

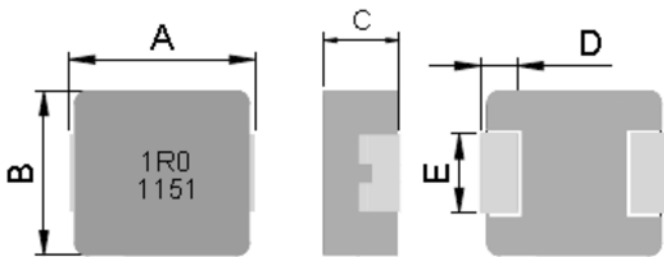
FEATRLRES

- Carbonyl Powder.
- Compact design.
- High current · low DCR · high efficiency.
- Very low acoustic noise and very low leakage flux noise.
- High reliability.
- 100% Lead(Pb)-Free and RoHS compliant.

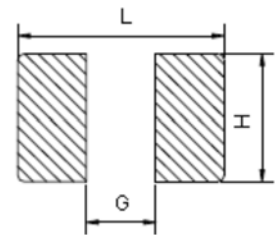
APPLICATIONS

- Note PC power system , incl. IMVP-6
- DC/DC converter .

CONFIGLRATIONS & DIMENSIONS (unit in mm)



Recommended Land pattern



| Type | A | B | C | D | E | L | G | H |
|------------|---------|---------|---------|---------|---------|-----|-----|-----|
| HMPL0512HP | 5.7±0.3 | 5.2±0.2 | 1.0±0.2 | 1.1±0.3 | 2.5±0.3 | 6.2 | 2.2 | 2.8 |

Note:

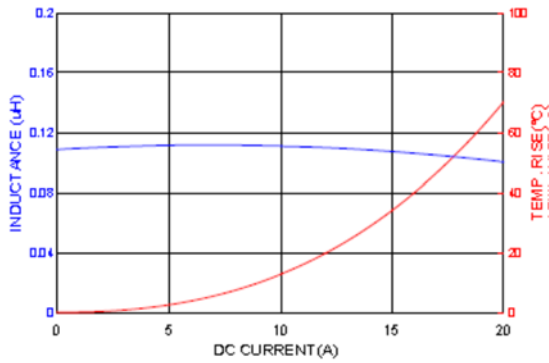
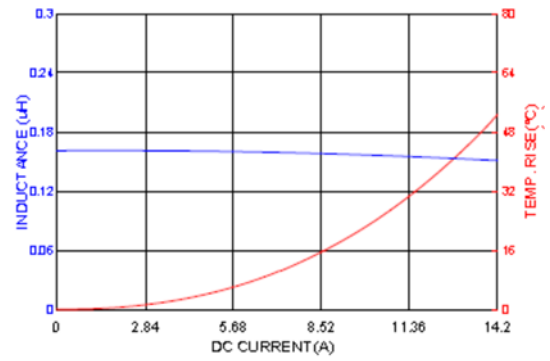
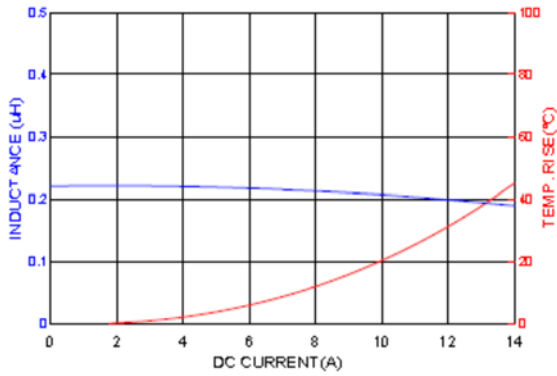
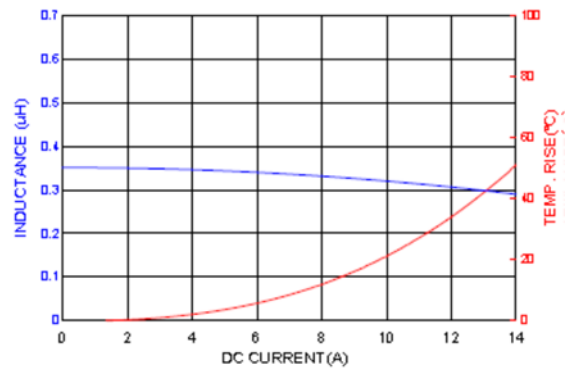
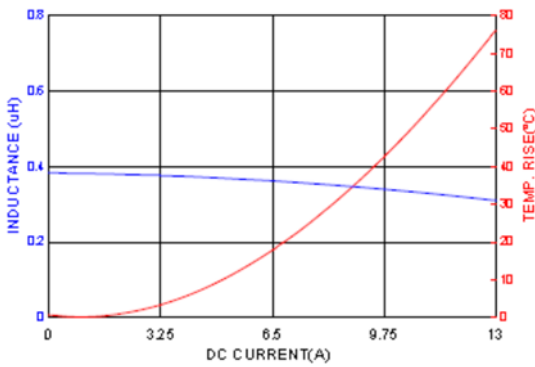
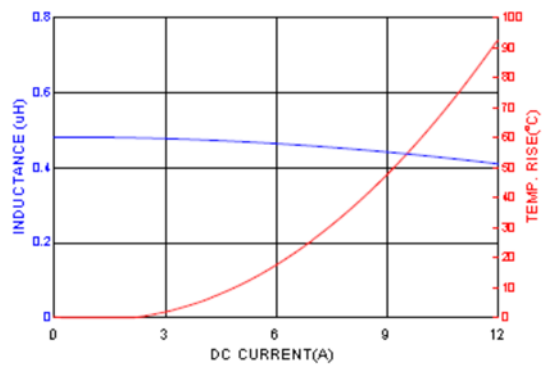
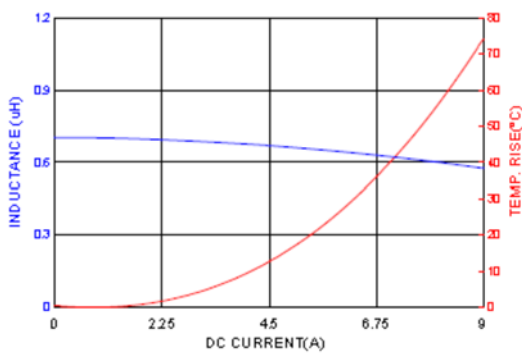
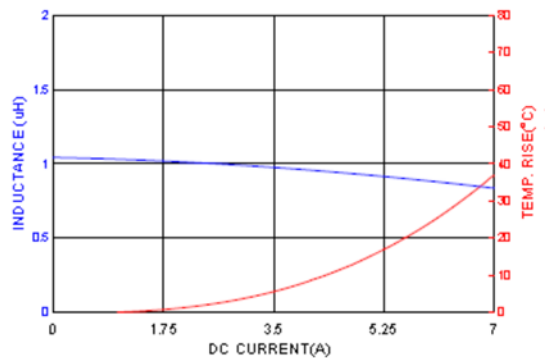
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.12mm and above.

