

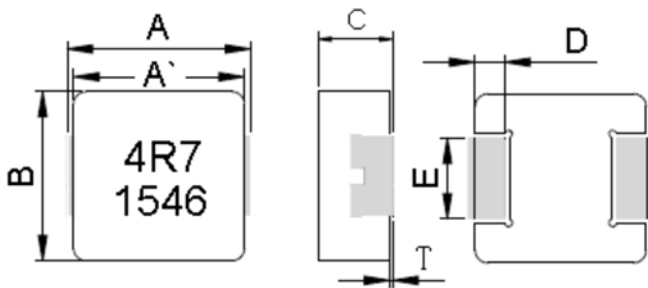
FEATRLRES

- Shielded construction.
- Capable of corresponding high frequency (5MHz).
- Low loss realized with low DCR.
- High performance (Isat) realized by metal dust core.
- Ultra low buzz noise, due to composite construction.
- 100% Lead(Pb)-Free and RoHS compliant.

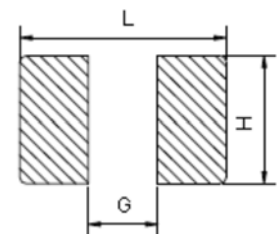
APPLICATIONS

- DC/DC converters in distributed power systems.
- DC/DC converter for Field Programmable Gate Array(FPGA).
- Battery powered devices.
- Thin type on-board power supply module for exchanger.
- VRM for server.
- High current, low profile POL converters.
- PDA/notebook/desktop/server and battery powered devices.

CONFIGLRATIONS & DIMENSIONS (unit in mm)



Recommended Land pattern



| Type | A | A' | B | C | D | E | T | L | G | H |
|-----------|---------|---------|---------|---------|-------|-------|--------|-----|-----|-----|
| HMPL0503S | 5.7±0.3 | 5.2±0.3 | 5.2±0.2 | 2.8±0.2 | 1±0.3 | 2±0.2 | 0~0.15 | 6.5 | 2.5 | 1.8 |

Note:

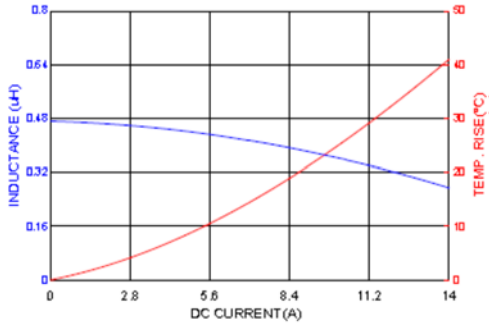
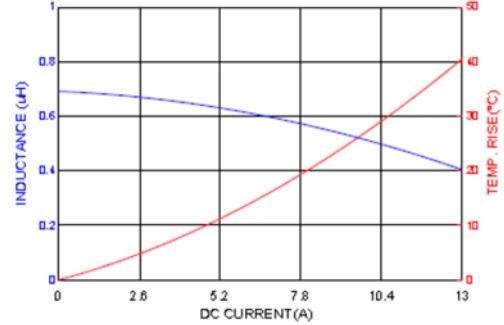
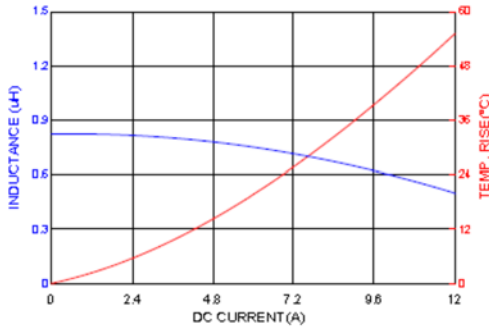
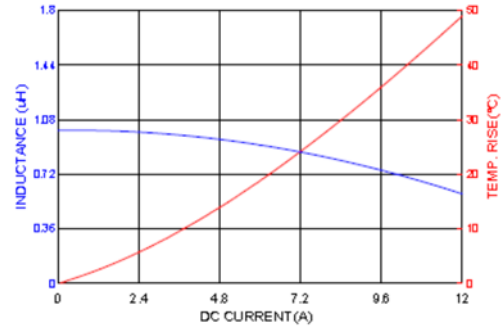
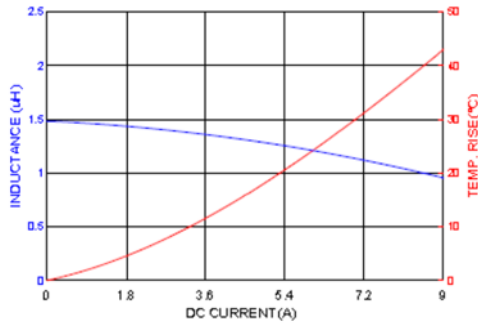
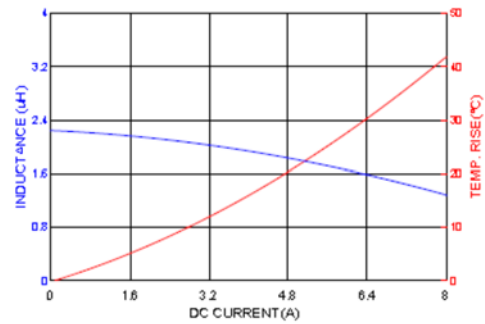
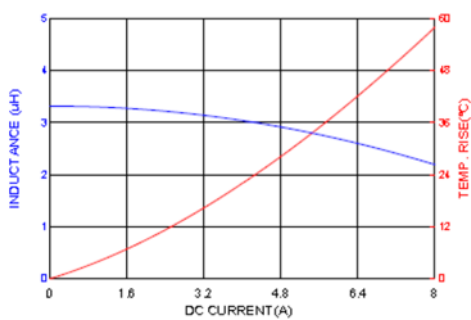
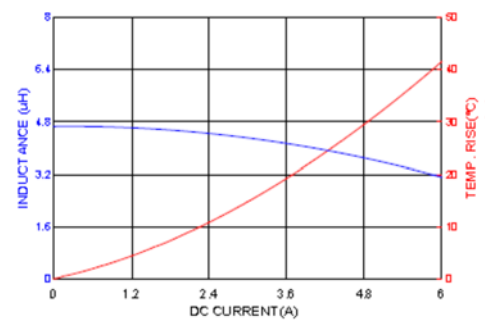
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.12mm and above.

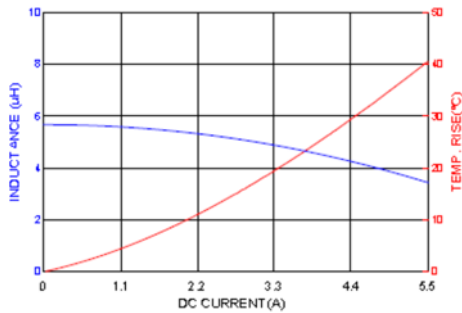
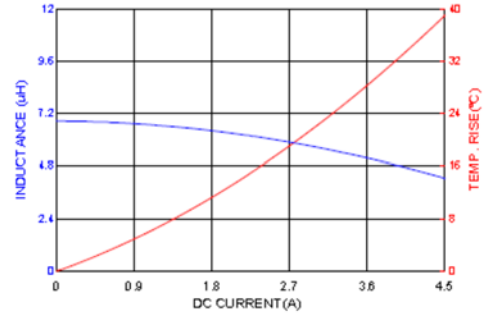
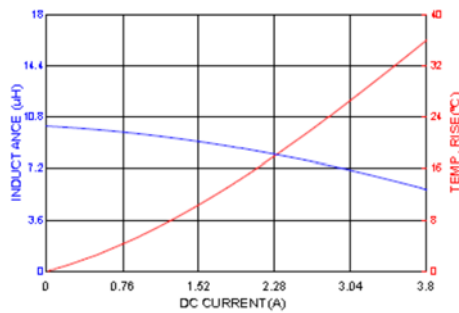
ELECTRICAL CHARACTERISTICS

| Part Number | Inductance LO A(uH) $\pm 20\%$ | Heat Rating Current | | Saturation Current | | DCR | |
|-------------------|-----------------------------------|---------------------|-----|--------------------|-----|---------------|------|
| | | DC Typ (A) Irms. | | DC Typ (A)I sat | | (m Ω) | |
| | | Typ | Max | Typ | Max | Typ | Max |
| HMPL0503S-R47MN-D | 0.47 | 13.5 | 12 | 10 | 9.0 | 5.2 | 6.0 |
| HMPL0503S-R68MN-D | 0.68 | 12.5 | 11 | 9.0 | 8.0 | 7.4 | 8.5 |
| HMPL0503S-R82MN-D | 0.82 | 10 | 9.0 | 8.8 | 7.7 | 8.0 | 9.2 |
| HMPL0503S-1R0MN-D | 1.00 | 9.0 | 8.0 | 8.5 | 7.5 | 10.5 | 12 |
| HMPL0503S-1R5MN-D | 1.50 | 8.0 | 7.0 | 7.5 | 6.5 | 13.6 | 15.7 |
| HMPL0503S-2R2MN-D | 2.20 | 7.0 | 6.5 | 6.5 | 5.8 | 21.6 | 25 |
| HMPL0503S-3R3MN-D | 3.30 | 6.3 | 5.8 | 6.0 | 5.3 | 28 | 33 |
| HMPL0503S-4R7MN-D | 4.70 | 5.5 | 4.8 | 5.3 | 4.6 | 38 | 44 |
| HMPL0503S-5R6MN-D | 5.60 | 5.0 | 4.3 | 4.6 | 4.0 | 50 | 58 |
| HMPL0503S-6R8MN-D | 6.80 | 4.3 | 3.7 | 3.5 | 3.1 | 57 | 66 |
| HMPL0503S-100MN-D | 10.0 | 3.8 | 3.4 | 2.5 | 2.1 | 88 | 103 |

Note:

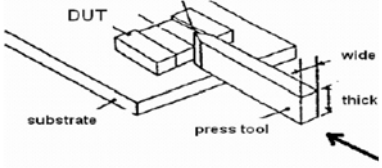
1. Test frequency : Ls : 100KHz /1.0V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument(or equ) : L: HP4284A,CH11025,CH3302,CH1320,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER.
4. Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT of 40°C
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:
HMPL0503S-R47

HMPL0503S-R68

HMPL0503S-R82

HMPL0503S-1R0

HMPL0503S-1R5

HMPL0503S-2R2

HMPL0503S-3R3

HMPL0503S-4R7


HMPL0503S-5R6

HMPL0503S-6R8

HMPL0503S-100


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. | 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 | 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) 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 at 50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65±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±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 (Vi)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 (Vi)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 (Vi)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 | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | | Depth: completely cover the termination <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.