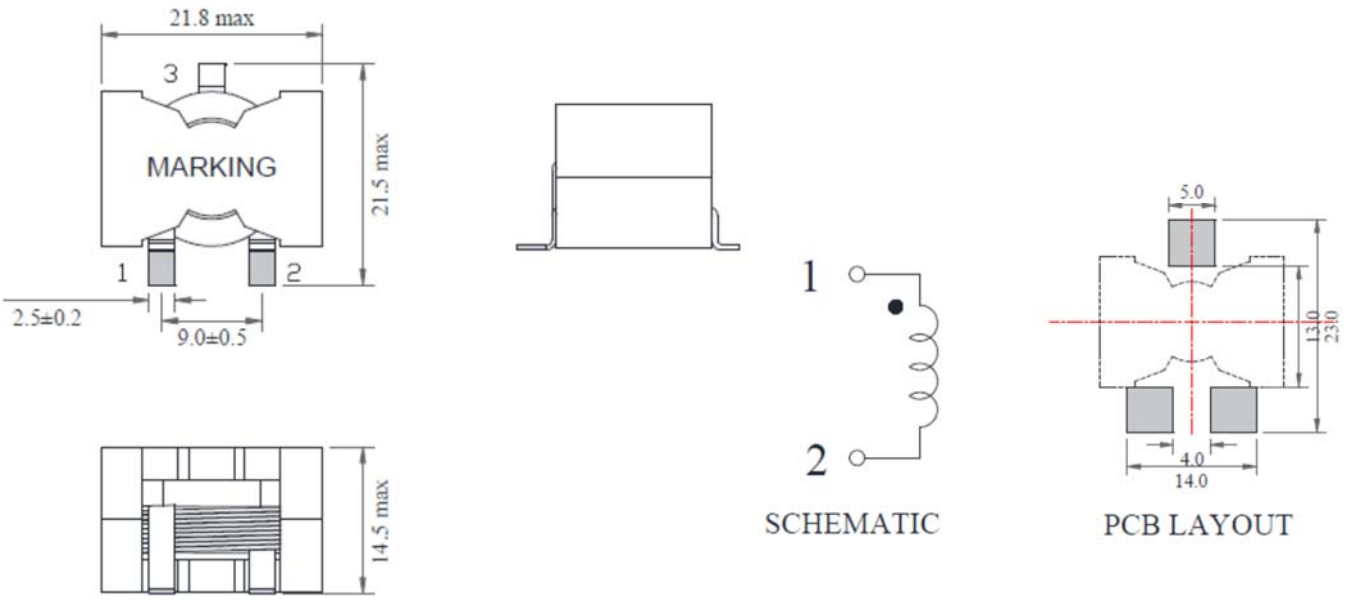
FEATURES

- Susing flat wire, and SMD type.
- Low radiation noise by magnetically shielded construction
- High current, Low resistance.
- Operating temperature : -40℃~+125℃.

APPLICATIONS

- high efficiency DC/DC converters.
- Single and polyphase buck converters.
- Filter for audio applications.
- Optimized for high current boost applications.

CONFIGURATIONS & DIMENSIONS (unit in mm)



ELECTRICAL CHARACTERISTICS

Part number	Inductance μH	DC resistance mΩ max. (typ.)	DC saturation current A max.(typ.)			Temperature rise current A max.(typ.)	
			△L≦10%	△L≦20%	△L≦30%	△T≦20℃	△T≦40℃
HAPH20-701M	0.7±20%	1.0(0.7)	70(75)	75(79)	77.5(81)	22	28
HAPH20-152M	1.5±20%	1.3(1.05)	57(60)	60(63.5)	62(65.2)	21	26.5
HAPH20-222M	2.2±20%	1.8(1.5)	48(51.5)	52(56)	53.5(57)	20	25
HAPH20-332M	3.3±20%	2.5(2.1)	40(44)	45(47)	46.5(48)	18.5	23.5

HAPH20-472M	4.7±20%	3.6(3.1)	30(34.5)	35(37)	36.5(38)	15.5	22
HAPH20-682M	4.7±20%	6.8(5.2)	25(29.7)	30(32)	31.5(33)	13.5	19
HAPH20-103K	10±10%	9.5(7.3)	18(22.8)	23(24.8)	24(25.6)	10	14
HAPH20-153K	15±10%	10.5(8.7)	17(20.6)	21(22.5)	22(23.4)	9	12.5
HAPH20-223K	22±10%	12.8(10.6)	12.5(15)	15(16.3)	15.8(17.1)	7	11
HAPH20-333K	33±10%	13.7(11.5)	8.5(11)	11(12.1)	11.7(12.9)	6	10

