

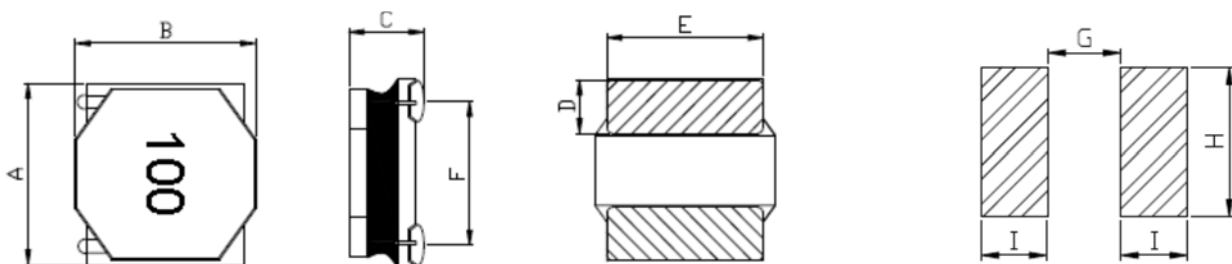
FEATRLRES

- Magnetic-resin shielded construction reduces buzz noise to ultra-low levels
- Metallization on ferrite core results in excellent shock resistance and damage-free durability
- Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
- 30% higher current rating than conventional nductors of equal size
- Takes up less PCB real estate and save more power

APPLICATIONS

- LED Lighting
- Next-generation mobile devices with multifunction such as mobile TV and digital movie cameras
- Flat-screen TVs, blue-ray disc recorders, set top box
- Notebooks, desktop computers, servers, graphic cards cards
- Portable gaming devices, personal navigation systems, personal multimedia devices
- Automotive systems
- Telecomm base stations

CONFIGLRATIONS & DIMENSIONS (unit in mm)



Type	L (uH)	A	B	C	D	E	F	G	H	I
HNR5040NF	≤10 uH	4.95±0.2	4.95±0.2	3.9±0.2	1.3±0.3	4.2±0.2	3.7ref	2.1	4.2	1.5
	>10 uH			3.8±0.2						

Note:

