

L 2 0 1 6 1 0 1 R 0 M - □ □
 (a) (b) (c) (d) (e)

(a) Series code

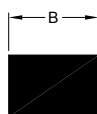
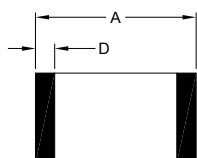
(b) Dimension code

(c) Inductance code : 1R0 = 1.0uH

(d) Tolerance code : M = $\pm 20\%$, Y = $\pm 30\%$

(e) Internal Controller Number

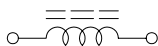
2. CONFIGURATION & DIMENSIONS :



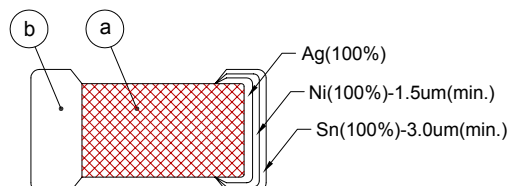
Unit:m/m

A	B	C	D
2.0 ± 0.3	1.6 ± 0.2	1.0 Max.	0.50 ± 0.3

3. SCHEMATIC :



4. MATERIALS :



(a) Body : Ferrite

(b) Termination : Ag/Ni/Sn

5. GENERAL SPECIFICATION :

- a) Temp. rise : 40°C Max.
- b) Rated current : Base on temp. rise
- c) Storage temp. : -40°C to +105°C
- d) Operating temp. : -40°C to +105°C
- e) Resistance to solder heat : 260°C.10secs



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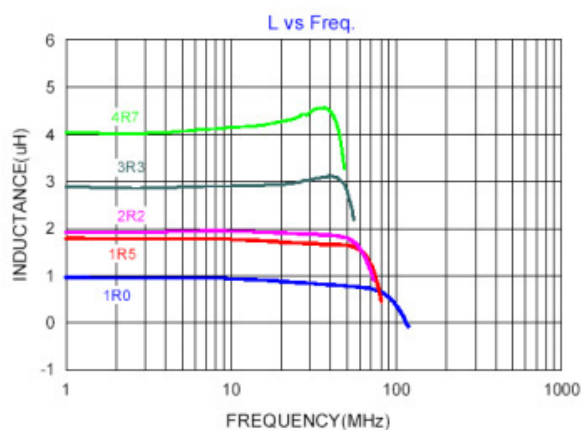


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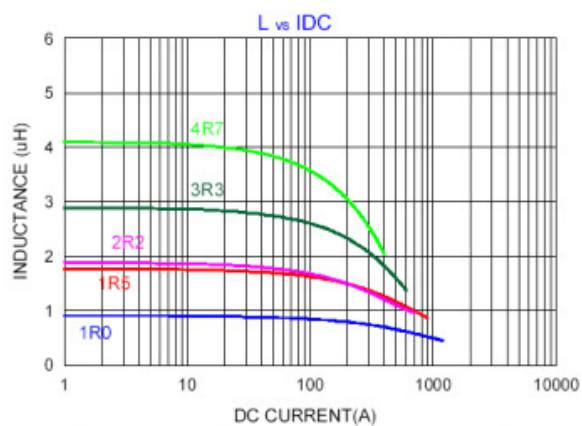
6. ELECTRICAL CHARACTERISTICS :

Part Number	Inductance (μ H)	Test Frequency (MHz)	Rated Current (mA) Max	DC Resistance (Ω)	SRF (MHz) Min
L2016101R0M-□ □	1.0 $\pm$ 20%	1	1300	0.12 $\pm$ 30%	110
L2016101R5M-□ □	1.5 $\pm$ 20%	1	1300	0.12 $\pm$ 30%	75
L2016102R2M-□ □	2.2 $\pm$ 20%	1	1200	0.14 $\pm$ 30%	70
L2016103R3M-□ □	3.3 $\pm$ 20%	1	1000	0.18 $\pm$ 30%	50
L2016104R7M-□ □	4.7 $\pm$ 20%	1	900	0.23 $\pm$ 30%	40

6-1. INDUCTANCE VS. FREQUENCY CURVE :



6-2 INDUCTANCE-CURRENT CURVE :



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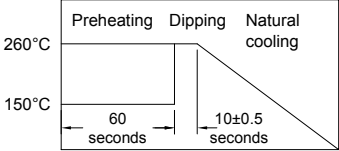
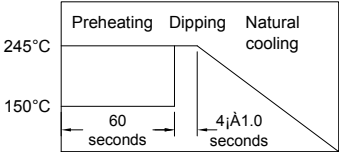
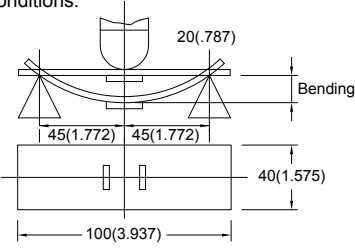
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7. RELIABILITY & TEST CONDITION :

