

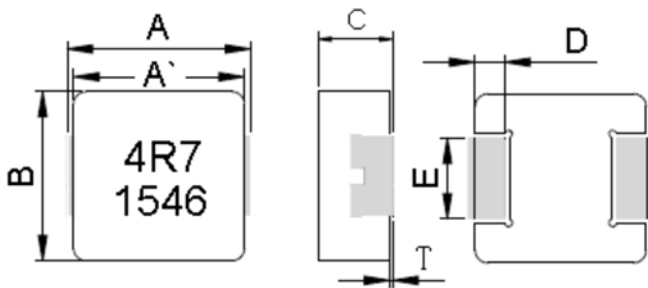
FEATRLRES

- 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.

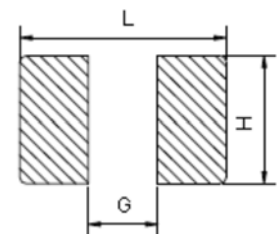
APPLICATIONS

- 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
HMPL2313	23.5±0.5	22.7±0.3	5.22±0.3	12.6±0.4	5±0.4	19±0.3

L	G	H
24	12.5	19.6

Note:

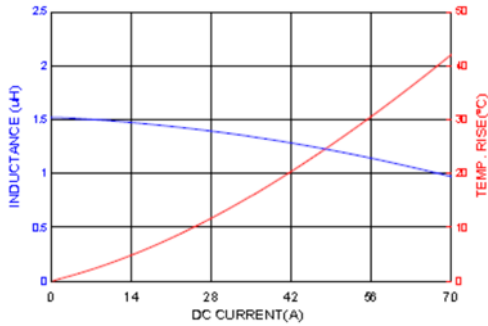
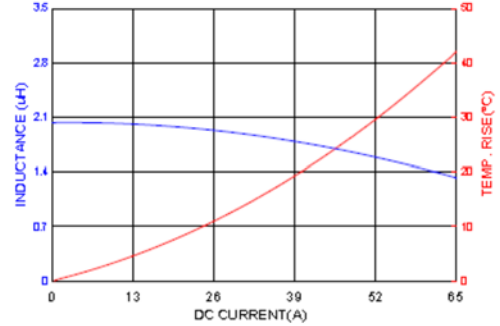
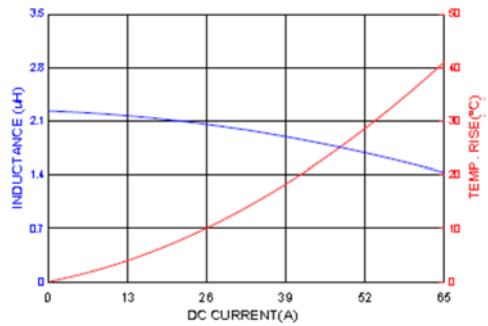
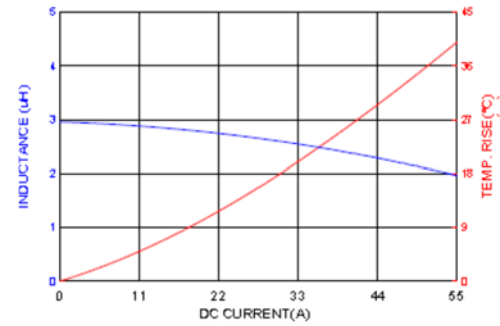
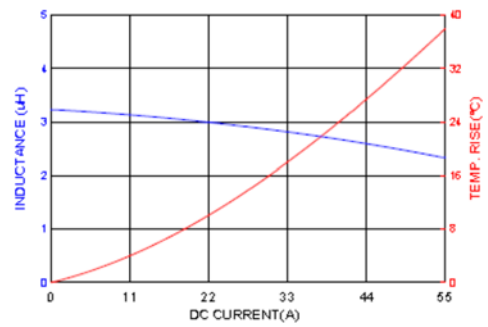
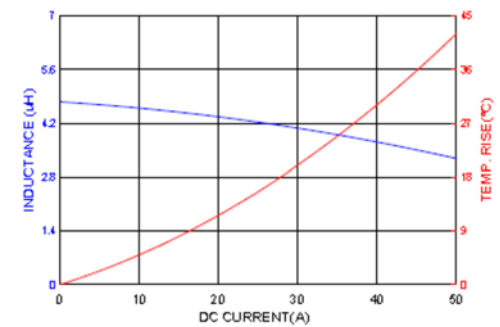
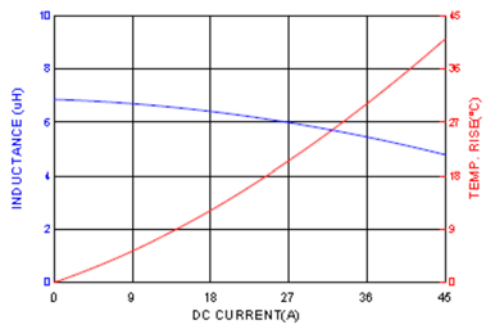
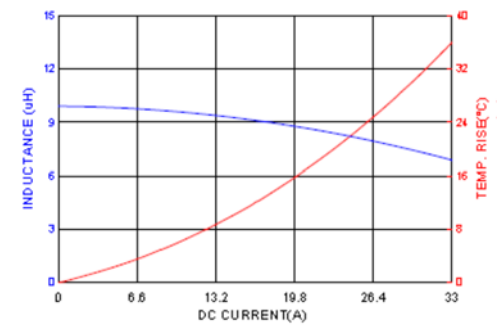
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.12mm and above.

