

FEATURES 特征

- Very large rated current and low direct-current resistance.
超高额定电流，低内阻
- No cross coupling due to magnetic shield.
采用磁屏蔽设计，无交叉耦合问题
- Perfect shape for mounting with no directionality.
外形设计优化，安装无方向性限制
- Superior solderability and resistance to soldering heat ,suitable for reflow soldering.
优良的可焊性及耐热冲击性，适合回流焊
- Operating Temp : -40℃~+85℃(Including self heating)
工作温度范围:-40~+85℃(包括自身温度上升)



APPLICATIONS 用途

- Widely use in DC-DC conversion circuits in products such as communication equipment,wearable devices,DVCs,and HDDs.
广泛应用于通信设备、可穿戴设备、DVCs、HDDs等产品的DC-DC转换电路

PART NUMBERING 产品型号

APLH	2012	-	2R2	M	P	T	D9
①	②		③	④	⑤	⑥	⑦

① Series Name	
APLH	Multilayer Chip Ferrite Power Inductors

② External Dimensions [inch]	(L×W) (mm)
1608 [0603]	1.6×0.8
2012 [0805]	2.0×1.2
2016 [0806]	2.0×1.6
2520 [1008]	2.5×2.0

③ Inductance	
Code (example)	Nominal inductance [μH]
R47	0.47
4R7	4.7

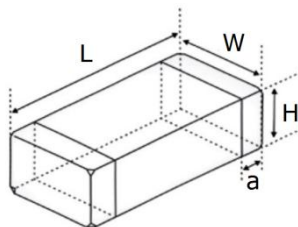
④ Inductance Tolerance	
M	±20%

⑥ Packaging	
T	Tape & Reel

⑤ Characteristics Code	
L、P、S	

⑦ Special Material Code	
D9	

■ DIMENSIONS 尺寸



Unit: mm [inch]

Dimensions				
Series	L	W	H	a
APLH1608 [0603]	1.6± 0.20 [0.063± 0.008]	0.8± 0.20 [0.031± 0.008]	0.8± 0.20 [0.031± 0.008]	0.3± 0.2 [0.01± 0.008]
APLH2012 [0805]	2.0± 0.20 [0.079± 0.008]	1.2± 0.20 [0.047± 0.008]	0.9± 0.20 [0.035± 0.008]	0.5± 0.3 [0.020± 0.012]
APLH2016 [0806]	2.0± 0.20 [0.079± 0.008]	1.6± 0.20 [0.063± 0.008]	0.9± 0.20 [0.035± 0.008]	0.5± 0.3 [0.020± 0.012]
APLH2520 [1008]	2.5± 0.20 [0.098± 0.008]	2.0± 0.30 [0.079± 0.012]	P Series: 0.9± 0.20 [0.035± 0.008]	0.5± 0.3 [0.020± 0.012]
			S Series: 1.1± 0.20 [0.043± 0.008]	

■ ELECTRICAL CHARACTERISTICS 电气特性

● APLH1608 Series

Part Number	Inductance@1MHz (μ H) $\pm 20\%$	Max. DC Resistance (Ω)	Max. Rated Current (mA)	Min. SRF (MHz)
APLH1608-R47MPTD9	0.47	0.13	1100	100
APLH1608-R56MPTD9	0.56	0.156	1100	100
APLH1608-1R0MPTD9	1	0.26	930	98
APLH1608-1R8MPTD9	1.8	0.312	780	95
APLH1608-2R2MPTD9	2.2	0.312	780	95
APLH1608-4R7MPTD9	4.7	0.65	730	65

● APLH2012 Series

Part Number	Inductance@1MHz (μ H) $\pm 20\%$	Max. DC Resistance (Ω)	Max. Rated Current (mA)	Min. SRF (MHz)
APLH2012-1R0MLTD9	1	0.175	310	75
APLH2012-2R2MLTD9	2.2	0.28	230	50
APLH2012-3R3MLTD9	3.3	0.3	210	35
APLH2012-4R7MLTD9	4.7	0.375	190	25
APLH2012-1R0MPTD9	1	0.138	1200	75
APLH2012-2R2MPTD9	2.2	0.25	980	50
APLH2012-3R3MPTD9	3.3	0.275	830	35
APLH2012-4R7MPTD9	4.7	0.375	780	25
APLH2012-6R8MPTD9	6.8	0.375	620	25

