HIGH CURRENT MOLDED POWER INDUCTORS

L810HW SERIES

1. PART NO. EXPRESSION :

L 8 1 0 H W - 1 R 0 M F

(a) (b) (c) (d)(e)

(a) Series code

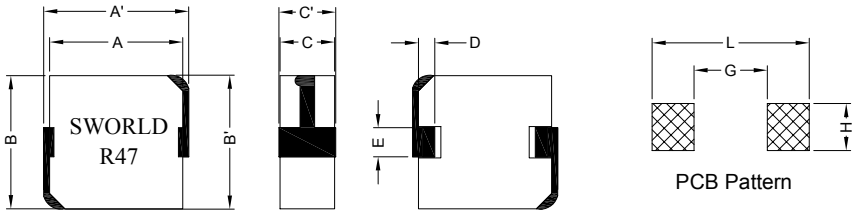
(b) Type code

(c) Inductance code : 1R0 = 1.0uH

(d) Tolerance code : M = ±20%

(e) F : Lead Free

2. CONFIGURATION & DIMENSIONS :

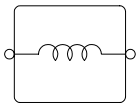


PCB Pattern

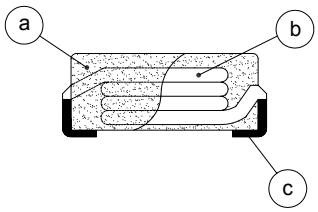
Unit:m/m

A'	A	B'	B	C'	C	D	E	G	H	L
13.9 Max.	12.7±0.3	13.5 Max.	12.7±0.3	3.7 Max.	3.5 Max.	2.5±0.5	3.0±0.5	7.0 Ref.	4.5 Ref.	15.0 Ref.

3. SCHEMATIC :



4. MATERIALS :



(a) Core

(b) Wire

(c) Terminal

5. FEATURES :

a) Shielded Construction

b) Frequency up to 5MHz

RoHS Compliant

NOTE : Specifications subject to change without notice. Please check our website for latest information.

11.11.2008

6. GENERAL SPECIFICATION :

a) Test Freq. : Q : 100KHz/1.0VDC

b) Ambient Temp. : 20°C

c) Operating Temp. : -55°C to +125°C

d) Storage Temp. : -55°C to +125°C

e) Humidity Range : 50 ~ 60% RH

f) Heat Rated Current (Irms) : Will cause the coil temp. rise approximately ΔT=40°C without core loss.

g) Saturation Current (Isat) : Will cause L_0 to drop approximately 20% typ.

h) Part Temperature (Ambient+Temp. Rise) : Should not exceed 125°C under worst case operating conditions.

7. ELECTRICAL CHARACTERISTICS :

Part No.	Inductance L_0 (μH) ±20% @ 0 Adc	Test Frequency (Hz)	Irms (A) Typ.	Isat (A) Typ.	DCR (mΩ) Max.	Q Min.
L810HW-R47MF	0.47	1.0VDC/100K	32	44	2.0	12
L810HW-R68MF	0.68	1.0VDC/100K	28	40	2.5	12
L810HW-R82MF	0.82	0.25VDC/100K	25	38	3.0	-
L810HW-1R0MF	1.00	1.0VDC/100K	24	36	3.5	20
L810HW-1R5MF	1.50	1.0VDC/100K	19	28	5.5	20
L810HW-2R2MF	2.20	1.0VDC/100K	16	20	8.0	20
L810HW-3R3MF	3.30	1.0VDC/100K	12	18	12	20
L810HW-4R7MF	4.70	1.0VDC/100K	10	16	15	20
L810HW-6R8MF	6.80	1.0VDC/100K	9	13	22	20
L810HW-100MF	10.0	1.0VDC/100K	7	9.5	34	20

