td>1608[0603]</td><td>1.0</td><td>3.0</td><td>1.2</td></tr>
<tr><td>2012[0805]</td><td>1.2</td><td>4.0</td><td>1.65</td></tr>
</table>


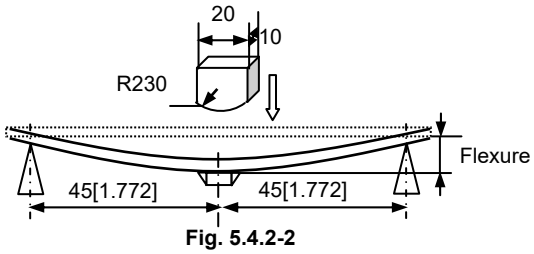
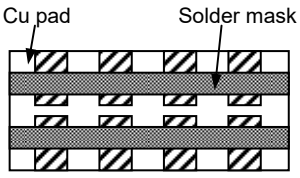
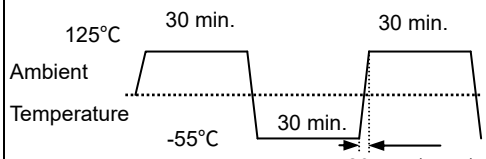
Fig. 5.4.2-1</td><td>① Solder the bead to the test jig (glass epoxy board shown in Fig. 5.4.2-1) Using a eutectic solder. Then apply a force in the direction shown Fig. 5.4.2-2.
② Flexure: 2mm.
③ Pressurizing Speed: 0.5mm/sec.
④ Keep time: 30 sec.
 

Fig. 5.4.2-2</td></tr>
<tr><td>Vibration</td><td>① No visible mechanical damage.
② Impedance change: within ±20%.
 

Glass Epoxy Board
Fig. 5.4.3-1</td><td>① Solder the bead to the testing jig (glass epoxy board shown in Fig. 5.4.3-1) using eutectic solder.
② The bead shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz.
③ The frequency range from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).</td></tr>
<tr><td>Dropping</td><td>① No visible mechanical damage.
② Impedance change: within ±20%.</td><td>Drop chip bead 10 times on a concrete floor from a height of 100 cm.</td></tr>
<tr><td>Temperature</td><td>Impedance change should be within ±20% of initial value measuring at 20°C.</td><td>Temperature range: -55°C ~ +125°C.
Reference temperature: +20°C.</td></tr>
<tr><td>Solderability</td><td>① No visible mechanical damage.
② Wetting shall exceed 95% coverage.</td><td>① Solder temperature: 240±2°C.
② Duration: 3 sec.
③ Solder: Sn/3.0Ag/0.5Cu.
④ Flux: 25% Resin and 75% ethanol in weight.</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>① No visible mechanical damage.
② Wetting shall exceed 95% coverage.
③ Impedance change: within ±20%.</td><td>① Solder temperature: 260±3°C
② Duration: 5 sec.
③ Solder: Sn/3.0Ag/0.5Cu.
④ Flux: 25% Resin and 75% ethanol in weight.
⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td></tr>
</table>

Thermal Shock	① No mechanical damage. ② Impedance change: Within ±20%  **Fig. 5.4.8-1**	① Temperature, Time: (See **Fig. 5.4.8-1**) -55℃ for 30±3 min→125℃ for 30±3min ② Transforming interval: Max. 20 sec. ③ Tested cycle: 100 cycles. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Resistance to Low Temperature	① No mechanical damage. ② Impedance change: within ±20%	① Temperature: -55±2℃ ② Duration: 1000^{+24} hours. ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Resistance to High Temperature	① No mechanical damage. ② Impedance change: within ±20%	① Temperature: 125±2℃. ② Duration: 1000^{+24} hours. ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Damp Heat (Steady States)	① No visible mechanical damage. ② Impedance change: within ±20%	① Temperature: 60±2℃. ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+24} hours. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Loading Under Damp Heat	① No visible mechanical damage. ② Impedance change: within ±20%	① Temperature: 60±2℃. ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+24} hours. ④ Applied current: Rated current. ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Loading at High Temperature (Life Test)	① No visible mechanical damage. ② Impedance change: within ±20%	① Temperature: 85±2℃ ② Duration: 1000^{+24} hours. ③ Applied current: Rated current. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.

Packaging and Storage

1. Packaging

Tape Carrier Packaging:

Packaging code: T

a. Tape carrier packaging are specified in attached figure **Fig. 6.1-1~3**

b. Tape carrier packaging quantity please see the following table:

Type	1608[0603]
T(mm)	0.8±0.15
Tape	Paper Tape
Quantity	4K

(1) Taping Drawings (Unit: mm)

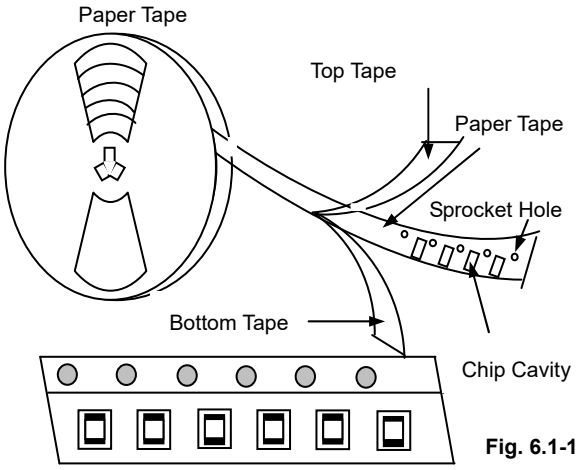


Fig. 6.1-1

Remark: The sprocket holes are to the right as the tape is pulled toward the user.