ELECTRICAL CHARACTERISTICS 电气特性

● APLH2016 Series

Part Number	Inductance@1MHz (μH) $\pm 20\%$	Max. DC Resistance (Ω)	Max. Rated Current (mA)	Min. SRF (MHz)
APLH2016-1R0MPTD9	1	0.125	1450	70
APLH2016-2R2MPTD9	2.2	0.2	1250	50
APLH2016-3R3MPTD9	3.3	0.25	1250	40
APLH2016-4R7MPTD9	4.7	0.325	1150	30

● APLH2520 Series

Part Number	Inductance@1MHz (μH) $\pm 20\%$	Max. DC Resistance (Ω)	Max. Rated Current (mA)	Min. SRF (MHz)
APLH2520-R47MPTD9	0.47	0.05	1850	100
APLH2520-1R0MPTD9	1	0.075	1650	60
APLH2520-1R5MPTD9	1.5	0.087	1550	50
APLH2520-2R2MPTD9	2.2	0.1	1350	40
APLH2520-3R3MPTD9	3.3	0.13	1250	30
APLH2520-4R7MPTD9	4.7	0.14	1150	25
APLH2520-1R0MSTD9	1	0.12	1550	70
APLH2520-2R2MSTD9	2.2	0.15	1050	40
APLH2520-3R3MSTD9	3.3	0.15	1050	30
APLH2520-4R7MSTD9	4.7	0.18	930	25
APLH2520-100MSTD9	10	0.38	830	15

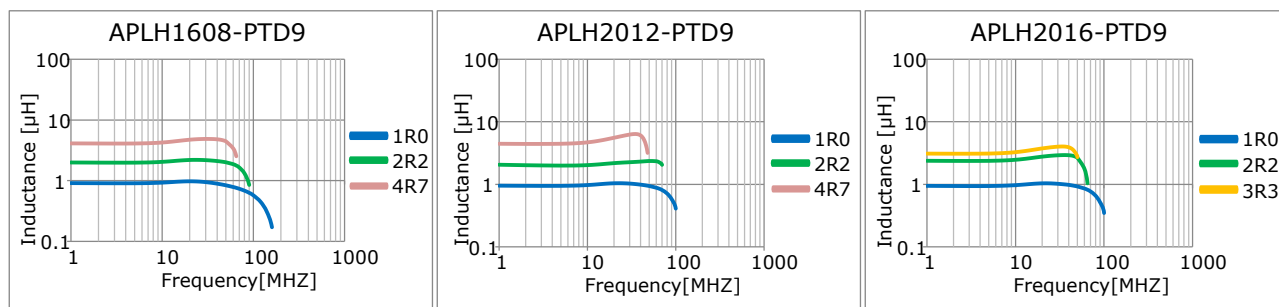
● Inductance testing conditions: E4982A or equivalent, test voltage 50mV $\pm$ 5mV, Temperature 15°C ~35°C, Humidity 25%~75%.

● RDC Testing conditions: RM3542A or equivalent, Temperature 15°C~35°C, Humidity 25%~75%.

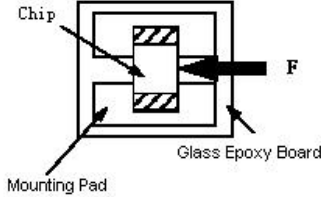
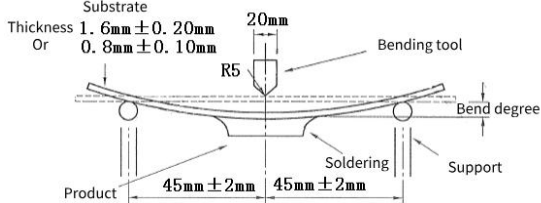
● Rated current:

Apply the rated current for Characteristics Code L series, and the Inductance drops shall not exceed 50%.
Apply the rated current for Characteristics Code P&S series, and the surface temperature rise of the product shall not exceed 40°C.