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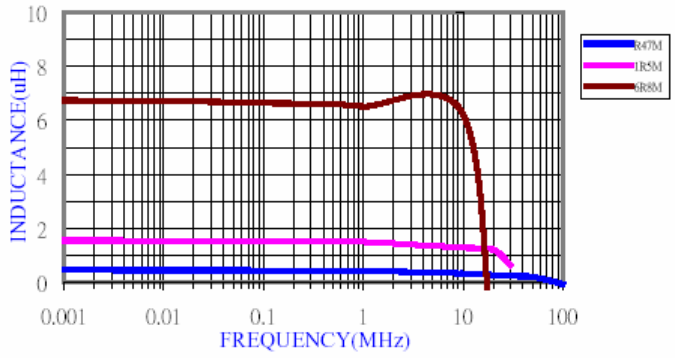
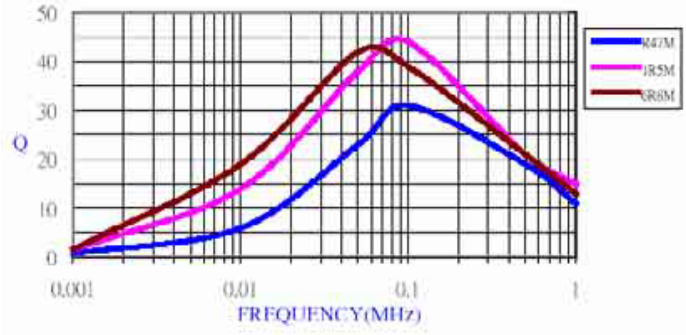
8. CHARACTERISTICS CURVES :

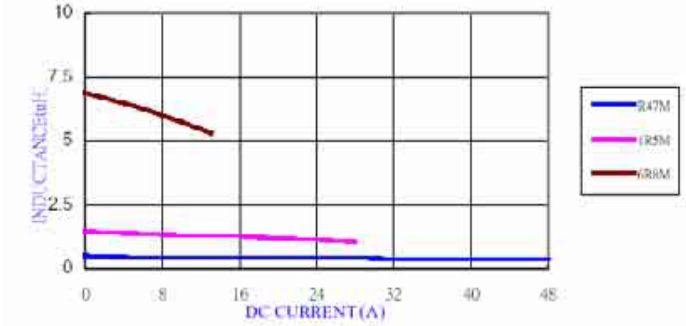
INDUCTANCE VS. FREQUENCY



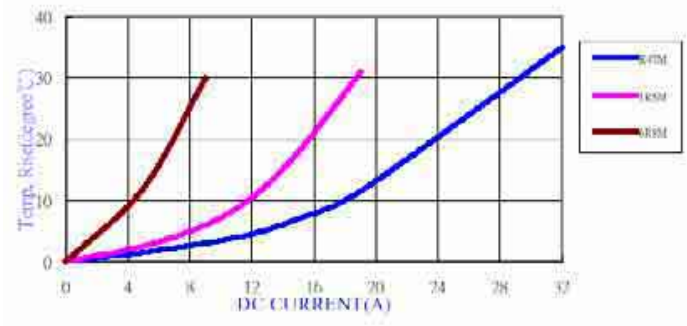
Q VS. FREQUENCY



INDUCTANCE VS. DC CURREN



TEMP. RISE VS. DC CURRENT



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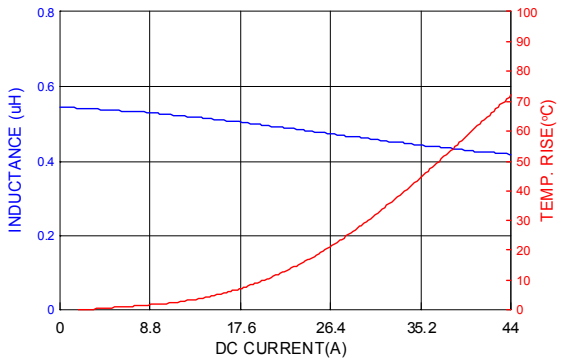
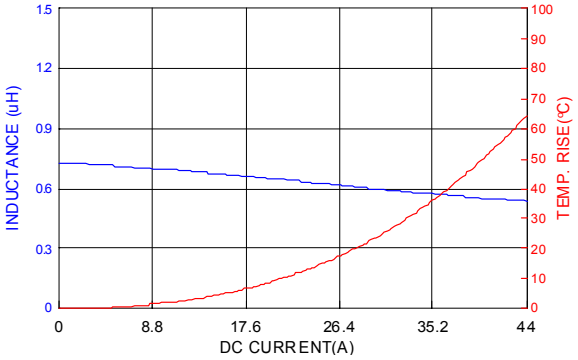
8. CHARACTERISTICS CURVES :