(2) Taping Dimensions (Unit: mm)

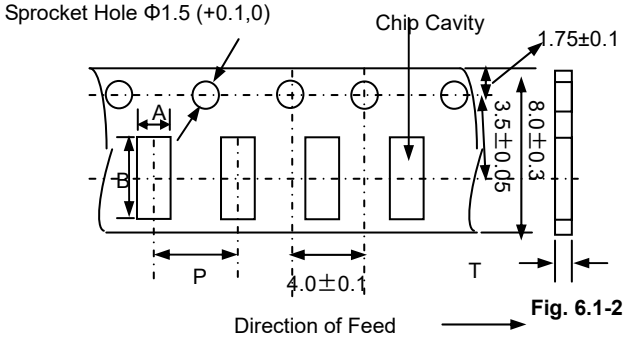


Fig. 6.1-2

Paper Tape

Type	A	B	P	T max
1608[0603]	1.0±0.2	1.8±0.2	4.0±0.1	1.1

(3) Reel Dimensions (Unit: mm)

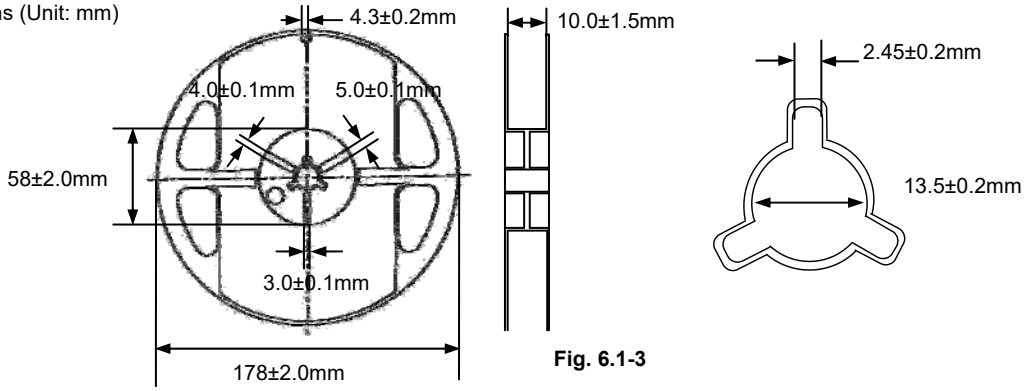


Fig. 6.1-3

Storage

a. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40℃ or less and 70% RH or less.

b. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H_2S).

c. Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.

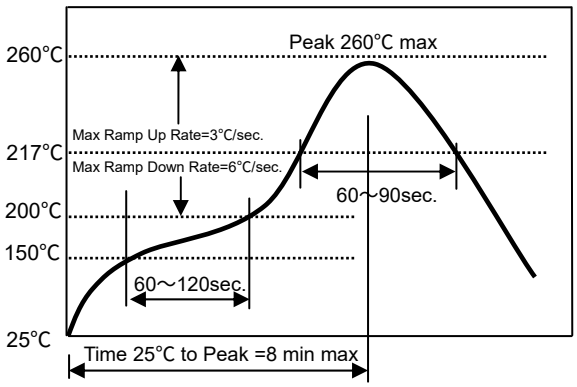
d. Solderability specified in **Clause 5.4.6** shall be guaranteed for 12 months from the date of delivery on condition that they are stored at the environment specified in **Clause 3** .For those parts, which passed more than 12 months shall be checked solder-ability before use.

Recommended Soldering Technologies

1.Reflowing Profile:

△ Preheat condition: 150 ~200°C/60~120sec.
△ Allowed time above 217°C: 60~90sec.
△ Max temp: 260°C
△ Max time at max temp: 10sec.
△ Solder paste: Sn/3.0Ag/0.5Cu
△ Allowed Reflow time: 2x max

[Note: The reflow profile in the above table is only for qualification and is not meant to specify board assembly profiles. Actual board assembly profiles must be based on the customer's specific board design, solder paste and process, and should not exceed the parameters as the Reflow profile shows.]



2. Iron Soldering Profile.

△ Iron soldering power: Max.30W
△ Pre-heating: 150 °C/60sec.
△ Soldering Tip temperature: 350°CMax.
△ Soldering time: 3sec Max.
△ Solder paste: Sn/3.0Ag/0.5Cu
△ Max.1 times for iron soldering

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]