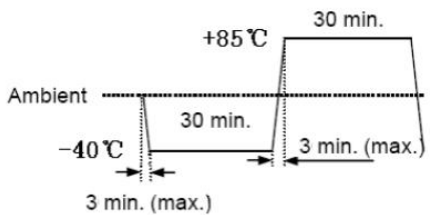
INDUCTANCE VS. FREQUENCY CHARACTERISTICS 感量-频率特性



RELIABILITY TEST 可靠性测试

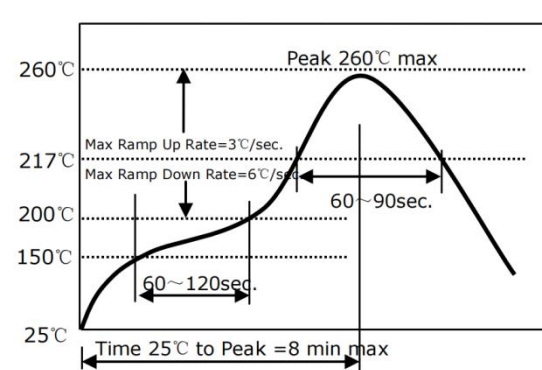
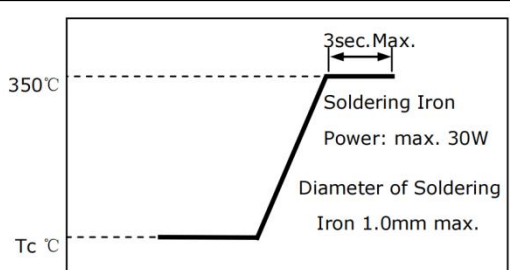
Items	Requirements	Test Methods and Remarks
1. Solder ability	No mechanical damage. 95% or more of electrode area shall be coated by new solder.	Preheating temperature: 120°C to 150°C Preheating time: 60s Solder 96.5%Sn/3.0%Ag/0.5%Cu of the Sn solder. Solder temperature: 245±3°C Immersion tin depth: 10mm Duration : 3±0.3s Dip performance to a flux of about: 3 ~ 5 s
2. Resistance to Soldering Heat	No mechanical damage. Inductance : change within ±30%	Preheating temperature: 120°C to 150°C Preheating time: 60s Solder 96.5%Sn/3.0%Ag/0.5%Cu of the Sn solder. Solder temperature: 260°C±5°C Immersion tin depth: 10mm Duration : 10±1s Dip performance to a flux of about: 3~5 s
3. Adhesion of electrode	The termination and body should be no damage.	Applied force: 7N force for 1608 series : 10N force for 2012、2016、2520 series. Keep time : 10±1S 
4. Low temperature resistance	No mechanical damage. Inductance change: within ±10%	Temperature: -40±2°C Testing time: 1000 h (+24h)
5. Bending strength	No mechanical damage.	Testing board: glass epoxy-resin substrate For (1±0.5) mm/s compression speed, curvature: 2mm, hold time 20s±1s . 
6. Vibration	No mechanical damage. Inductance change: within ±20%	Amplitude modulation: 1.5mm Test time: A period of 2h in each of 3 mutually perpendicular directions. Frequency range: 10Hz to 55Hz to 10Hz for 1min.
7. High temperature resistance	No mechanical damage. Inductance change: within ±10%	Testing time: 1000 h (+24h) Temperature: 85±2°C
8. Static Humidity	No mechanical damage. Inductance change: within ±10%	Humidity: 90% to 95% RH Temperature: 60°C±2°C Testing time: 1000 h (+24h)

RELIABILITY TEST 可靠性测试

Items	Requirements	Test Methods and Remarks
9. High temperature load	No mechanical damage. Inductance change: within $\pm 10\%$	impose current: at room Testing time: 1000 h (+24h) Temperature: $85 \pm 2^\circ\text{C}$
10. Temperature Shock	No mechanical damage. Inductance change: within $\pm 10\%$	Temperature: -40°C for $30 \pm 3\text{min}$ $+85^\circ\text{C}$ for $30 \pm 3\text{min}$ Number of cycles: 32 

Note: When there are questions concerning, measurement shall be made after $24 \pm 2\text{hrs}$ of recovery under the standard condition.

Recommended Soldering Technologies 回流焊建议

Reflowing Profile	
◆ Preheat condition: $150 \sim 200^\circ\text{C} / 60 \sim 120\text{sec}$. ◆ Allowed time above 217°C: $60 \sim 90\text{sec}$. ◆ 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.	
Iron Soldering Profile	
◆ Iron soldering power: Max.30W ◆ Pre-heating: $150^\circ\text{C} / 60\text{sec}$. ◆ Soldering Tip temperature: 350°C 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°C, 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.

All products listed in this specification are developed, designed and intended for use in general electronics equipment. The products are not designed or Warranted to meet the requirements of the applications listed below, whose performance and/or quality require especially high reliability, or whose failure, malfunction or trouble might directly cause damage to society, person, or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below. Please contact us for more details if you intend to use our products in the following applications.

- (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.