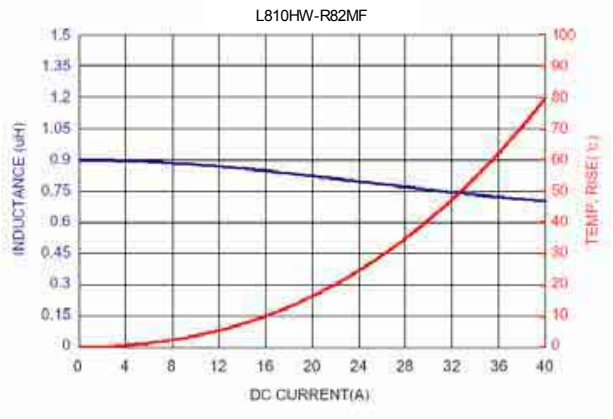
L810HW-R47MF



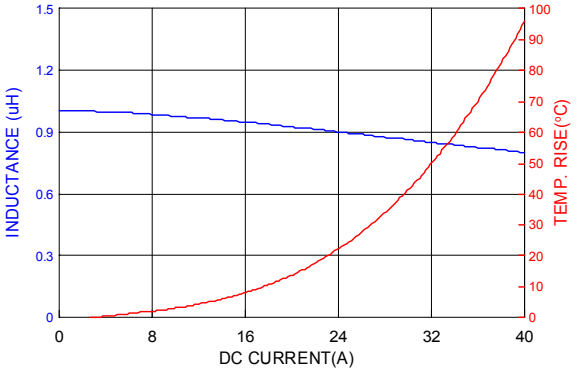
L810HW-R68MF



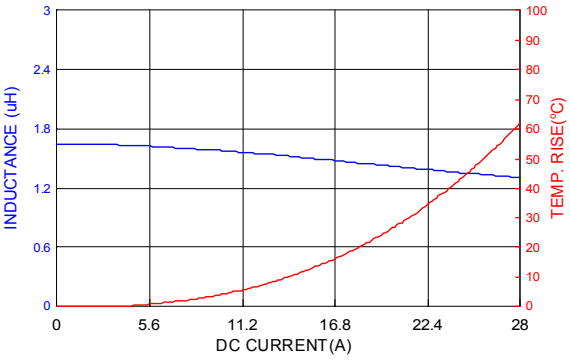
L810HW-R82MF



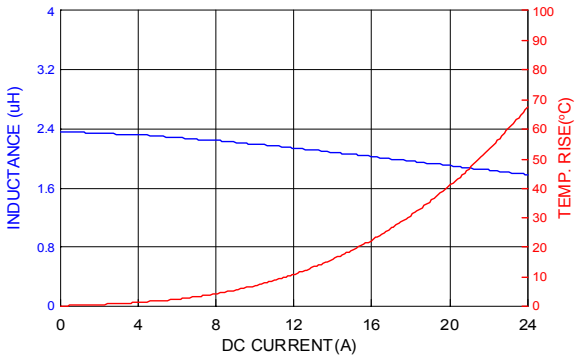
L810HW-1R0MF



L810HW-1R5MF



L810HW-2R2MF