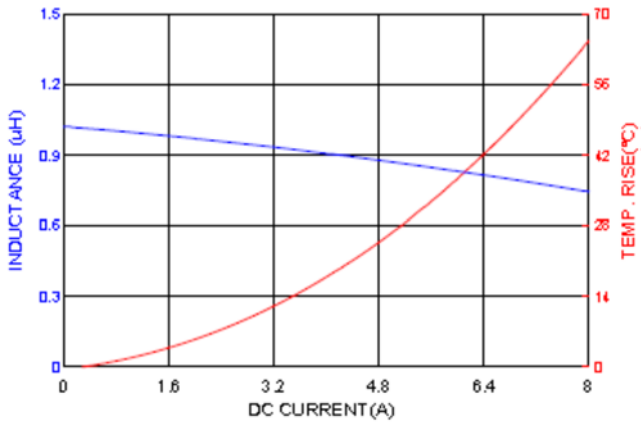
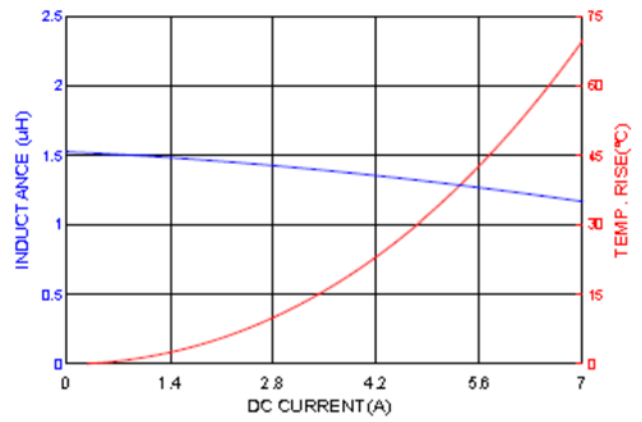
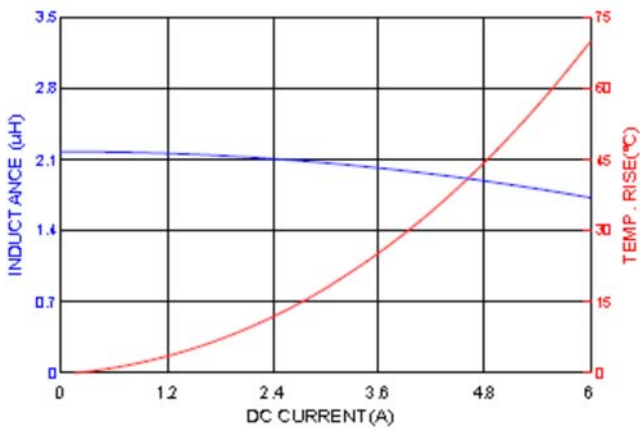
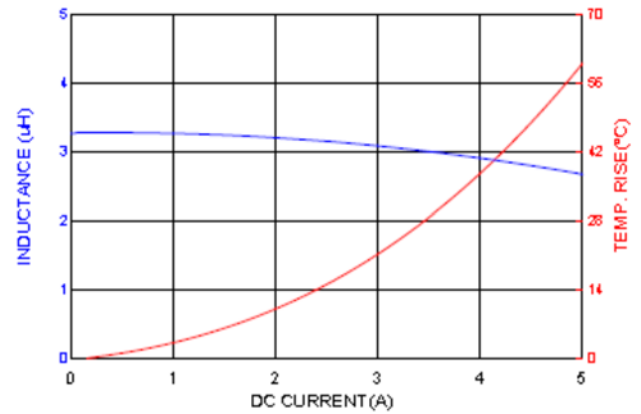
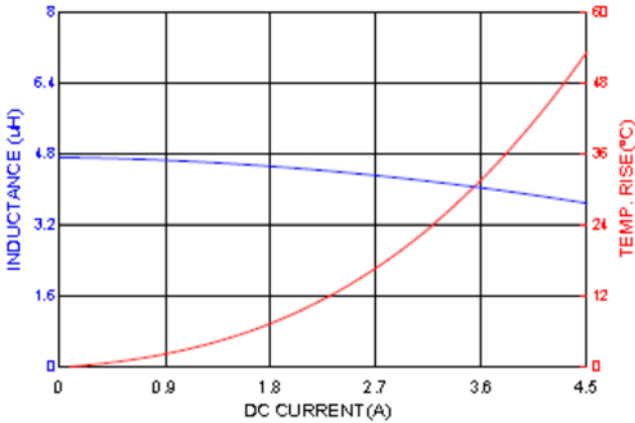
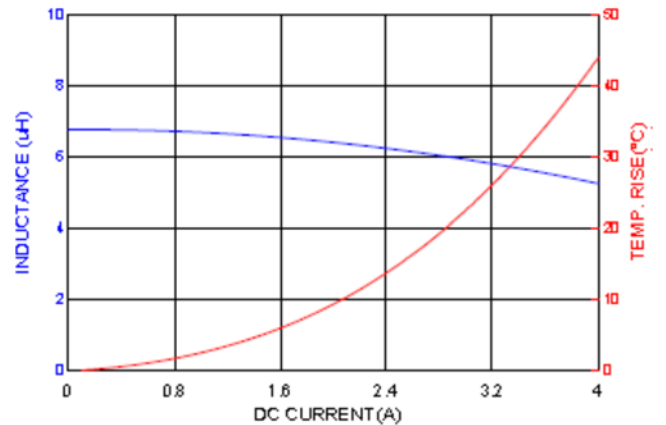
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.12mm and above.

