

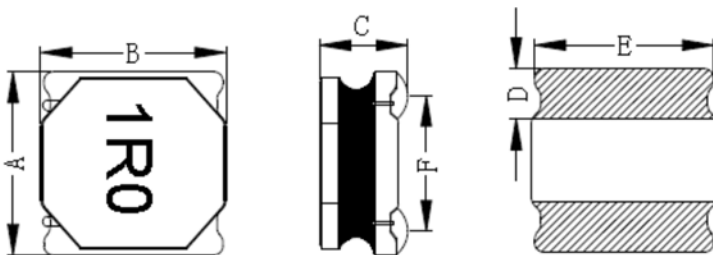
FEATRLRES

- 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

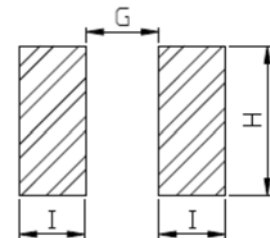
APPLICATIONS

- 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)



Recommended Land pattern



Type	A	B	C	D	E	F
HNR5020NF	5.0±0.2	5.0±0.2	1.8±0.2	1.3±0.2	4.7±0.2	3.7ref

G	H	I
2.1	4.7	1.5

*Dimensions are not including the termination. For maximum overall dimensions with termination , add 0.1mm

Note:

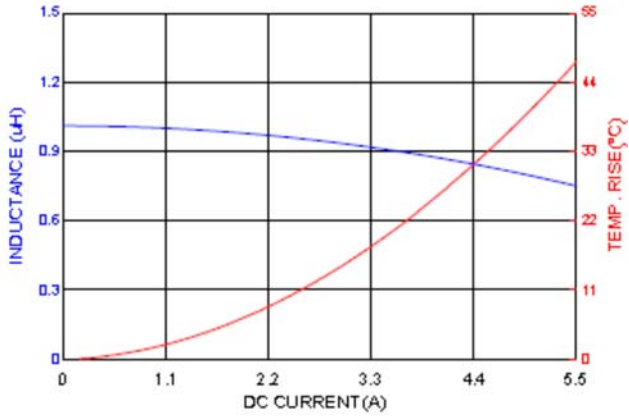
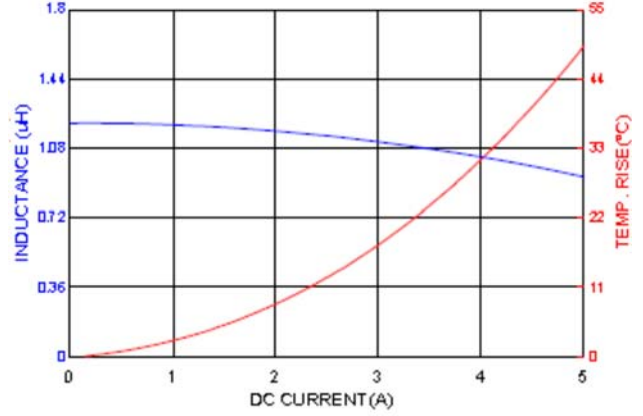
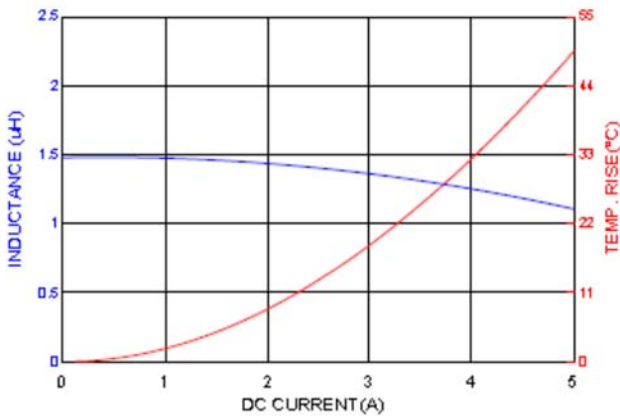
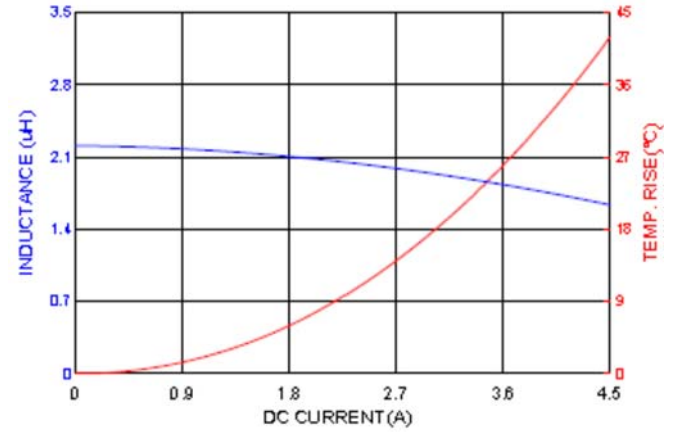
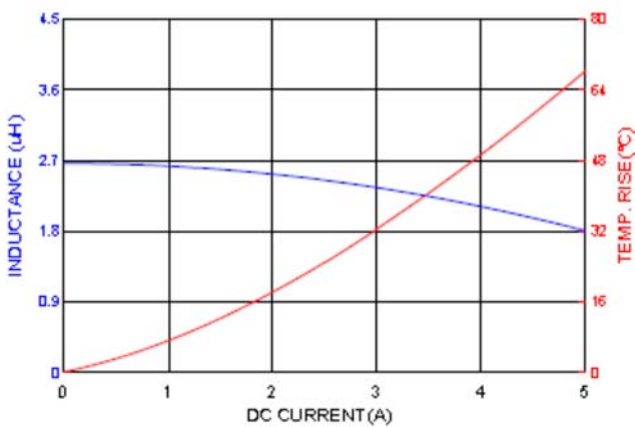
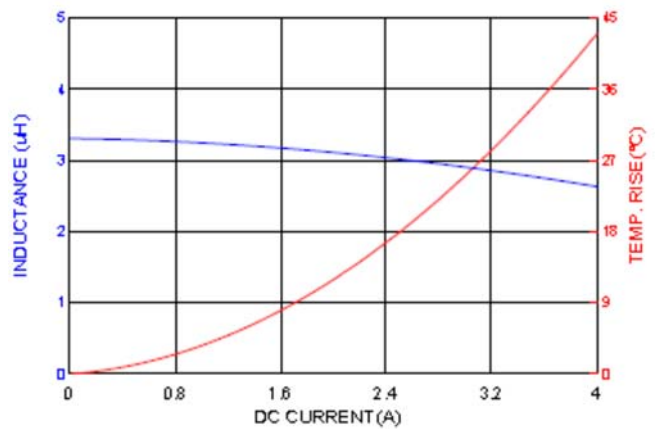
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.12mm and above.

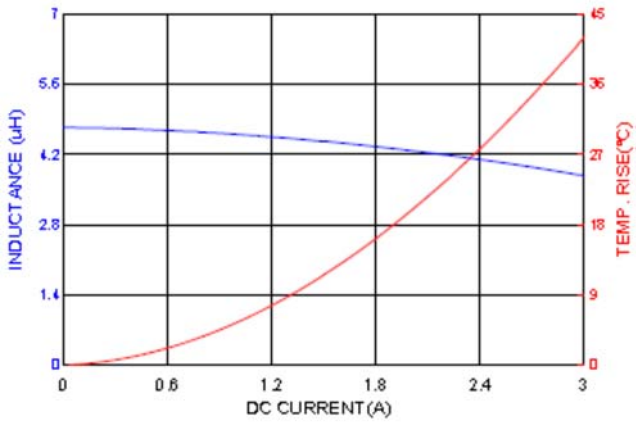
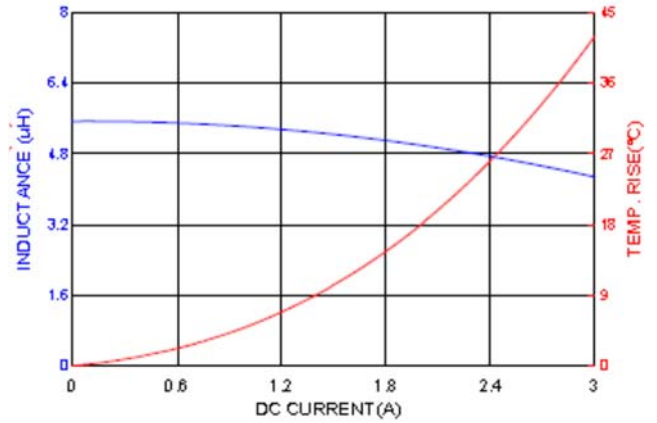
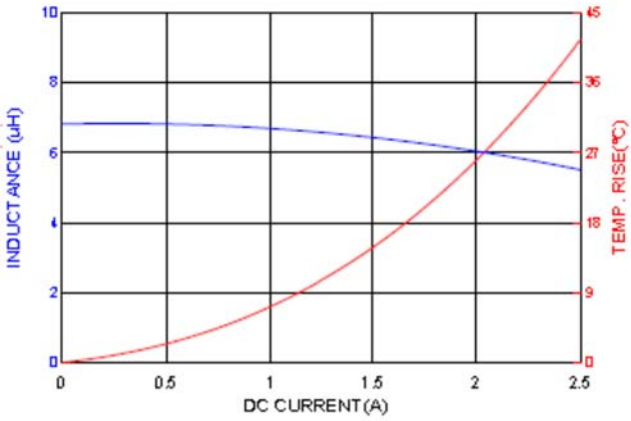
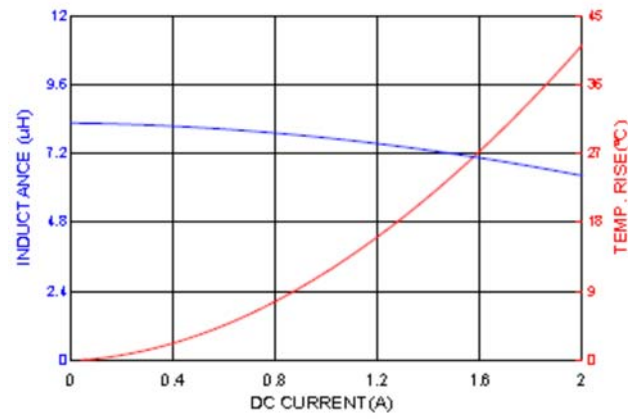
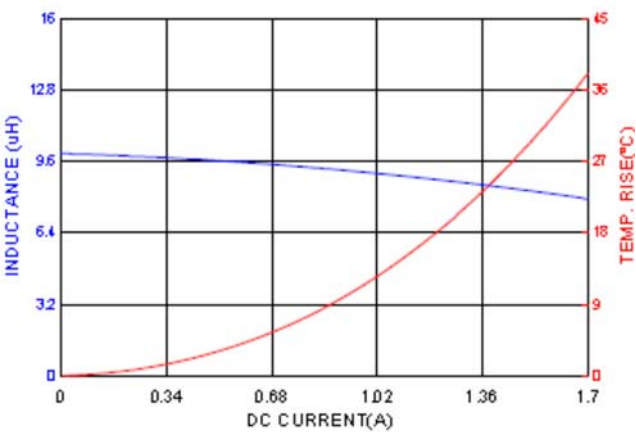
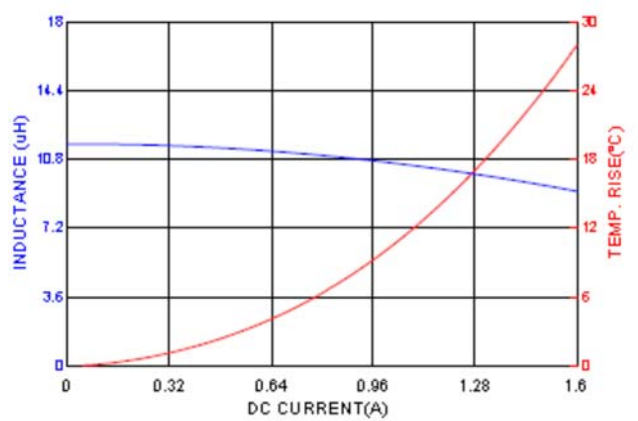
ELECTRICAL CHARACTERISTICS

Part Number	Inductance		Rated current		DCR (mΩ) @25°C ±20%.
	L0 (uH)±20%	Tolerance	Temperature current	Saturation current	
	@ 0 A		I rms (A)	I sat (A)	
HNR5020NF-1R0Y	1.00	±30%	4.10	5.00	20
HNR5020NF-1R2Y	1.20	±30%	3.80	4.80	20
HNR5020NF-1R5Y	1.50	±30%	3.50	4.50	25
HNR5020NF-2R2M	2.20	±20%	3.30	4.10	32
HNR5020NF-2R7M	2.70	±20%	3.00	3.80	38
HNR5020NF-3R3M	3.30	±20%	2.80	3.50	43
HNR5020NF-4R7M	4.70	±20%	2.40	2.70	60
HNR5020NF-5R6M	5.60	±20%	2.10	2.40	69
HNR5020NF-6R8M	6.80	±20%	1.90	2.10	90
HNR5020NF-8R2M	8.20	±20%	1.75	1.90	98
HNR5020NF-100M	10.0	±20%	1.60	1.70	110
HNR5020NF-120M	12.0	±20%	1.40	1.40	135
HNR5020NF-150M	15.0	±20%	1.25	1.30	165
HNR5020NF-180M	18.0	±20%	1.17	1.20	190
HNR5020NF-220M	22.0	±20%	1.10	1.10	225
HNR5020NF-330M	33.0	±20%	0.80	0.80	335
HNR5020NF-470M	47.0	±20%	0.70	0.70	460

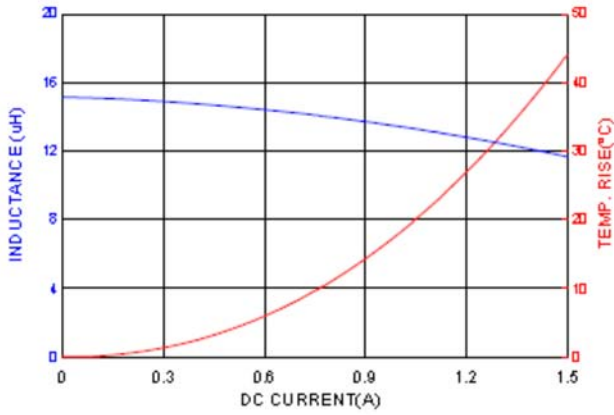
Note:

- 1.All test data referenced to 25°C ambient , Ls:100KHz/1V.
- 2.Testing Instrument : HP4284A,CH11025,CH3302,CH1320 ,CH1320S LCR METER / Rdc:CH502BC MICRO OHMMETER.
- 3.Heat Rated Current (Irms) will cause the coil temperature rise approximately Δt of 40°C.
- 4.Saturation Current (Isat) will cause L0 to drop approximately 30%.
- 5.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.
- 6.Special inquiries besides the above common used types can be met on your requirement.

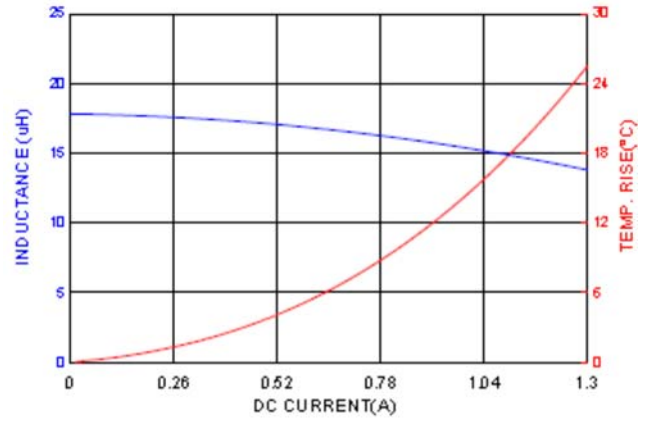
TYPICALELECTRICALCHARACTERISTICS:
HNR5020NF-1R0

HNR5020NF-1R2

HNR5020NF-1R5

HNR5020NF-2R2

HNR5020NF-2R7

HNR5020NF-3R3


HNR5020NF-4R7

HNR5020NF-5R6

HNR5020NF-6R8

HNR5020NF-8R2

HNR5020NF-100

HNR5020NF-120


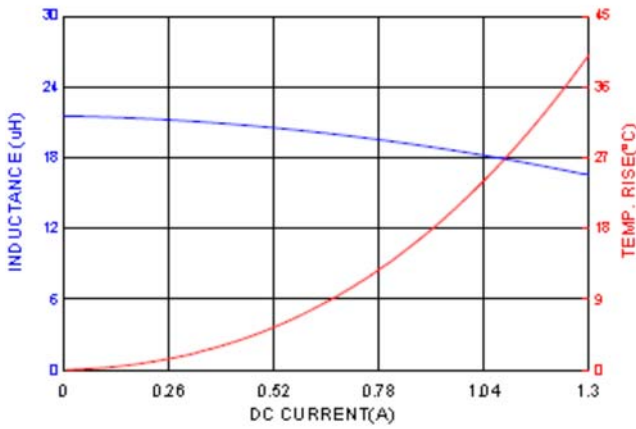
HNR5020NF-150



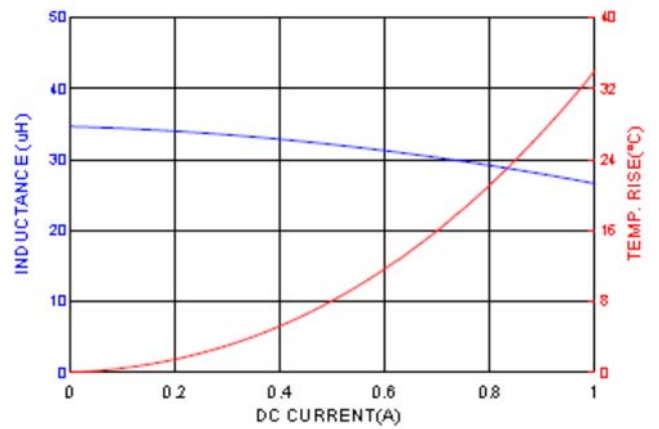
HNR5020NF-180



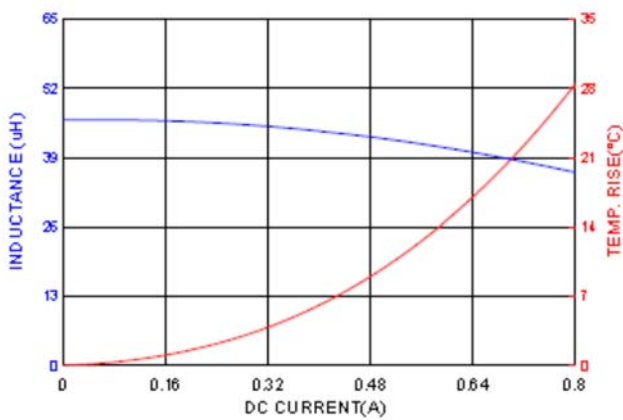
HNR5020NF-220



HNR5020NF-330



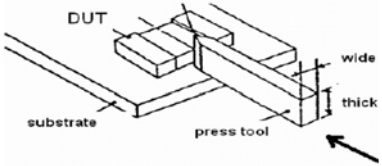
HNR5020NF-470



Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	1. -10~+40℃,50~60%RH (Product with taping) 2. -40~+125℃ (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-020DClassification Reflow Profiles) Temperature : 125 $\pm 2^{\circ}\text{C}$ (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-020DClassification Reflow Profiles) Humidity : 85 ± 2 % R.H, Temperature : 85 $\pm 2^{\circ}\text{C}$ 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-020DClassification Reflow Profiles) 1. Baked at50 $^{\circ}\text{C}$ 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 $^{\circ}\text{C}$ 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 $^{\circ}\text{C}$ in 2.5hrs,keep at 25 $^{\circ}\text{C}$ for 2 hrs then keep at -10 $^{\circ}\text{C}$ for 3 hrs 4. Keep at 25 $^{\circ}\text{C}$ 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 $\pm 2^{\circ}\text{C}$ 30 ± 5 min Step2 : 25 $\pm 2^{\circ}\text{C}$ ≤ 0.5 min Step3 : 125 $\pm 2^{\circ}\text{C}$ 30 ± 5 min 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 $\pm 10\%$ Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations).
Bending		Shall be mounted on a FR4 substrate of the following dimensions: ≥ 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 $\pm 15\%$ 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 $^{\circ}\text{C}$,60sec. Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245 $\pm 5^{\circ}\text{C}$ ◦ Flux for lead free: Rosin. 9.5% ◦ Dip time: 4 ± 1 sec ◦

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

		Depth: completely cover the termination								
Resistance to Soldering Heat		Depth: completely cover the termination <table border="1" data-bbox="1023 277 1450 394"> <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-020Classification 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.