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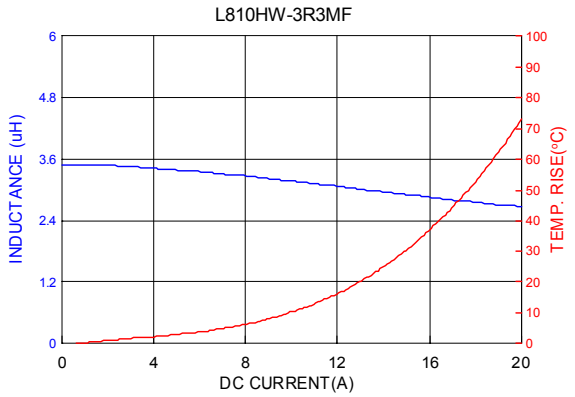
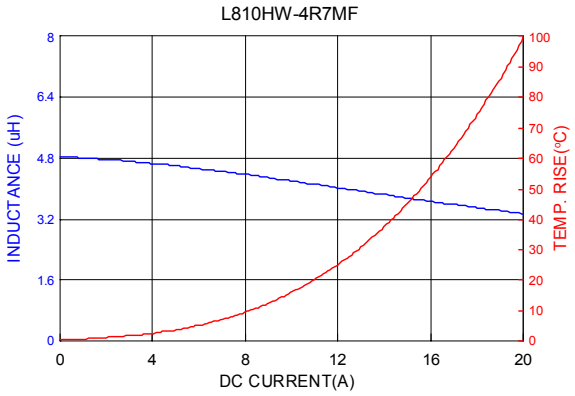
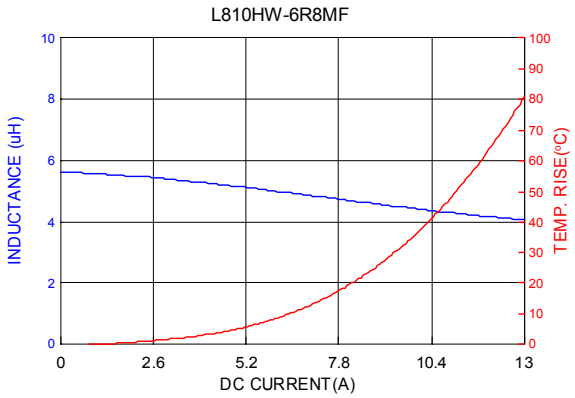
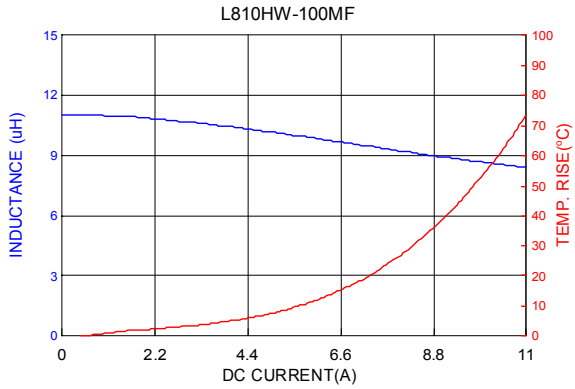
8. CHARACTERISTICS CURVES :