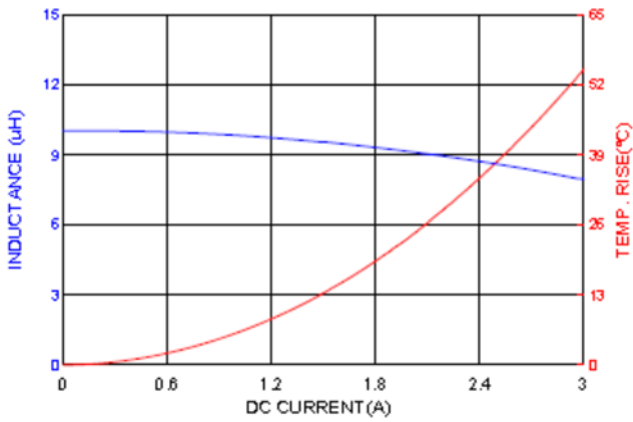
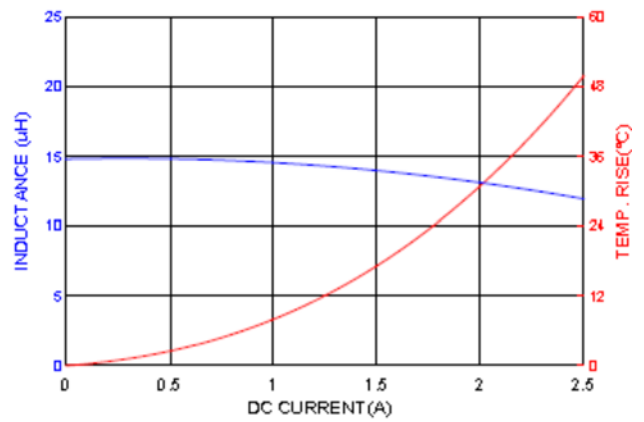
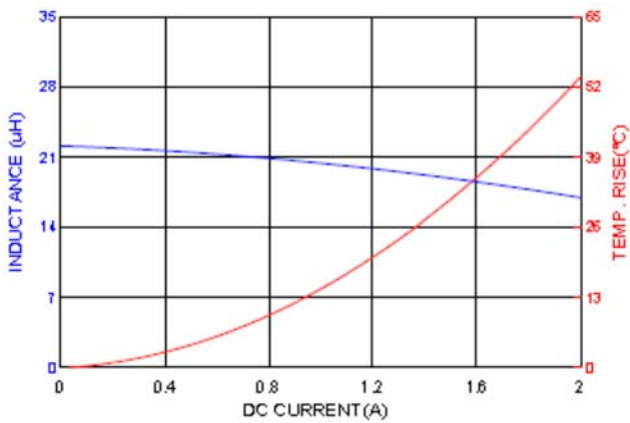
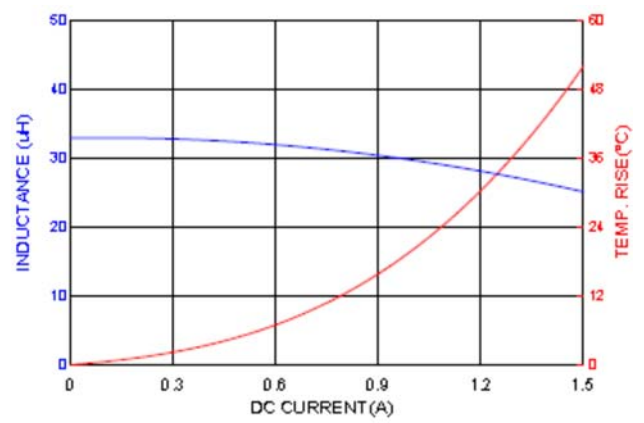
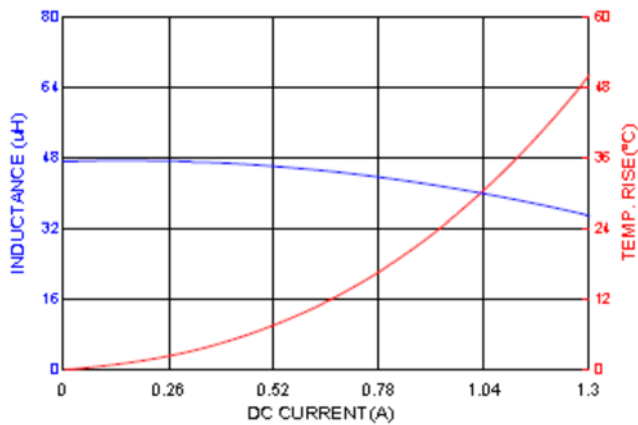
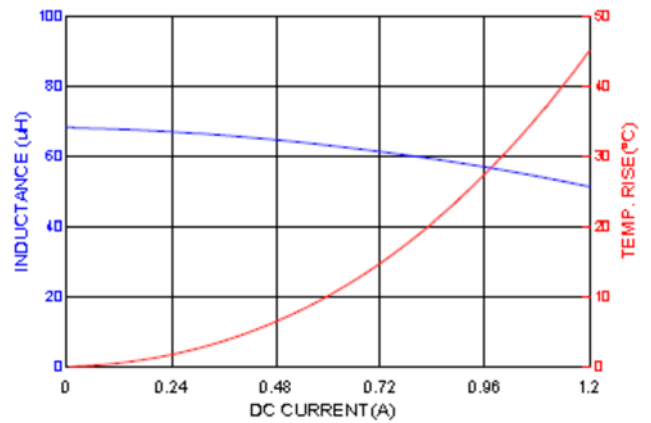
ELECTRICAL CHARACTERISTICS

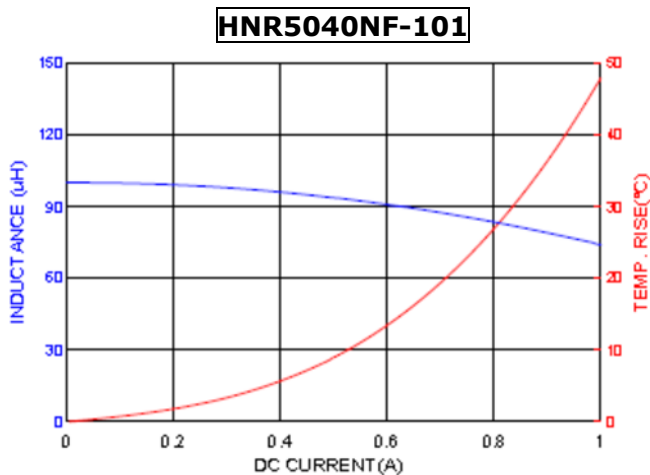
Part Number	Inductance L0 (uH) @ 0 A	Tolerance				Rated current		DCR (mΩ) @25°C ±20%.
		K	L	M	Y	Temperature current I rms (A)	Saturation current I sat (A)	
HNR5040NF-1R0	1.00	/	/	±20%	±30%	5.00	7.50	12
HNR5040NF-1R5	1.50	/	/	±20%	±30%	4.50	6.50	15
HNR5040NF-2R2	2.20	/	/	±20%	±30%	3.80	5.70	21
HNR5040NF-3R3	3.30	/	/	±20%	±30%	3.50	4.40	24
HNR5040NF-4R7	4.70	/	/	±20%	±30%	3.20	3.90	32
HNR5040NF-6R8	6.80	/	/	±20%	±30%	2.50	3.30	43
HNR5040NF-100	10.0	/	/	±20%	±30%	2.20	2.52	56
HNR5040NF-150	15.0	/	±15%	±20%	±30%	1.80	2.00	80
HNR5040NF-220	22.0	/	±15%	±20%	±30%	1.50	1.62	123
HNR5040NF-330	33.0	/	±15%	±20%	±30%	1.20	1.30	180
HNR5040NF-470	47.0	±10%	±15%	±20%	±30%	1.00	1.10	270
HNR5040NF-680	68.0	±10%	±15%	±20%	±30%	0.80	0.90	400
HNR5040NF-101	100	±10%	±15%	±20%	±30%	0.72	0.75	560

Note:

- All test data referenced to 25°C ambient , Ls:100KHz/1V.
- Testing Instrument : HP4284A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH502BC MICRO OHMMETER.
- Heat Rated Current (Irms) will cause the coil temperature rise approximately Δt of 40°C.
- Saturation Current (Isat) will cause L0 to drop approximately 30%.
- 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.
- Special inquiries besides the above common used types can be met on your requirement.

TYPICALELECTRICALCHARACTERISTICS:
HNR5040NF-1R0

HNR5040NF-1R5

HNR5040NF-2R2

HNR5040NF-3R3

HNR5040NF-4R7

HNR5040NF-6R8


HNR5040NF-100

HNR5040NF-150

HNR5040NF-220

HNR5040NF-330

HNR5040NF-470

HNR5040NF-680




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 ΔL 30%	Saturation DC Current (Isat) will cause L0 to drop ΔL (%)
Heat Rated Current (Irms)	Approximately ΔT 40°C	Heat Rated Current (Irms) will cause the coil temperature rise ΔT (°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 ± 2 °C (Inductor) Applied current : rated current Duration : 1000 ± 12 hrs Measured at room temperature after placing for 24 ± 2 hrs
Load Humidity		Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles) Humidity : 85 ± 2 * R.H. Temperature : 85° ± 2 °C Duration : 1000hrs Min. with 100% rated current Measured at room temperature after placing for 24 ± 2 hrs
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles) 1. Baked at 50° ± 2 °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° ± 2 °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° ± 2 °C in 2.5hrs, keep at 25° ± 2 °C for 2 hrs then keep at -10° ± 2 °C for 3 hrs 4. Keep at 25° ± 2 °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
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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							
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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.