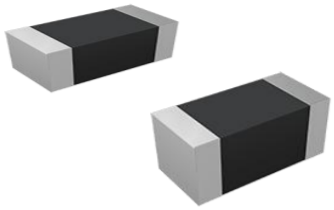
Multilayer Chip Power Inductor
叠层片式功率电感 - APMLP-H Series

FEATURES 特征

- Monolithic strucure for high reliability.
  选层独石结构 、高度可靠性
- Excellent solderability and high heat resistance.
  良好的可焊性和耐焊性
- No cross coupling due to magnetic shield.
  良好的磁屏蔽，无交叉耦合
- Operating Temp：-40℃~+125℃(Including self heating)
  工作温度范围:-40~+125°℃(包括自身温度上升)
- Higher DC bias current and lower DC resistance.
  高偏置电流，低直流电阻



APPLICATIONS 用途

- Mobile phones,mobile PC,wearable devices,seourity monitoring DC-DC converter for other
  应用于手机、移动 PC、可穿戴设备、安防监控等领域的 DC-DC 转换器电路

PART NUMBERING 产品型号

APMLP	2016	H	2R2	M	T	0S1
①	②	③	④	⑤	⑥	⑦

① Series Name	
APMLP	Multilayer Chip Power Inductor

② External Dimensions [inch]
1608 [0603]
2012 [0805]
2016 [0806]
2520 [1008]

③ Characteristic type
H

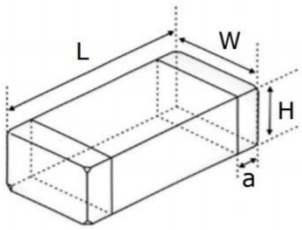
④ Inductance	
Code (example)	Nominal inductance [μH]
1R0	1.0μH
2R2	2.2μH

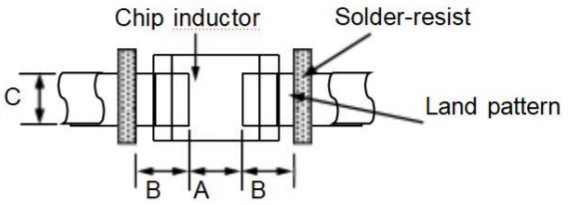
⑤ Height	
B	0.95mm Max.
M	1.0mm Max.
S	1.2mm Max.

⑥ Packaging	
T	Tape & Reel

⑦ Internal code
0S1

DIMENSIONS & RECOMMENDED LAND PATTERN 尺寸及推荐焊盘





Unit: mm

Series	L	W	H	a	A	B	C
APMLP1608H	1.60±0.15	0.8±0.15	0.8±0.15	0.3±0.2	0.6~0.8	0.6~0.8	0.6~0.8
APMLP2012H	2.0 (+0.3,-0.1)	1.25±0.2	0.9±0.1	0.5±0.3	0.8~1.2	0.8~1.2	0.9~1.6
APMLP2016H	2.0 (+0.3, -0.1)	1.6±0.2	0.9±0.1	0.5±0.3	0.8~1.2	0.8~1.2	1.2~2.0
APMLP2520H	2.5±0.2	2.0 (+0.3,-0.1)	0.9±0.1 1.1±0.1	0.5±0.3	1.0~1.4	0.6~1.0	1.8~2.2

ELECTRICAL CHARACTERISTICS 特性规格表

Part Number	Inductance @1MHz,50mV (μH ±20%)	DC resistance (Ω)		Temperature Rise Current (mA)	Saturation Current (mA)		S.R.F (MHz)	Thickness (mm)
		Typ.	Max.	Max.	Typ.	Max.	Min.	
APMLP1608H2R2BT0S1	2.2	0.3	0.38	750	120	100	40	0.8±0.15
APMLP2012HR47MT0S1	0.47	0.08	0.1	1500	1200	1000	100	0.9±0.1
APMLP2012H1R0MT0S1	1	0.11	0.14	1300	1150	950	60	0.9±0.1
APMLP2012H1R5MT0S1	1.5	0.16	0.2	1100	800	700	50	0.9±0.1
APMLP2012H2R2MT0S1	2.2	0.2	0.25	900	500	420	40	0.9±0.1
APMLP2016HR47MT0S1	0.47	0.06	0.075	1600	1300	1050	100	0.9±0.1
APMLP2016H1R0MT0S1	1	0.09	0.12	1400	900	700	70	0.9±0.1
APMLP2016H1R5MT0S1	1.5	0.11	0.14	1200	700	550	60	0.9±0.1
APMLP2016H2R2MT0S1	2.2	0.11	0.14	1200	450	350	50	0.9±0.1
APMLP2016H3R3MT0S1	3.3	0.12	0.15	1200	250	200	40	0.9±0.1
APMLP2016H4R7MT0S1	4.7	0.14	0.18	1100	180	150	30	0.9±0.1
APMLP2520HR47MT0S1	0.47	0.04	0.05	1800	1500	1300	105	0.9±0.1
APMLP2520H1R0MT0S1	1	0.06	0.075	1600	900	700	60	0.9±0.1
APMLP2520H2R2MT0S1	2.2	0.08	0.1	1300	550	450	40	0.9±0.1
APMLP2520H3R3MT0S1	3.3	0.1	0.13	1200	250	200	30	0.9±0.1
APMLP2520H4R7MT0S1	4.7	0.11	0.14	1100	200	160	25	0.9±0.1
APMLP2520H1R0ST0S1	1	0.085	0.11	2100	2100	1750	85	1.1±0.1
APMLP2520H2R2ST0S1	2.2	0.12	0.15	1000	900	700	40	1.1±0.1
APMLP2520H4R7ST0S1	4.7	0.14	0.18	900	350	280	25	1.1±0.1

- Rated current:Saturation Current or Temperature Rise Current,whichever is smaller;
- Saturation Current:DC current at which the inductance drops approximate 30%from its value without current;
- Temperature Rise Current :DC current that causes the temperature rise(△T=40℃)from 20℃ ambient.

RELIABILITY TEST 可靠性测试

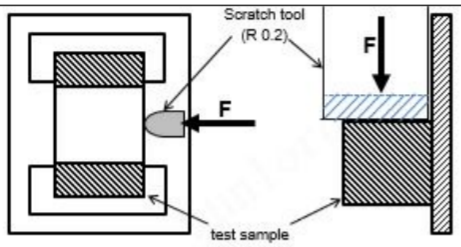
<table>
<tr><th>Items</th><th>Requirements</th><th>Test Methods and Remarks</th></tr>
<tr><td>1.
Terminal
Strength</td><td>No removal or split of the termination or other defects shall occur.
 

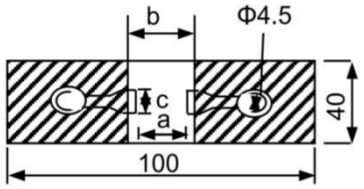
Fig.1-1</td><td>① Solder the inductor to the testing jig (glass epoxy board
shown in Fig.1-1) using leadfree solder. Then apply a
10N force in the direction of the arrow.
② Keep time: 10±1s.
③ Speed: 1.0mm/s.
④ The Scratch tool shall be keep a distance of 0.1mm from the
Board。</td></tr>
<tr><td>2.
Resistance
to Flexure</td><td>No visible mechanical damage.
Unit: mm
<table>
<tr><th>Type</th><th>a</th><th>b</th><th>c</th></tr>
<tr><td>APMLZ1608</td><td>1.0</td><td>3.0</td><td>1.2</td></tr>
<tr><td>APMLZ2012</td><td>1.2</td><td>4</td><td>1.65</td></tr>
</table>


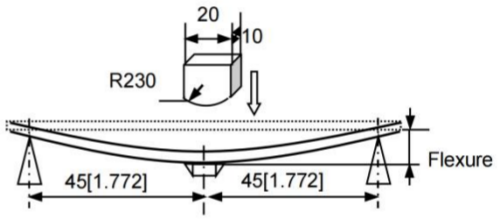
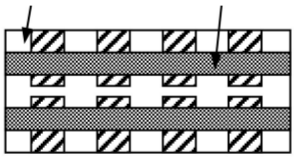
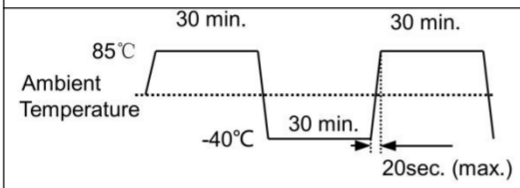
Fig.2-1</td><td>① Solder the inductor to the test jig (glass epoxy board shown in Fig.2-1) Using a leadfree solder. Then apply a force in the direction shown Fig.2-2.
② Flexure: 2mm.
③ Pressurizing Speed: 0.5mm/sec.
④ Keep time: 30 sec.
 