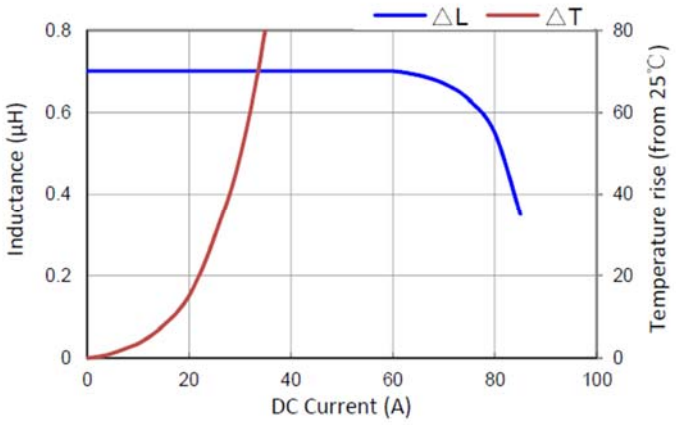
Remark

Inductance is measured with a LCR meter 4284A or equivalent.Test frequency at 100kHz

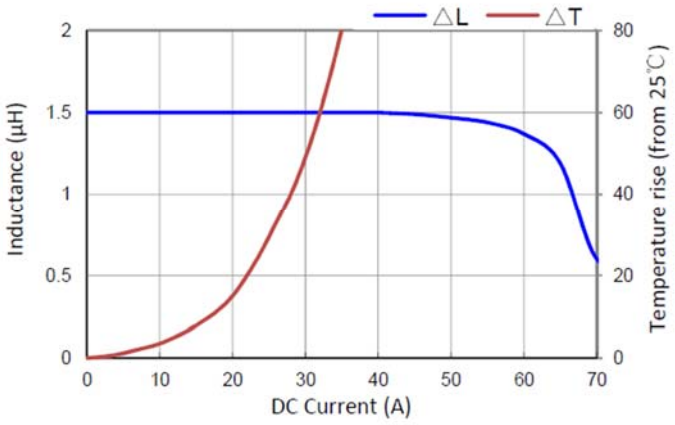
DC resistance is measured with 16502 Milliohm Meter , or equivalent.Reference ambient temperature 25°C