ELECTRICAL CHARACTERISTICS

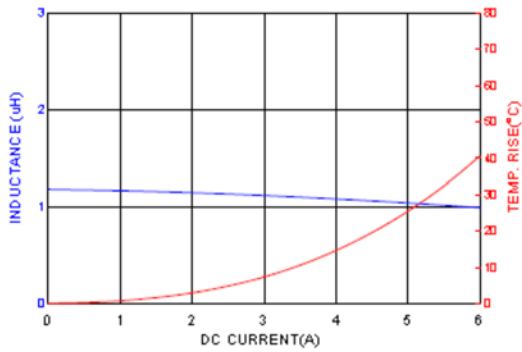
| Part Number | Inductance L0 | I rms (A) Typ. | I sat (A) Typ. | DCR(mΩ) | DCR(mΩ) |
|--------------------|----------------|----------------|----------------|-----------|-----------|
| | (uH)±20% @ 0 A | | | Typ.@25°C | Max.@25°C |
| HMPL0512HP-R10YG-D | 0.10±30% | 14 | 14.5 | 4.3 | 5.2 |
| HMPL0512HP-R15YG-D | 0.15±30% | 12 | 14.2 | 4.5 | 6.0 |
| HMPL0512HP-R22YG-D | 0.22±30% | 10.7 | 14.0 | 5.5 | 6.7 |
| HMPL0512HP-R33MG-D | 0.33 | 8.5 | 13.5 | 7.8 | 9.4 |
| HMPL0512HP-R36MG-D | 0.36 | 8.0 | 13 | 10 | 11.5 |
| HMPL0512HP-R47MG-D | 0.47 | 7.0 | 11 | 13.6 | 15.8 |
| HMPL0512HP-R68MG-D | 0.68 | 6.0 | 9.0 | 21.5 | 24.5 |
| HMPL0512HP-1R0MG-D | 1.00 | 5.0 | 6.0 | 26 | 30 |
| HMPL0512HP-1R2MG-D | 1.20 | 4.5 | 5.5 | 33 | 40 |
| HMPL0512HP-1R5MG-D | 1.50 | 4.0 | 5.0 | 38 | 44 |
| HMPL0512HP-2R2MG-D | 2.20 | 3.5 | 4.0 | 65 | 75 |
| HMPL0512HP-3R3MG-D | 3.30 | 3.0 | 3.8 | 75 | 86 |
| HMPL0512HP-4R7MG-D | 4.70 | 2.5 | 3.2 | 100 | 115 |
| HMPL0512HP-5R6MG-D | 5.60 | 2.4 | 3.2 | 175 | 201 |
| HMPL0512HP-6R8MG-D | 6.80 | 2.0 | 3.0 | 193 | 222 |
| HMPL0512HP-8R2MG-D | 8.20 | 1.7 | 2.8 | 327 | 378 |
| HMPL0512HP-100MG-D | 10.0 | 1.5 | 1.8 | 335 | 385 |

Note:

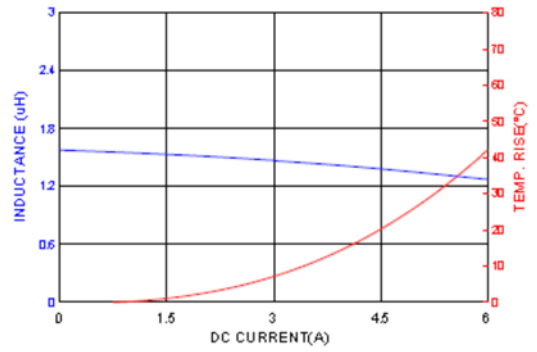
- 1.Test frequency : Ls : 100KHz /1.0V.
- 2.All test data referenced to 25°C ambient.
- 3.Testing Instrument(or equ) : L: HP4284A,CH11025,CH3302,CH1320,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER.
- 4.Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT of 40°C
- 5.Saturation Current (Isat) will cause LO to drop approximately 20%.
- 6.The part temperature (ambient + temp rise) should not exceed 125°C under worst case operating conditions.Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
- 7.Special inquiries besides the above common used types can be met on your requirement.