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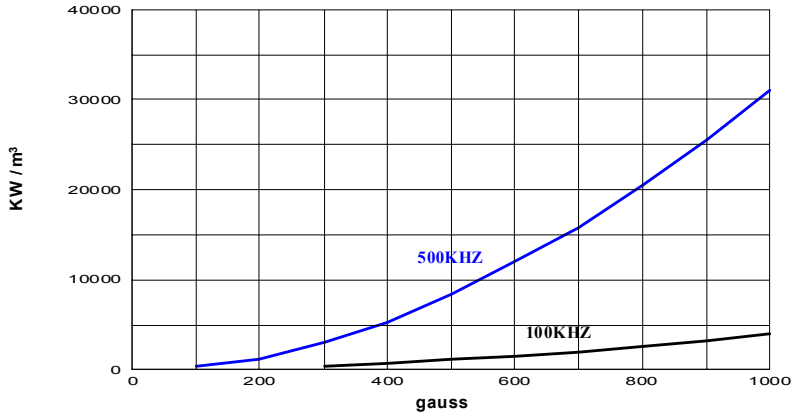
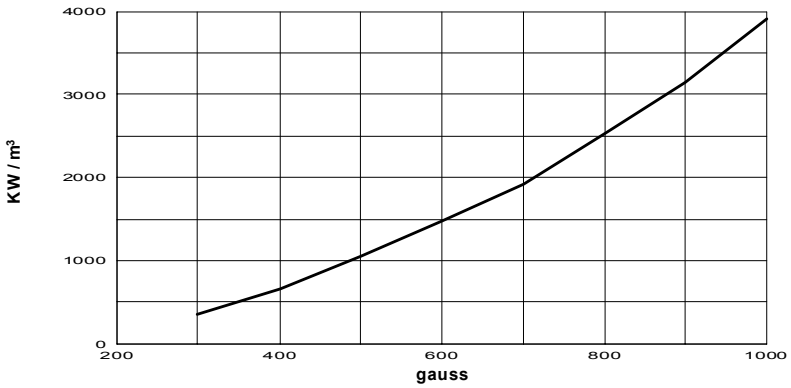
9. CORE LOSS :

100KHz and 500KHz



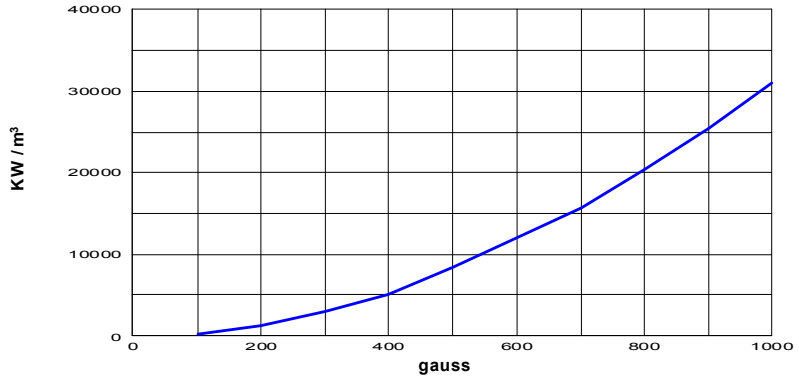
material / gauss \ loss	100KHz	500KHz
100	-	266
200	-	1,234
300	351.7	2,932
400	665.9	5,195
500	1,039	8,336
600	1,471	12,025
700	1,923	15,715
800	2,537	20,444
900	3,148	25,429
1000	3,902	31,002

100KHz



material / gauss \ loss	100KHz
300	351.7
400	665.9
500	1,039
600	1,471
700	1,923
800	2,537
900	3,148
1000	3,902

500KHz



material / gauss \ loss	500KHz
100	266
200	1,234
300	2,932
400	5,195
500	8,336
600	12,025
700	15,715
800	20,444
900	25,429
1000	31,002

Pb

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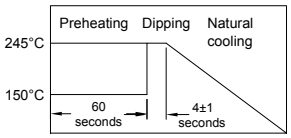
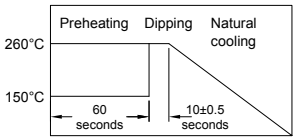
10. RELIABILITY AND TEST CONDITION :

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th><th>TEST CONDITION</th></tr>
<tr><td colspan="3">Electrical Characteristics Test</td></tr>
<tr><td>Inductance</td><td rowspan="2">Refer to standard electrical characteristics list</td><td>HP4284A, CH11025, CH3302, CH1320, CH1320S
LCR meter.</td></tr>
<tr><td>DCR</td><td>CH16502, Agilent33420A Micro-Ohm Meter.</td></tr>
<tr><td>Heat Rated Current (Irms)</td><td></td><td>Irms(A) will cause the coil temperature rise
approximately ΔT=40°C without core loss
1. Applied the allowed DC current
2. Temperature measured by digital surface thermometer</td></tr>
<tr><td>Saturation Current (Isat)</td><td></td><td>Isat(A) will cause Lo to drop approximately 20%</td></tr>
<tr><td colspan="3">Mechanical Performance Test</td></tr>
<tr><td>Solderability Test</td><td>More than 90% of the terminal electrode
should be covered with solder.

</td><td>Preheat : 150°C, 60sec.
Solder : Sn99.95-Cu0.05
Solder Temperature : 245±5°C
Flux for lead free : rosin
Dip Time : 4±1sec.</td></tr>
<tr><td>Solder Heat Resistance</td><td>1. Appearance : No significant abnormality
2. Inductance change : Within ±20%

</td><td>Preheat : 150°C, 60sec.
Solder : Sn99.95-Cu0.05
Solder Temperature : 260±5°C
Flux for lead free : rosin
Dip Time : 10±0.5sec.</td></tr>
<tr><td>Reliability Test</td><td></td><td></td></tr>
<tr><td>High Temperature
Life Test</td><td rowspan="3">1. Appearance : No damage
2. Inductance : Within ±20% of initial value.
No disconnection or short circuit.</td><td>Temperature : 125±5°C
Time : 500±12 hours
Measure at room temperature after placing for 2 to 3 hrs.</td></tr>
<tr><td>Low Temperature
Life Test</td><td>Temperature : -55±5°C
Time : 500±12 hours
Measure at room temperature after placing for 2 to 3 hrs.</td></tr>
<tr><td>Thermal Shock</td><td>Conditions of 1 cycle.
<table>
<tr><th>Step</th><th>Temperature (°C)</th><th>Times (min.)</th></tr>
<tr><td>1</td><td>-55±3</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±3</td><td>30±3</td></tr>
<tr><td>4</td><td>Room Temperature</td><td>Within 3</td></tr>
</table>
Total : 5 cycles
Measure at room temperature after placing for 2 to 3 hrs.</td></tr>
<tr><td>Humidity Resistance</td><td>1. Appearance : No damage
2. Inductance : Within ±20% of initial value.
No disconnection or short circuit.</td><td>Temperature : 40±5°C
Humidity : 90% to 95%
Applied Current : Rated Current
Time : 500±12 hours
Measure at room temperature after placing for 2 to 3 hrs.</td></tr>
<tr><td>Random Vibration Test</td><td>Appearance : Cracking, shipping and any other defects harmful to the characteristics should not be allowed.</td><td>Frequency : 10-55-10Hz for 1 min.
Amplitude : 1.52mm
Directions & times : X, Y, Z directions for 2 hours.
A period of 2 hours in each of 3 mutually perpendicular directions (Total 6 hours).</td></tr>
</table>

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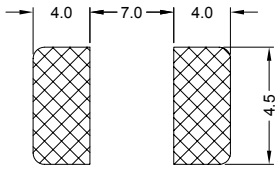
11. SOLDERING AND MOUNTING :

11-1. Recommended PC Board Pattern



11-2. 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. Our 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.

11-2.1 Solder Re-flow :

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

11-2.2 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) 280°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 3 secs.

