

<b>DC Common Mode Choke Coil</b>
<b>PLT09HN2003R0P1B Reference Specification</b>

**1. Scope**

This reference specification applies to DC Common Mode Choke Coil (PLT09HN2003R0P1B).

**2. Part Numbering**

(Ex.)

<u>PL</u>	<u>T</u>	<u>09</u>	<u>H</u>	<u>N</u>	<u>200</u>	<u>3R0</u>	<u>P</u>	<u>1</u>	<u>B</u>
Product ID	Type	Applications	Structure	Safety Standard	Inductance	Rated Current	Winding Mode	Lead Dimensions	Packaging (B: Bulk)
				(N: Not certified)			(P: Aligned Winding)		

**3. Rating**

Item	Specification
Customer Part Number	
Murata Part Number	PLT09HN2003R0P1B
Rated Voltage	50 V(DC)
Rated Current	3 A
Withstand Voltage	125 V(DC) (1 minute)
Insulation Resistance	10 MΩ min.
Direct Current Resistance	0.03 Ω max.
Inductance L1,L2	20 μH min.
Inductance Difference  L1-L2	2 μH max.
Temperature Characteristic (Inductance change)	within ± $\frac{80}{50}$ %
Temperature Rise	30 °C max.
Operating Temperature Range (Ambient Temperature)	- 40 °C to + 85 °C
Storage Temperature Range	- 40 °C to + 85 °C

**4. Standard Testing Conditions**

&lt; Unless otherwise specified &gt;

Temperature : Ordinary Temp. 15 °C to 35 °C

Humidity : Ordinary Humidity 25 %(RH) to 85 %(RH)

&lt; In case of doubt &gt;

Temperature : 20 °C ± 2 °C

Humidity : 60 %(RH) to 70 %(RH)

Atmospheric pressure : 86 kPa to 106 kPa

**5. Appearance, Dimensions and Equivalent Circuit Diagram**

See Fig. 1.

**6. Marking**

(1) Inductance : **200**  
 (2) Manufacturer Identification : **muRata**

**7. Electrical Performance**

No.	Item	Specification	Test Method
7.1	Inductance L1,L2  L1 - L2	Meet item 3.	Measuring terminal : T1-T2(L1) , T3-T4(L2) Frequency : 1 kHz
7.2	Insulation Resistance		Measuring terminal : (T1,T2) – (T3,T4) Test Voltage : 100 V(DC) Time : 1 minute
7.3	Direct Current Resistance		Measuring terminal : T1-T2 , T3-T4

No.	Item	Specification	Test Method																
7.4	Temperature Characteristics	Meet item 3.	Inductance shall be measured at each step specified in Table 1 after reaching the thermal equilibrium. The inductance change against the inductance at step 3 shall be calculated. <u>Table 1</u> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Step</th> <th>Temperature</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+20 ± 2 °C</td> <td>4</td> <td>+85 ± 2 °C</td> </tr> <tr> <td>2</td> <td>-25 ± 2 °C</td> <td>5</td> <td>+20 ± 2 °C</td> </tr> <tr> <td>3</td> <td>+20 ± 2 °C</td> <td></td> <td></td> </tr> </tbody> </table>	Step	Temperature	Step	Temperature	1	+20 ± 2 °C	4	+85 ± 2 °C	2	-25 ± 2 °C	5	+20 ± 2 °C	3	+20 ± 2 °C		
Step	Temperature	Step	Temperature																
1	+20 ± 2 °C	4	+85 ± 2 °C																
2	-25 ± 2 °C	5	+20 ± 2 °C																
3	+20 ± 2 °C																		
7.5	Temperature rise	The surface of coil : 30 °C max.	Applying Current : Rated Current																
7.6	Withstand Voltage	Products shall be no failure.	Measuring terminal : (T1,T2) - (T3,T4) (between terminals) Test Voltage : 125 V(DC) (1 minute)																

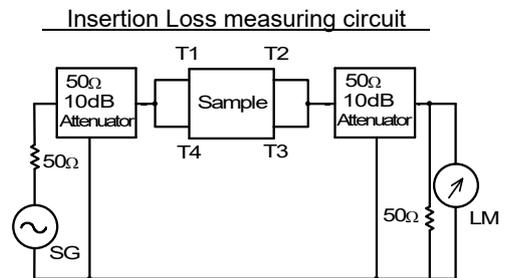
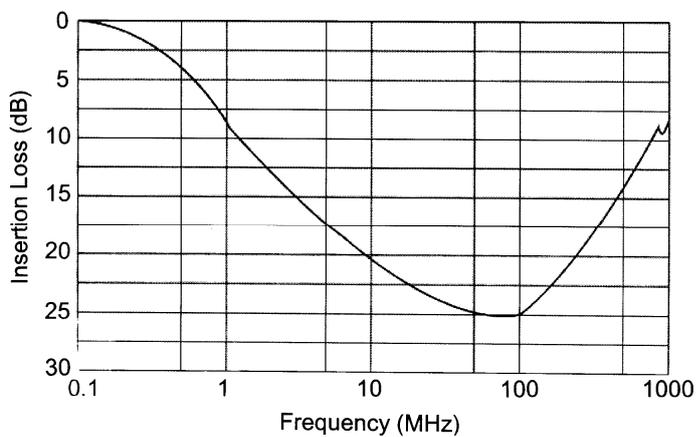
### 8. Mechanical Performance