Electrical Characteristic Curve

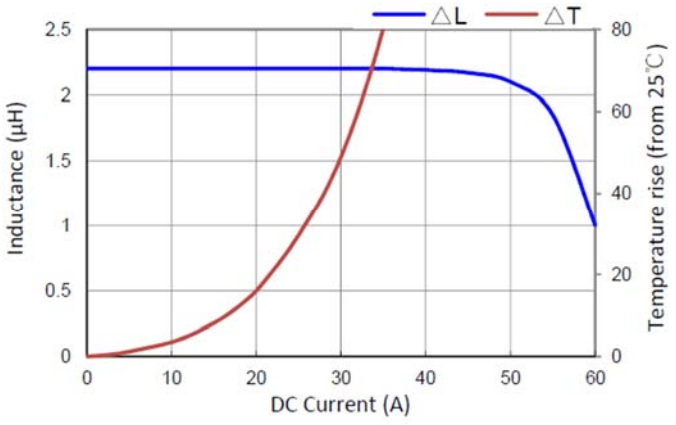
HAPH20-701



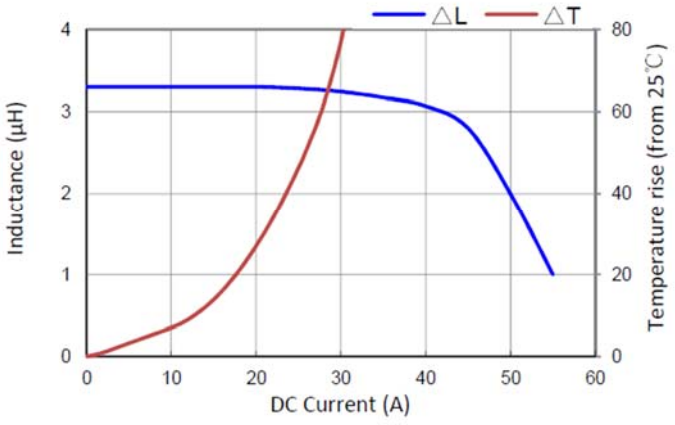
HAPH20-152



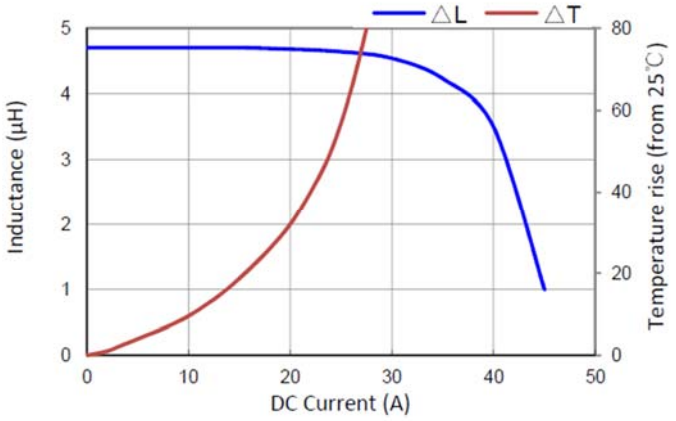
HAPH20-222



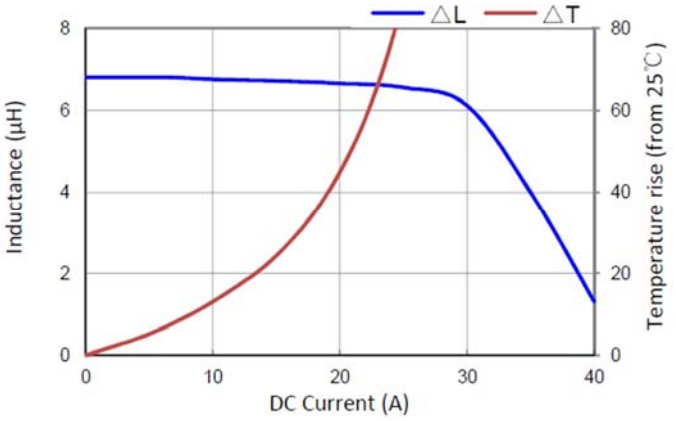
HAPH20-332



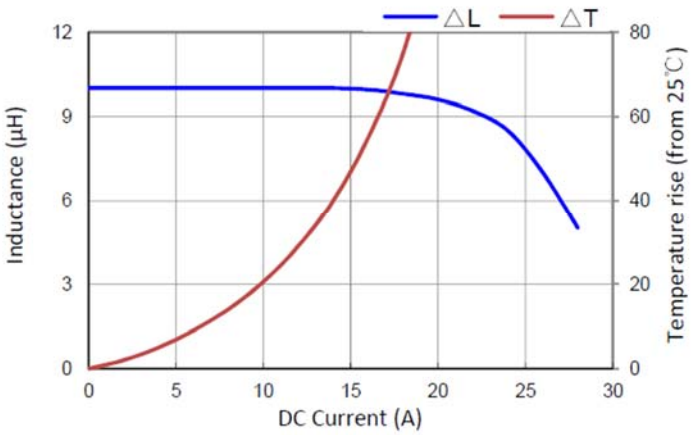
HAPH20-472



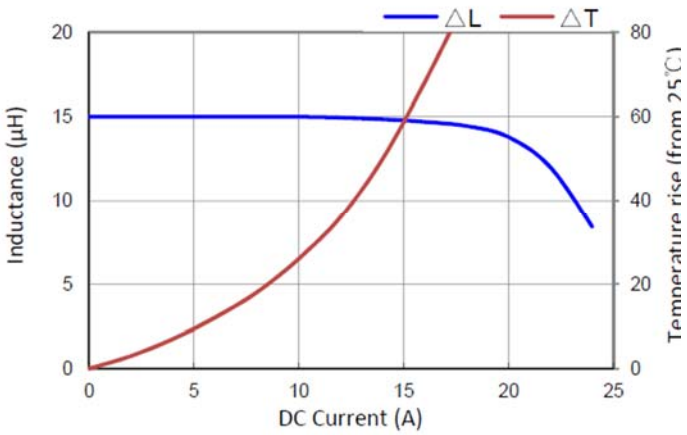
HAPH20-682



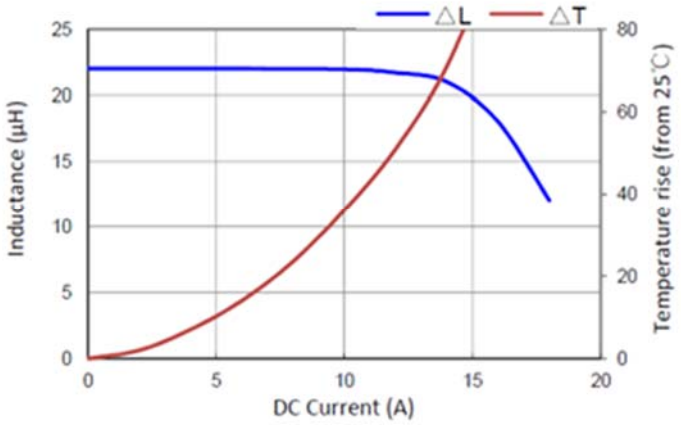
HAPH20-103



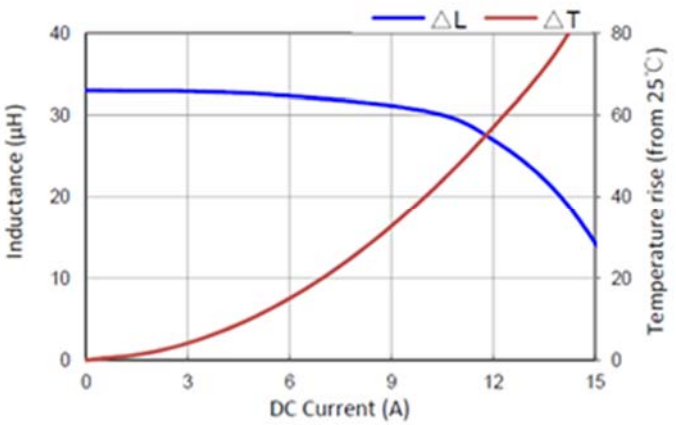
HAPH20-153



HAPH20-223

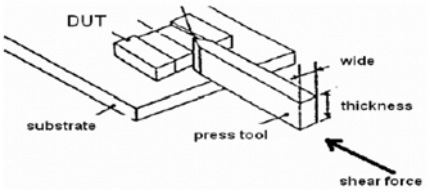


HAPH20-223



Reliability and Test Condition

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Operating temperature</td><td>-40~+125℃ (Including self - temperature rise)</td><td></td></tr>
<tr><td>Storage temperature</td><td>1. -10~+40℃,50~60%RH (Product with taping)
2. -40~+125℃(on board)</td><td></td></tr>
<tr><td colspan="3">Electrical Performance 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>Saturation Current (Isat)</td><td>Approximately△L30%</td><td>Saturation DC Current (Isat) will cause L0
to drop △L(%)</td></tr>
<tr><td>Heat Rated Current (Irms)</td><td>Approximately △T40℃</td><td>Heat Rated Current (Irms) will cause the coil temperature rise △T(℃).
1.Applied the allowed DC current
2.Temperature measured by digital surface thermometer</td></tr>
<tr><td colspan="3">Reliability Test</td></tr>
<tr><td>Life Test</td><td rowspan="5">Appearance：No damage.
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles)
Temperature： 125±2℃(Inductor)
Applied current：rated current
Duration：1000±12hrs
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Load Humidity</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
Humidity：85±2%R.H,
Temperature：85℃±2℃
Duration：1000hrs Min. with 100% rated current
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Moisture Resistance</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow
Profiles
1. Baked at50℃ for 25hrs, measured at room temperature after placing for 4 hrs.
2. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs.
3. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in
2.5hrs,keep at 25℃ for 2 hrs then keep at -10℃ for 3 hrs