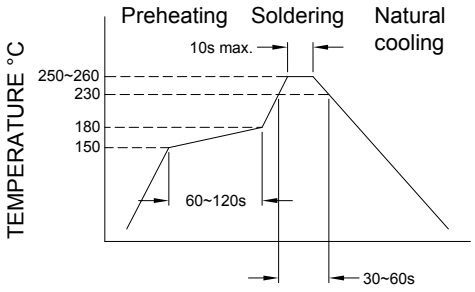


Figure 1. Re-flow Soldering

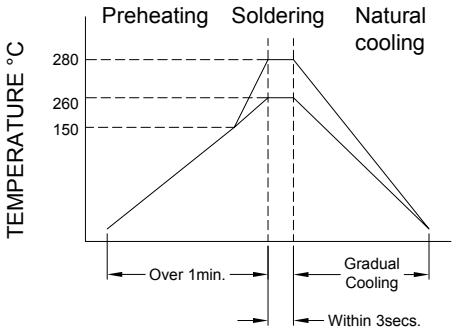


Figure 2. Iron Soldering

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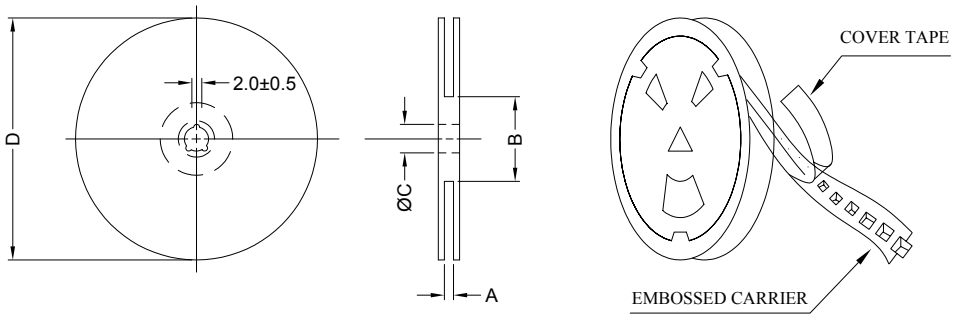
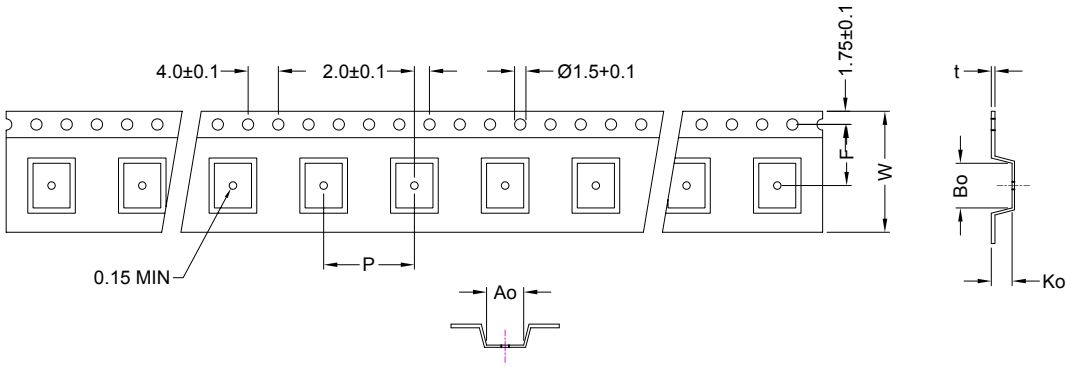
12. PACKAGING INFORMATION :

12-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13" x 24mm	24.0±0.5	100±2.0	13.5±0.5	330

12-2 Tape Dimension



Series	Ao(mm)	Bo(mm)	Ko(mm)	P(mm)	W(mm)	F(mm)	t(mm)
L810HW	13.5±0.1	13.9±0.1	4.5±0.1	16.0±0.1	24.0±0.3	11.5±0.1	0.35±0.05

12-3. Packaging Quantity

Size	L810HW
Chip / Reel	600
Inner Box	1200
Carton	4800

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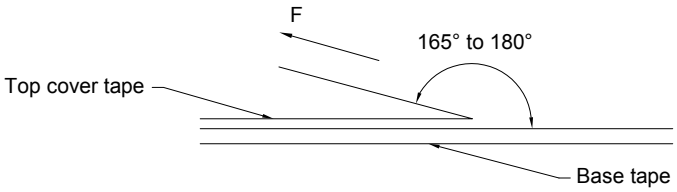
12-4. Tearing Off Force



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 solderabililty of terminal electrodes :
   a) Temperature and humidity conditions : Less than 30°C and 70% RH.
   b) Recommended products should be used within 6 months from the time of delivery.
   c) The packaging material should be kept where no chlorine or sulfur exists in the air.

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

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