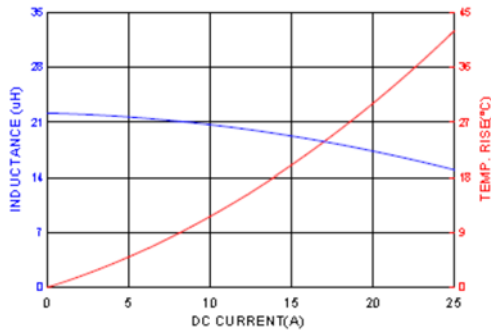
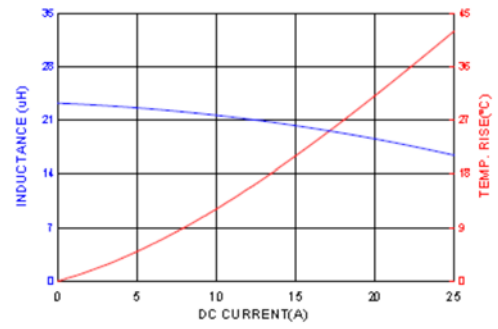
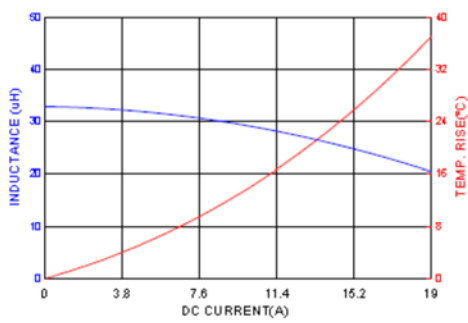
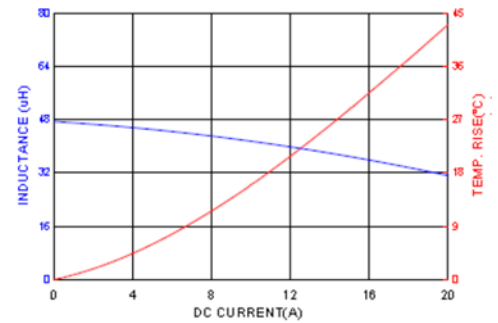
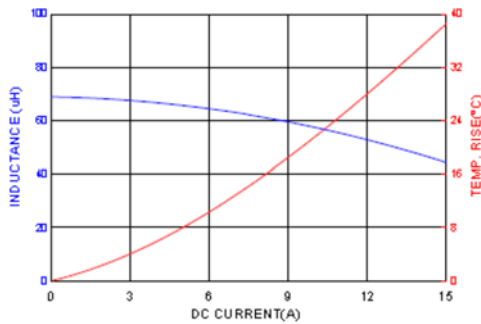
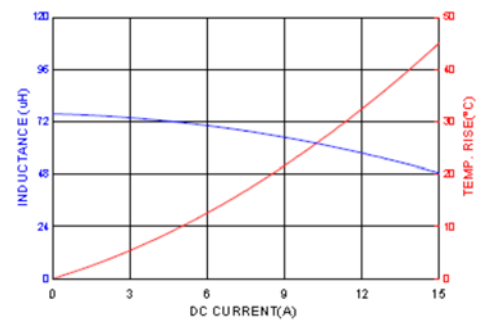
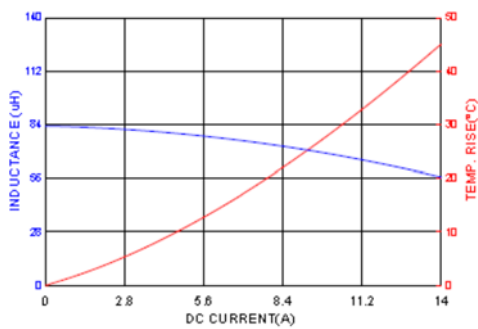
ELECTRICAL CHARACTERISTICS