Fig.2-2</td></tr>
<tr><td>3.
Vibration</td><td>① No visible mechanical damage.
② Inductance change: Within ±20%.
Cu pad Solder mask
 
Glass Epoxy Board
Fig. 3-1</td><td>① Solder the inductor to the testing jig (glass epoxy board shown in Fig.3-1) using leadfree solder.
② The inductor 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 3mutually perpendicular directions (total of 6 hours).</td></tr>
<tr><td>4.
Dropping</td><td>① No visible mechanical damage.
② Inductance change: Within ±20%.</td><td>Drop chip inductor 10 times on a concrete floor from a height of 100 cm.</td></tr>
<tr><td>5.
Temperature</td><td>Inductance change should be within ±20% of initial value measuring at 20℃ .</td><td>Temperature range: -40℃~ +85℃
Reference temperature: +20℃</td></tr>
<tr><td>6.
Solderability</td><td>① No visible mechanical damage.
② Wetting shall exceed 95% coverage.</td><td>① Solder temperature: 240±2℃
② Duration: 3 sec.
③ Solder: Sn/3.0Ag/0.5Cu.
④ Flux: 25% Resin and 75% ethanol in weight.</td></tr>
</table>

RELIABILITY TEST 可靠性测试

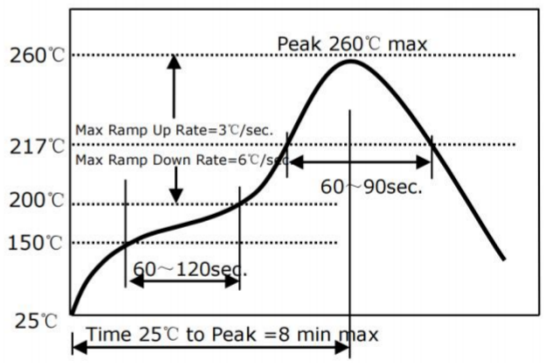
Items	Requirements	Test Methods and Remarks
7. Resistance to Soldering Heat	① No visible mechanical damage. ② Wetting shall exceed 95% coverage. ③ Inductance change: Within ±20%.	① Solder temperature: 260±3℃ . ② Duration: 5 sec. ③ Solder: Sn/3.0Ag/0.5Cu. ④ Flux: 25% Resin and 75% ethanol in weight. ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
8. Thermal Shock	① No mechanical damage. ② Inductance change: Within ±20%.  **Fig.8-1**	① Temperature, Time: (See **Fig.8-1**) -40℃ for 30±3 min→ 85℃ for 30±3min. ② Transforming interval: 20 sec.(max.). ③ Tested cycle: 100 cycles. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
9. Resistance to Low Temperature	① No mechanical damage. ② Inductance change: Within ±20%.	① Temperature: -40±2℃ ② Duration: 1000+24 hours. ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.

Recommended Soldering Technologies 回流焊建议

Reflowing Profile

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

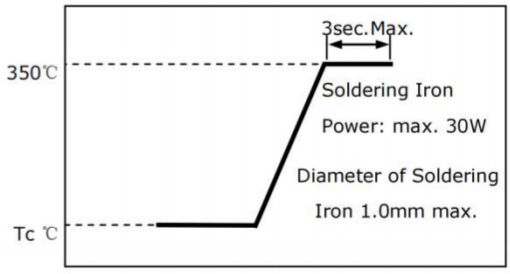
Note: The reflow profile in the above table is only for qualification and is not meant to specify board assembly profiles. Actual board assembly profiles must be based on the customer's specific board design, solder paste and process, and should not exceed the parameters as the Reflow profile shows.



Iron Soldering Profile

- Iron soldering power: Max.30W
- Pre-heating: 150 ℃ / 60sec.
- Soldering Tip temperature: 350℃Max.
- 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.



Safety Reminders 注意事项

SAFETY REMINDERS

- The storage period is within 12 months. Be sure to follow the storage conditions (temperature: 15 to 35℃, humidity: 75% RH or less).If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications. If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- When embedding a printed circuit board where a chip is mounted to a set, be sure that residual stress is not given to the chip due to the overall distortion of the printed circuit board and partial distortion such as at screw tightening portions.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- This product is not designed for production processes involving ultrasonic welding, as high-frequency vibration may cause application issues such as product detachment and breakage.
- Carefully layout the coil for the circuit board design of the non-magnetic shield type. A malfunction may occur due to magnetic interference.
- Use a wrist band to discharge static electricity in your body through the grounding wire.
- Do not expose the products to magnets or magnetic fields.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in general electronic equipment, under a normal operation and use condition.

The Company shall not guarantee the suitability, performance, or quality for the following applications that require a high level of safety and reliability, or where equipment failure, malfunction, or abnormal operation may cause damage to human life, physical well-being, or property, and may have significant social impacts (hereinafter referred to as "specific applications").If you intend to use this product in the application scenarios listed below, or if you have special requirements exceeding the scope or conditions specified in each product catalog, please contact us.

(1) Aerospace/aviation equipment
(2) Transportation equipment (cars, electric trains, ships, etc.)
(3) Medical equipment
(4) Power-generation control equipment
(5) Atomic energy-related equipment
(6) Seabed equipment
(7) Transportation control equipment
(8) Public information-processing equipment
(9) Military equipment
(10) Electric heating apparatus, burning equipment
(11) Disaster prevention/crime prevention equipment
(12) Safety equipment
(13) Other applications that are not considered general-purpose applications

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.