ITEM	PERFORMANCE	TEST CONDITION						
Operating Temperature	-40~+105°C (Including self-temperature rise)							
Storage Temperature	-40~+105°C	Long storage conditions, please see the application notice						
Inductance	Refer to standard electrical characteristics list	HP4291, HP E4991+HP4287 +HP16192						
DC Resistance		HP4338						
Rated Current		DC Power Supply, over rated current ,there will be some risk						
Temperature Rise Test	40°C max. (Δt)	1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer.						
Solder Heat Resistance	No mechanical damage Remaining terminal electrode : 75% min. Appearance: No significant abnormality. Inductance change: Within $\pm 10\%$.  The diagram shows a temperature profile for solder heat resistance testing. It starts at 150°C for 60 seconds (Preheating), then rises to 260°C for 10±0.5 seconds (Dipping), and finally cools down (Natural cooling).	Preheat : 150°C, 60sec. Solder : Sn-Cu0.5 Solder Temperature : 260±5°C Flux for lead free : ROL0 Dip Time : 10±0.5sec.						
Solderability	More than 95% of the terminal electrode should be covered with solder.  The diagram shows a temperature profile for solderability testing. It starts at 150°C for 60 seconds (Preheating), then rises to 245°C for 4±1.0 seconds (Dipping), and finally cools down (Natural cooling).	Preheat : 150°C, 60sec. Solder : Sn-Cu0.5 Solder Temperature : 245±5°C Flux for lead free : ROL0 Dip Time : 4±1sec.						
Terminal Strength	The terminal electrode & the dielectric must not be damaged by the forces applied on the right conditions.  The diagram shows a cross-section of the terminal electrode being tested. A force 'W' is applied to the terminal electrode.	<table border="1"> <thead> <tr> <th>Size</th><th>Force (Kgf)</th><th>Time (sec)</th></tr> </thead> <tbody> <tr> <td>L201610</td><td>1.0</td><td>> 30</td></tr> </tbody> </table>	Size	Force (Kgf)	Time (sec)	L201610	1.0	> 30
Size	Force (Kgf)	Time (sec)						
L201610	1.0	> 30						
Flexture Strength	The terminal electrode & the dielectric must not be damaged by the forces applied on the right conditions.  The diagram shows a cross-section of the terminal electrode being tested. The terminal electrode is bent by a force 'W'. Dimensions are given: 20(.787) for the terminal electrode width, 45(1.772) for the terminal electrode length, 40(1.575) for the terminal electrode thickness, and 100(3.937) for the terminal electrode width.	Solder a chip on a test substrate, bend the substrate by 2mm (0.079in) and return. The duration of the applied forces shall be 60(+5) Sec						



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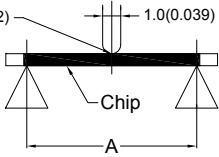
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7. RELIABILITY & TEST CONDITION :

ITEM	PERFORMANCE	TEST CONDITION												
Bending Strength	The ferrite should not be damaged by forces applied on the right condition. 	<table border="1"> <tr> <th>Size</th><th>mm (inches)</th><th>P-Kgf</th></tr> <tr> <td>L201610</td><td>1.40(0.055)</td><td>1.0</td></tr> </table>	Size	mm (inches)	P-Kgf	L201610	1.40(0.055)	1.0						
Size	mm (inches)	P-Kgf												
L201610	1.40(0.055)	1.0												
Random Vibration Test	Appearance : Cracking, Chipping & any other defects harmful to the characteristics should not be allowed. Inductance: within±30%	Frequency : 10-55-10Hz for 15 min. Amplitude : 1.52mm Directions & times : X, Y, Z directions for 15 mins This cycle shall be performed 12 times in each of three mutually perpendicular direction.(Total 9 hours)												
Drop	No mechanical damage Inductance change : within±10%	Drop 10 times on a concrete floor from a height of 75cm.												
Life testing at high temperature Temperature	Appearance : No damage. Inductance : Within ±10% of initial value.	Temperature : 105±2°C Applied Current : rated current Duration : 1008±12hrs Measured at room temperature after placing for 2 to 3hrs.												
Humidity		Humidity : 90~95% RH. Temperature : 40±2°C Duration : 504±8hrs Measured at room temperature after placing for 2 to 3hrs.												
Thermal Shock	Appearance : No damage. Inductance : Within ±10% of initial value. <table border="1"> <thead> <tr> <th>Phase</th><th>Temperature (°C)</th><th>Times (min.)</th></tr> </thead> <tbody> <tr> <td>1</td><td>-40±2°C</td><td>30±5</td></tr> <tr> <td>2</td><td>room temp</td><td><0.5</td></tr> <tr> <td>3</td><td>+105±2°C</td><td>30±5</td></tr> </tbody> </table> Measured : 500 times	Phase	Temperature (°C)	Times (min.)	1	-40±2°C	30±5	2	room temp	<0.5	3	+105±2°C	30±5	Condition for 1 cycle Step1 : -40±2°C 30±5 min. Step2 : +105±5°C 30±5 min. Number of cycles : 500 Measured at room temperature after placing for 2 to 3hrs.
Phase	Temperature (°C)	Times (min.)												
1	-40±2°C	30±5												
2	room temp	<0.5												
3	+105±2°C	30±5												
Low temperature storage test	Appearance : No damage. Inductance : Within ±30% of initial value.	Temperature : -40±2°C Duration : 500±8hrs Measured at room temperature after placing for 2 to 3hrs.												