No.	Item	Specification	Test Method						
8.1	Appearance and Dimensions	There shall not be a conspicuous dirt, crack, and so on. Dimensions shall be as shown in Fig.1.	Visual Inspection Measured with slide calipers						
8.2	Lead wire Strength	Products shall not be damaged. (cutting of lead wire, missing of pin, etc.)	The body of products shall be fixed, and the force of 5N shall be applied gradually and sustained for 30s to each lead wires in the axial direction of the lead wires.						
8.3	Solderability	The lead wires shall be covered with new solder at least 75% along the circumference of the immersed part.	Flux : Ethanol solution of rosin, 25(wt)% Pre-heat : 150 ± 10 °C, 60 ~ 90 s Solder : Sn-3Ag-0.5Cu Solder Temperature : 245 ± 5 °C Immersion Time : 2 ± 0.5 s Immersion Depth : 2.6 ± 0.8 mm from the root of lead wire						
8.4	Resistance to soldering heat	Meet Table 2. <u>Table 2</u> <table border="1"> <tbody> <tr> <td>Appearance</td> <td>No damage</td> </tr> <tr> <td>Inductance Change</td> <td>within ± 10 %</td> </tr> <tr> <td>Withstand Voltage</td> <td>Meet item 7.6</td> </tr> </tbody> </table>	Appearance	No damage	Inductance Change	within ± 10 %	Withstand Voltage	Meet item 7.6	Flux : Ethanol solution of rosin, 25(wt)% Pre-heat : 150 ± 10 °C, 60 ~ 90 s Solder : Sn-3Ag-0.5Cu Solder Temperature : 260 ± 5 °C Immersion Time : 10 ± 1 s Immersion Depth : 2.6 ± 0.8 mm from the root of lead wire Then measured after exposure in the room condition for 4 to 24 hours.
Appearance	No damage								
Inductance Change	within ± 10 %								
Withstand Voltage	Meet item 7.6								
8.5	Vibration		Vibration Frequency : 10Hz to 55Hz to 10Hz for 1 minute Amplitude : 1.5 mm Time : A period of 2 hours in each of 3 mutually perpendicular directions. (Total 6 hours)						
8.6	Shock		Maximum Acceleration : 981 m / s <sup>2</sup> Normal Duration : 6 ms Wave form : Half-sine wave Velocity Change : 3.75 m / s Direction : along the three mutually perpendicular axes of the product Times : Three shocks in each directions (total 18 times)						

## 9. Enviromental Performance

No.	Item	Specification	Test Method
9.1	Temperature Cycle	Meet Table 2.	1 cycle : 1 step : - 40 °C (+ 0 °C, - 3 °C) / 30 min. 2 step : Ordinary Temp. / 3 min. max. 3 step : + 85 °C (+ 3 °C, - 0 °C) / 30 min. 4 step : Ordinary Temp. / 3 min. max. Total of 10 cycles Then measured after exposure in the room condition for 4 to 24 hours.
9.2	Humidity		Temperature : 40 °C ± 2 °C Humidity : 90 %(RH) to 95 %(RH) Time : 1000 h (+24h , -0h) Then measured after exposure in the room condition for 4 to 24 hours.
9.3	Cold Resistance		Temperature : - 40 °C ± 2 °C Time : 1000 h (+24h , -0h) Then measured after exposure in the room condition for 4 to 24 hours.
9.4	Heat Resistance		Temperature : 85 °C ± 2 °C Time : 1000 h (+24h , -0h) Then measured after exposure in the room condition for 4 to 24 hours.
9.5	Heat Life		Temperature : 85 °C ± 2 °C Test Voltage : 50 V(DC) Time : 1000 h (+24h , -0h) Then measured after exposure in the room condition for 4 to 24 hours.

## 10. Insertion Loss (Typical)



Measuring circuit (based on MIL-STD-220)

$$A = 20 \log(E1/E2)$$

A : Insertion Loss (dB)

E1 : Level with Common mode choke coil

E2 : Level without Common mode choke coil

## 11. Specification of Packaging

### 11.1. Packing Quantity

Individual packaging
100pcs

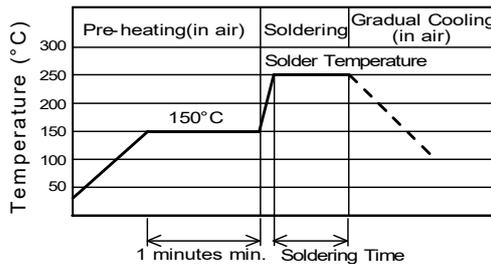
### 11.2. Packing Method

Styrene foam of the stuck products on are placed in an Individual packaging .

A quantity in an Outer packaging is depending on a quantity of an order.



(2) Standard flow soldering profile.



Solder Temperature	Soldering Time
250 ~ 260 °C	4 ~ 6 s

- (3) Resistance to soldering iron goes in the following condition that tip temperature is 350 °C max. and soldering time is 3 s max.  
 Products and the leads should not be subjected to any mechanical stress during soldering process.  
 (and also while subjected to the equivalent high temperature.)

### 13.2. Cleaning

Avoid cleaning product due to non-waterproof construction.

### 13.3. Storage and Handling Requirements

(1) Storage period

Use the products within 12 months after delivered.

Solderability should be checked if this period is exceeded.

(2) Storage conditions

- Products should be stored in the warehouse on the following conditions.

Temperature : -10 °C to 40 °C

Humidity : 15 % to 85 % relative humidity No rapid change on temperature and humidity

Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidation of lead terminals resulting in poor solderability or corrosion of component windings.

- Products should be stored on the palette for the prevention of the influence from humidity, dust and so on.
- Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.

(3) Handling Condition

Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

### 14. Note

- (1) Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
- (2) You are requested not to use our product deviating from the reference specifications.
- (3) The contents of this reference specification are subject to change without advance notice. Please approve our product specifications or transact the approval sheet for product specifications before ordering.

Fig. 1

**PLT09H Appearance and Dimensions**