TYPICALELECTRICALCHARACTERISTICS:
HMPL0512HP-R10

HMPL0512HP-R15

HMPL0512HP-R22

HMPL0512HP-R33

HMPL0512HP-R36

HMPL0512HP-R47

HMPL0512HP-R68

HMPL0512HP-1R0


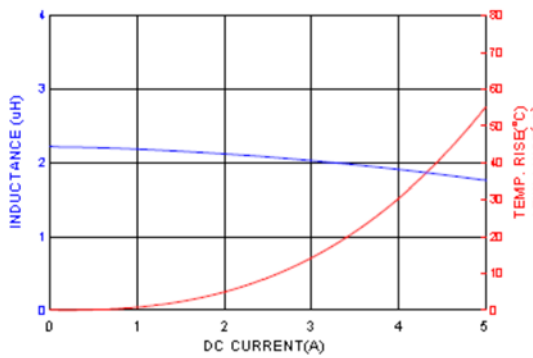
HMPL0512HP-1R2



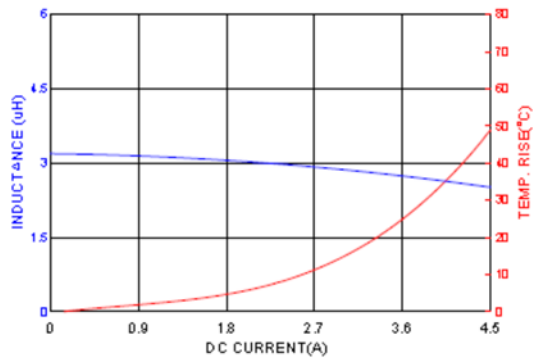
HMPL0512HP-1R5



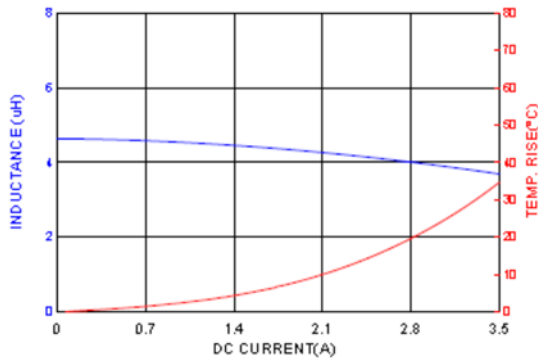
HMPL0512HP-2R2



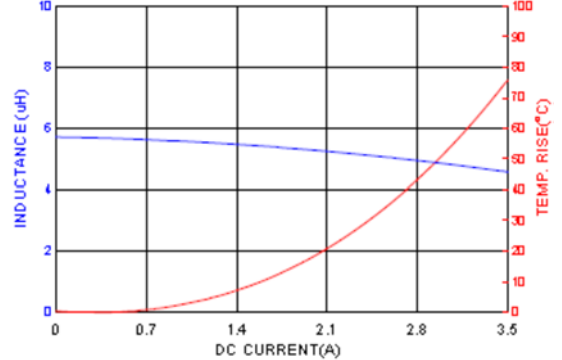
HMPL0512HP-3R3



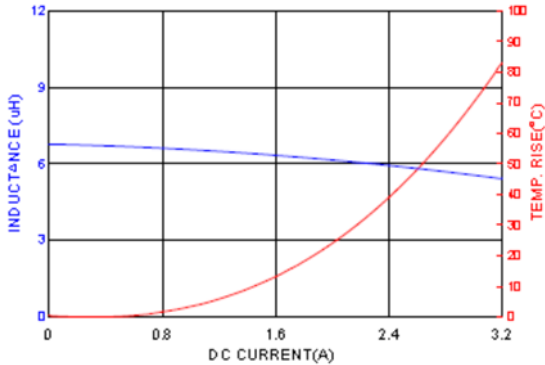
HMPL0512HP-4R7



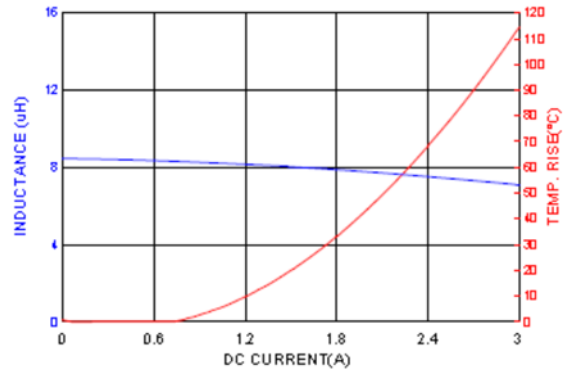
HMPL0512HP-5R6

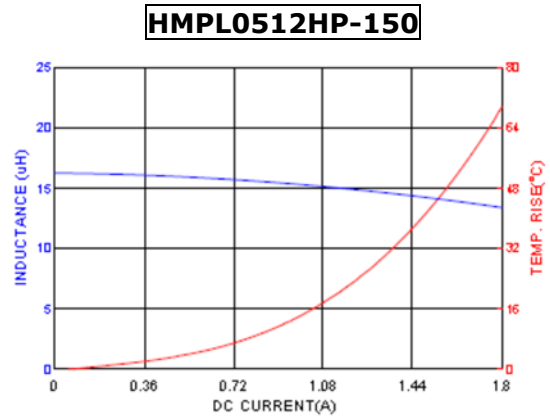
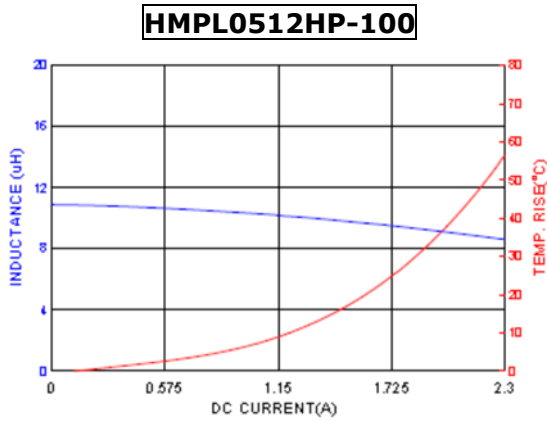