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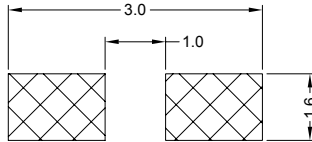


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8. SOLDERING AND MOUNTING :

8-1. Recommended PC Board Pattern



PC board should be designed so that products are not sufficient under mechanical stress as warping the board. Products shall be positioned in the sideways direction against the mechanical stress to prevent failure.

8-2. Soldering

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. The terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

8-2.1 Lead Free Solder Re-flow :

Recommended temperature profiles for re-flow soldering in Figure 1.

8-2.2 Soldering Iron (Figure 2) :

Products attachment with soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

Note :

- a) Preheat circuit and products to 150°C.
- b) 350°C tip temperature (max)
- c) Never contact the ceramic with the iron tip
- d) 1.0mm tip diameter (max)
- e) Use a 20 watt soldering iron with tip diameter of 1.0mm
- f) Limit soldering time to 4~5 secs.

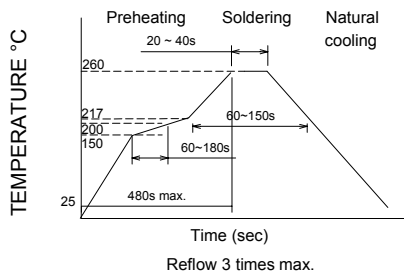


Figure 1. Re-flow Soldering (Pb Free)

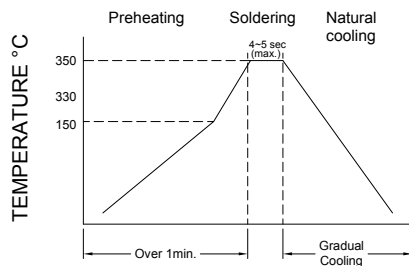


Figure 2. Hand Soldering



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8-3. Solder Volume

Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in Fig. 4.

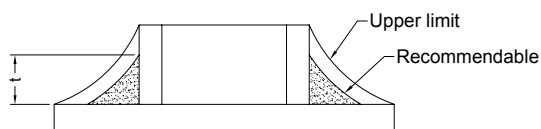
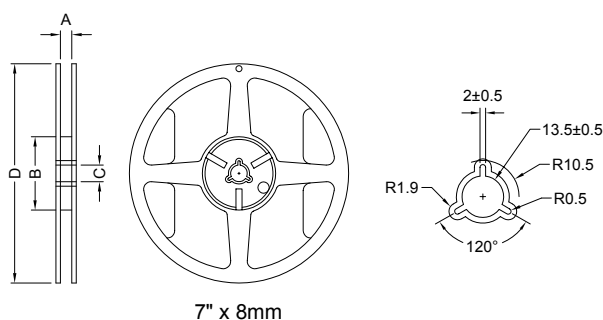


Figure 4

9. PACKAGING INFORMATION :

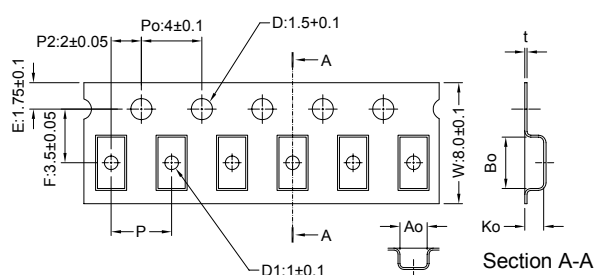
9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7" x 8mm	9±0.5	60.0±2.0	13.5±0.5	178.0±2.0

9-2 Tape Dimension / 8mm

Material : Plastic



Size	P(mm)	Bo(mm)	Ao(mm)	Ko(mm)	t(mm)
L201610	4.0±0.1	2.40±0.10	1.95±0.10	1.45 max	0.3 max

9-3. Packaging Quantity

Chip Size	L201610
Reel	3000



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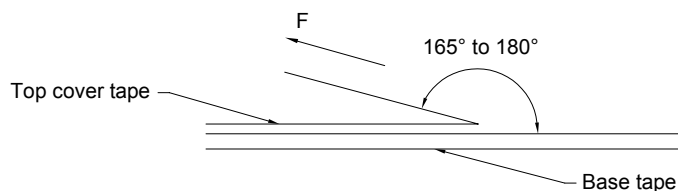
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9-4. Tearing Off Force



The force for tearing off cover tape is 15 to 60 grams in the arrow direction under the following conditions.

Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed (mm/min)
5~35	45~85	860~1060	300

Application Notice

1. Storage Conditions :

To maintain the solderability of terminal electrodes :

- Temperature and humidity conditions : 40°C and 70% RH.
- Recommended products should be used within 6 months from the time of delivery.
- The packaging material should be kept where no chlorine or sulfur exists in the air.

2. Transportation :

- Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
- The use of tweezers or vacuum pick up is strongly recommended for individual components.
- Bulk handling should ensure that abrasion and mechanical shock are minimized.



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