Part Number	Inductance L0 A(uH) ±20%	Heat Rating Current		Saturation Current		DCR	
		DC Typ (A) Irms.		DC Typ (A)I sat		(mΩ)	
		Typ	Max	Typ	Max	Typ	Max
HMPL2313SP-1R5MN-D	1.50	62	57	52	48	1.0	1.15
HMPL2313SP-2ROMN-D	2.00	60	54	50	45	1.02	1.20
HMPL2313SP-2R2MN-D	2.20	58	52	48	43	1.05	1.25
HMPL2313SP-3ROMN-D	3.00	51	48	44	39	1.42	1.64
HMPL2313SP-3R3MN-D	3.30	49	47	41	37	1.5	1.75
HMPL2313SP-4R7MN-D	4.70	47	44	38	34	1.9	2.2
HMPL2313SP-6R8MN-D	6.80	40	36	36	32	2.7	3.1
HMPL2313SP-100MN-D	10.0	33	30	28	20	3.8	4.15
HMPL2313SP-220MN-D	22.0	22	18	15	14	9.2	11
HMPL2313SP-230MN-D	23.0	22	18	15	14	9.2	11
HMPL2313SP-330MN-D	33.0	19	16	12	10.5	13.5	15.4
HMPL2313SP-470MN-D	47.0	17	14	12	10	17.3	20.8
HMPL2313SP-680MN-D	68.0	14	12	12	9.0	26.2	29.5
HMPL2313SP-750MN-D	75.0	13	11	10.5	8.5	27.5	31.6
HMPL2313SP-820MN-D	82.0	12	10	9.0	7.7	31	34.2
HMPL2313SP-101MN-D	100	11	9.5	9.0	7.5	36	40

Note:

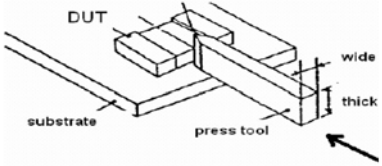
1. Test frequency : Ls : 100KHz /1.0V.
2. All test data referenced to 25°C ambient.
3. Testing Instrument(or equ) : L: HP4284A,CH11025,CH3302,CH1320,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER.
4. Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT of 40°C
5. Saturation Current (Isat) will cause L0 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:
HMPL2313SP-1R5

HMPL2313SP-2R0

HMPL2313SP-2R2

HMPL2313SP-3R0

HMPL2313SP-3R3

HMPL2313SP-4R7

HMPL2313SP-6R8

HMPL2313SP-100


HMPL2313SP-220

HMPL2313SP-330

HMPL2313SP-470

HMPL2313SP-680

HMPL2313SP-750

HMPL2313SP-820

HMPL2313SP-101


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 $\Delta L30\%$	Saturation DC Current (Isat) will cause L0 to drop $\Delta L(\%)$															
Heat Rated Current (Irms)	Approximately $\Delta T40^\circ\text{C}$	Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T(^\circ\text{C})$. 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-020D Classification Reflow Profiles) Temperature : $125\pm 2^\circ\text{C}$ (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-020D Classification Reflow Profiles) Humidity : $85\pm 2 \times \text{R.H.}$, Temperature : $85^\circ\text{C} \pm 2^\circ\text{C}$ 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-020D Classification Reflow Profiles) 1. Baked at 50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to $65\pm 2^\circ\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3. Raise temperature to $65\pm 2^\circ\text{C}$ 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-020D Classification Reflow Profiles) Condition for 1 cycle Step1 : $-40\pm 2^\circ\text{C}$ 30 \pm 5min Step2 : $25\pm 2^\circ\text{C}$ ≤ 0.5 min Step3 : $125\pm 2^\circ\text{C}$ 30 \pm 5min Number of cycles : 500 Measured at room temperature after placing for 24 \pm 2 hrs															
Vibration		Oscillation Frequency: 10 ~ 2K ~ 10Hz for 20 minutes Equipment : Vibration checker Total Amplitude: $1.52\text{mm} \pm 10\%$ Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations).															
Bending		Shall be mounted on a FR4 substrate of the following dimensions: ≥ 0.805 inch(2012mm):40x100x1.2mm < 0.805 inch(2012mm):40x100x0.8mm Bending depth: ≥ 0.805 inch(2012mm):1.2mm < 0.805 inch(2012mm):0.8mm duration of 10 sec.															
Shock		Appearance : No damage. Impedance : within $\pm 15\%$ of initial value 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															
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: $245\pm 5^\circ\text{C}$ <table border="1" data-bbox="1018 1854 1455 1989"> <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
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		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
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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(>0.805:1kg , <=0.805:0.5kg)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.