HMPL0512HP-6R8



HMPL0512HP-8R2





Reliability and Test Condition

| Item | Performance | Test Condition |
|------------------------------------|--|--|
| Operating temperature | -40~+125°C (Including self - temperature rise) | |
| Storage temperature | 1. -10~+40°C ,50~60%RH (Product with taping) 2. -40~+125°C (on board) | |
| Electrical Performance Test | | |
| Inductance | Refer to standard electrical characteristics list. | HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter. |
| DCR | | CH16502,Agilent33420A Micro-Ohm Meter. |
| Saturation Current (Isat) | Approximately Δ L30% | Saturation DC Current (Isat) will cause L0 to drop Δ L(%) |
| Heat Rated Current (Irms) | Approximately Δ T40°C | Heat Rated Current (Irms) will cause the coil temperature rise Δ T(°C). 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer |
| Reliability Test | | |
| Life Test | Appearance : No damage. Inductance : within \pm 10% of initial value Q : Shall not exceed the specification value. RDC : within \pm 15% of initial value and shall not exceed the specification value | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles) Temperature : 125 \pm 2°C (Inductor) Applied current : rated current Duration : 1000 \pm 12hrs Measured at room temperature after placing for 24 \pm 2 hrs |
| Load Humidity | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles) Humidity : 85 \pm 2 % R.H, Temperature : 85°C \pm 2°C Duration : 1000hrs Min. with 100% rated current Measured at room temperature after placing for 24 \pm 2 hrs |
| Moisture Resistance | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles 1. Baked at50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65 \pm 2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3. Raise temperature to 65 \pm 2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs,keep at 25°C for 2 hrs then keep at -10°C for 3 hrs 4. Keep at 25°C 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. |

| Thermal shock | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles Condition for 1 cycle Step1 : -40±2°C 30±5min Step2 : 25±2°C ≤0.5min Step3 : 125±2°C 30±5min Number of cycles : 500 Measured at room temperature after placing for 24±2 hrs | | | | | | | | | | | | | | | |
|------------------------------|--|---|-----------------------|----------------------------|--|-----------------------|----------------------------|-------|----------------|----|-----------|------|------|----|----|-----------|------|
| Vibration | | 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). | | | | | | | | | | | | | | | |
| Bending | | 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. | | | | | | | | | | | | | | | |
| Shock | 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 | <table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (V)/ft/sec</th> </tr> </thead> <tbody> <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> </tbody> </table> | Type | Peak value (g's) | Normal duration (D) (ms) | Wave form | Velocity change (V)/ft/sec | SMD | 50 | 11 | Half-sine | 11.3 | Lead | 50 | 11 | Half-sine | 11.3 |
| Type | Peak value (g's) | Normal duration (D) (ms) | Wave form | Velocity change (V)/ft/sec | | | | | | | | | | | | | |
| SMD | 50 | 11 | Half-sine | 11.3 | | | | | | | | | | | | | |
| Lead | 50 | 11 | Half-sine | 11.3 | | | | | | | | | | | | | |
| Solder ability | More than 95% of the terminal electrode should be covered with solder. | Preheat: 150°C,60sec. Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245±5°C Flux for lead free: Rosin. 9.5% Dip time: 4±1sec Depth: completely cover the termination Depth: completely cover the termination | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | | <table border="1"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table> | Temperature(°C) | Time(s) | Temperature ramp/immersion and emersion rate | Number of heat cycles | 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s | 1 | | | | | | | |
| Temperature(°C) | Time(s) | Temperature ramp/immersion and emersion rate | Number of heat cycles | | | | | | | | | | | | | | |
| 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s | 1 | | | | | | | | | | | | | | |
| Terminal Strength | 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 | 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. | | | | | | | | | | | | | | | |

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