4. Keep at 25℃ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at
room temperature after placing for 1~2 hrs.</td></tr>
<tr><td>Thermal
shock</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification
Reflow Profiles
Condition for 1 cycle
Step1：-40±2℃ 30±5min
Step2：25±2℃ ≦0.5min
Step3：125±2℃ 30±5min
Number of cycles： 500
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Vibration</td><td>Oscillation Frequency: 10 ~ 2K ~ 10Hz for 20 minutes
Equipment： Vibration checker
Total Amplitude:1.52mm±10%
Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)。</td></tr>
<tr><td>Bending</td><td rowspan="2">Appearance：No damage.
Impedance：within±15% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm
<0805 inch(2012mm):40x100x0.8mm
Bending depth: >=0805 inch(2012mm):1.2mm
<0805 inch(2012mm):0.8mm
duration of 10 sec.</td></tr>
<tr><td>Shock</td><td>
<table>
<tr><th>Type</th><th>Peak value (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)ft/sec</th></tr>
<tr><td>SMD</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr>
<tr><td>Lead</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr>
</table>
</td></tr>
<tr><td>Solder ability</td><td>More than 95% of the terminal electrode should be covered with solder。</td><td>Preheat: 150℃,60sec.。
Solder: Sn96.5% Ag3% Cu0.5%
Temperature: 245±5℃。</td></tr>
</table>

<table>
<tr><td></td><td></td><td>Flux for lead free: Rosin. 9.5%。
Dip time: 4±1sec。
Depth: completely cover the termination</td></tr>
<tr><td>Resistance to Soldering Heat</td><td rowspan="2">Appearance：No damage.
Impedance：within±15% of initial value
Inductance：within±10% of initial value
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value e</td><td>Depth: completely cover the termination
<table><tr><th>Temperature(°C)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s ±6 mm/s</td><td>1</td></tr></table></td></tr>
<tr><td>Terminal Strength</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
With the component mounted on a PCB with the device to be tested, apply a force(>0805:1kg , <=0805:0.5kg)to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested.
 
</td></tr>
</table>

Note : When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition.