

Specification for Approval

Date: 2026/02/05Customer : BlumeTAI-TECH P/N: HPC4030NF-4R7M

CUSTOMER P/N: _____

DESCRIPTION: _____

QUANTITY: _____ pcs

REMARK:

Customer Approval Feedback

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SMD Power Inductor	HPC4030NF-4R7M
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ECN HISTORY LIST					
REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	26/02/05	New Issue	Hs Chen	Mr.Liang	Xu yaoyao
備 注					

SMD Power Inductor

1. Features

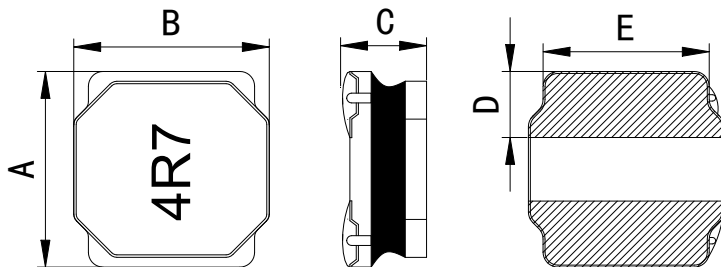
1. Magnetic-resin shielded construction reduces buzz noise to ultra-low levels
2. Metallization on ferrite core results in excellent shock resistance and damage-free durability
3. Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
4. 30% higher current rating than conventional inductors of equal size
5. Takes up less PCB real estate and save more power
6. 100% Lead(Pb)-Free & Halogen-Free and RoHS compliant.



2. Applications

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

3. Dimension

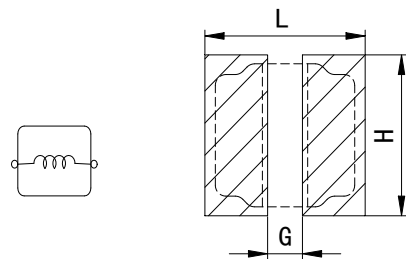


A	B	C	D	E
4.0±0.2	4.0±0.2	2.8±0.2	1.35±0.3	3.4±0.4

Unit:mm

- Note: 1. A, B Size may slightly bigger than ferrite core dimension after epoxy sealing, but not exceed 0.1mm.
 2. Component height may slight higher than C size and not exceed 0.1mm, and will be lower after reflow soldering

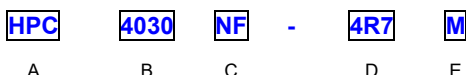
Recommend Land pattern



L	G	H
4.5	1.5	4.5

- Note : 1. PCB layout is referred to standard IPC-7351B
 2. The above PCB layout reference only.
 3. Recommend solder paste thickness at 0.15mm and above.

4. Part Numbering



A: Series

B: Dimension

C: Type

D: Inductance

E: Inductance Tolerance

A/B*C

4R7=4.70uH

K=±10%, L=±15%, M=±20%, Y=±30%.

marking direction cannot decide polarity. Color: Black, unidirectional. magnetic shielding

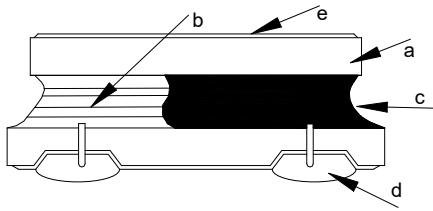
5. Specification

Part Number	Inductance (uH) ±20% @ 0 A DC	I rms (A)	I sat (A)	DCR (mΩ) ±20%
		Typ	Typ	
HPC4030NF-4R7M	4.70	2.05	2.90	60

Note:

1. All test data referenced to 25°C ambient, L_s :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. Rated DC current: The lower value of Irms and Isat.
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.

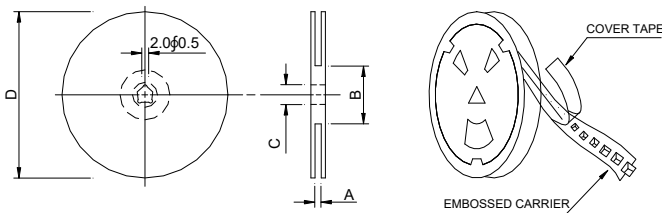
6. Material List



NO	Items	Materials
a	Core	Ferrite Core
b	Wire	Enameled Copper Wire
c	Glue	Epoxy with magnetic powder
d	Terminal	Ag/Ni/Sn+ Sn Solder
e	Ink	Halogen-free ketone

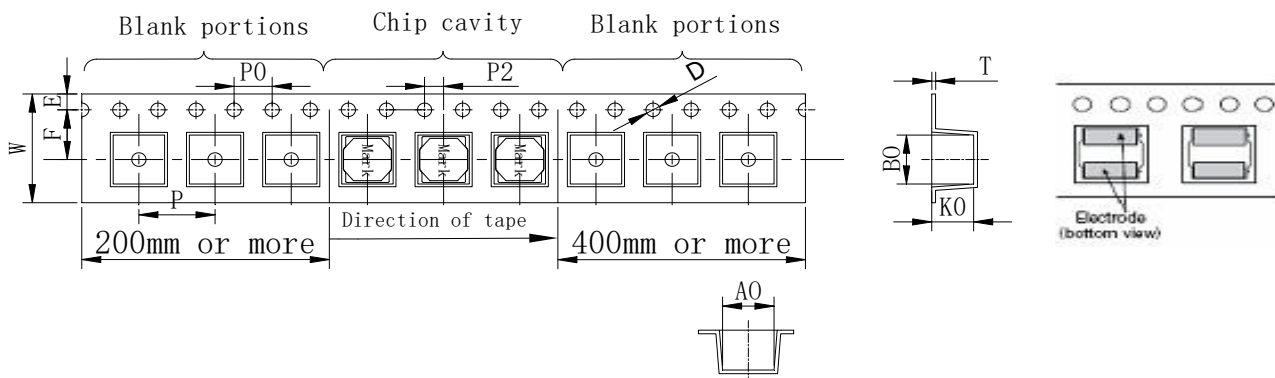
7. Packaging Information

(1) Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x12mm	12.4+2/-0	100±2.0	13+0.5/-0.2	330±3.0

(2) Tape Dimension



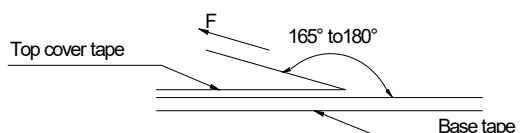
B0	A0	K0	P	W	T	E	F	D	P0	P2
4.25±0.1	4.25±0.1	3.2±0.1	8.0±0.1	12±0.3	0.35±0.1	1.75±0.1	5.5±0.1	1.5±0.1	4.0±0.1	2.00±0.1

Unit: mm

(3) Packaging Quantity

HPC	4030
Reel	2000

(4) Tearing Off Force

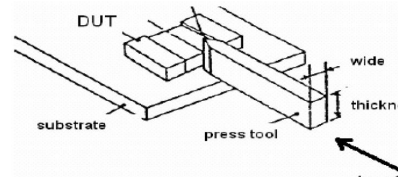


The force for tearing off cover tape is 10 to 130 grams in the arrow direction under the following conditions (referenced ANSI/EIA-481-D-2008 of 4.11 standard).

Tearing Speed mm	Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)
300±10%	5~35	45~85	860~1060

8. 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 ΔL 30%.	Saturation DC Current (Isat) will cause L0 to drop ΔL (%)
Heat Rated Current (Irms)	Approximately ΔT 40℃	Heat Rated Current (Irms) will cause the coil temperature rise ΔT (℃) without core loss. 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 reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) Temperature: 125 ± 2 ℃ (Inductor, ambient + temp rise) Applied current: rated current Duration: 1000 ± 12 hrs Measured at room temperature after placing for 24 ± 2 hrs.
Load Humidity		Preconditioning: Run through reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) Humidity: 85 ± 2 % R.H. Temperature: 85 ± 2 ℃ Duration: 1000hrs Min. Bead: with 100% rated current, Inductance: with 100% rated current Measured at room temperature after placing for 24 ± 2 hrs.
Moisture Resistance		Preconditioning: Run through reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) 1. Baked at 50℃ for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65 ± 2 ℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs. 3. Raise temperature to 65 ± 2 ℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs, keep at 25℃ for 2 hrs then keep at -10℃ for 3 hrs 4. Keep at 25℃ 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 reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) Condition for 1 cycle Step1: -40 ± 2 ℃ 30 ± 5 min Step2: 125 ± 2 ℃ $\cong 0.5$ min Step3: 125 ± 2 ℃ 30 ± 5 min Number of cycles: 500 Measured at room temperature after placing for 24 ± 2 hrs.
Vibration		Preconditioning: Run through reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minutes Equipment: Vibration checker Total Amplitude: 10g Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations).

Item	Performance	Test Condition															
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. 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><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><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></table> 3 shocks in each direction along 3 perpendicular axes(18 shocks).	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													
Solderability	More than 95% of the terminal electrode should be covered with solder.	a. Method B1, 4 hrs @155°C dry heat @245°C±5°C Test time:5 +0/-0.5 seconds. b. Method D category 3. (steam aging 8hours ± 15 min)@ 260°C±5°C Test time: 30 +0/-0.5 seconds.															
Resistance to Soldering Heat		Depth: completely cover the termination <table><tr><th>Temperature(°C)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s ±6 mm/s</td><td>1</td></tr></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. 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 reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) With the component mounted on a PCB with the device to be tested, applyaforce(>0805inch(2012mm):1kg, <=0805inch(2012mm):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.

9. Soldering Specifications

(1) Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

(2) Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020F)

(3) Iron Reflow:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.(Fig. 2)

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 355°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow

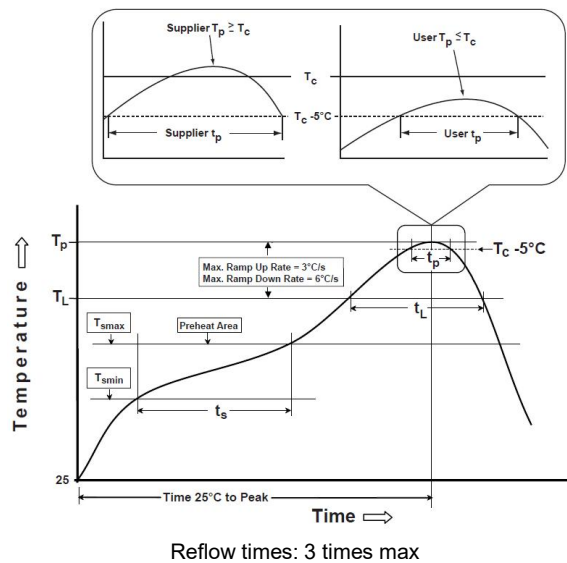


Fig.2 Iron soldering temperature profiles

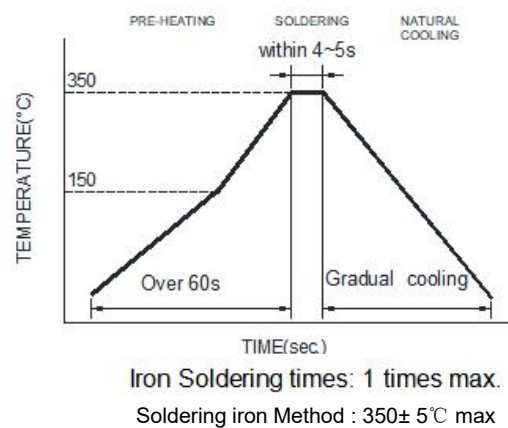


Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat	
-Temperature Min(T_{smin})	150°C
-Temperature Max(T_{smax})	200°C
-Time(t_s)from(T_{smin} to T_{smax})	60-120seconds
Ramp-up rate(T_l to T_p)	3°C/second max.
Liquidus temperature(T_l)	217°C
Time(t_l)maintained above T_l	60-150 seconds
Classification temperature(T_c)	See Table (1.2)
Time(t_p) at $T_c - 5^\circ\text{C}$ (T_p should be equal to or less than T_c .)	* < 30 seconds
Ramp-down rate(T_p to T_l)	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

T_p : maximum peak package body temperature, T_c : the classification temperature.

For user (customer) T_p should be equal to or less than T_c .

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

	Package Thickness	Volume mm ³	Volume mm ³	Volume mm ³
		<350	350-2000	>2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020F.

10. Notes

- (1) When there are questions concerning measurement result : measurement shall be made after 48±2 hours of recovery under the standard condition.
- (2) This power choke coil itself does not have any protective function in abnormal condition such as overload, short-circuit and open-circuit conditions, etc. Therefore, it shall be confirmed as the end product that there is no risk of smoking, fire, dielectric withstand voltage, insulation resistance, etc. in abnormal conditions to provide protective devices and/or protection circuit in the end product.
- (3) When this power choke coil was used in a similar or new product to the original one, sometimes it might not be able to satisfy the specifications due to different condition of use.
- (4) Dielectric withstanding test with higher voltage than specific value will damage insulating material and shorten its life.
- (5) This power choke coil must not be used in wet condition by water, coffee or any liquid because insulation strength becomes very low in this condition.
- (6) Please consult our company to confirm the reliability of the process required to wash or use or exposure to a chemical solvent used in this product. PCB washing tested to MIL-STD-202 Method, and dry it off immediately.
- (7) The rated current as listed is either the saturation current or the heating current depending on which value is lower.
- (8) If this power choke is dipped in the cleaning agent, such as toluene, xylene, ketone, and ether system, there is a possibility that the performance decreases greatly, and marking disappearnc.
- (9) The high power ultrasonic washing may damage the choke body.
- (10) Before use, the user should determine whether this product is suitable for their own design, Our company only guarantees that the product meets the requirements of this specification.

Application Notice

• **Storage Conditions(component level):**

To maintain the solderability of terminal electrodes:

1. TAI-TECH products meet IPC/JEDEC J-STD-020F standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40℃ and 85% RH.
3. Recommended products should be used within 12 months from the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.
5. Do not expose the products to magnets or magnetic fields.
6. Do not use products that have received any excessive mechanical shock such as by being dropped.
7. Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
8. Due to the application of mechanical stress after mounting and handling such as contact, disconnection may occur.
9. Carefully lay out the coil for the circuit board design of the non-magnetic shield type A malfunction may occur due to magnetic interference.
10. Self heating(temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
11. Soldering corrections after mounting should be within the range of the conditions determined in the specifications. If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
12. When embedding a printed circuit board where a chip is mounted to a set, be sure that residual stress is not given to the chip due to the overall distortion of the printed circuit board and partial distortion such as at screw tightening portions.

• **Conformal coating:**

1. The inductance value may change due to high cure-stress of resin to be used for coating/molding products.
2. An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating condition etc. Please pay careful attention when selecting resin in case of coating/molding process. Prior to use the coating resin, please make sure no reliability issue is observed.

• **Transportation:**

1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

11. Typical Performance Curve

