

# Specification for Approval

**Date:** 2017/05/11

**Customer :** 深圳台慶

**TAI-TECH P/N:** HPC4018BM-Series

**CUSTOMER P/N:** \_\_\_\_\_

**DESCRIPTION:** \_\_\_\_\_

**QUANTITY:** \_\_\_\_\_ pcs

<b>REMARK:</b>		
Customer Approval Feedback		

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## SMD Power Inductor

HPC4018BM-Series

## ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	17/05/11	新發行	羅宜春	梁周虎	張光
備 注					

# SMD Power Inductor

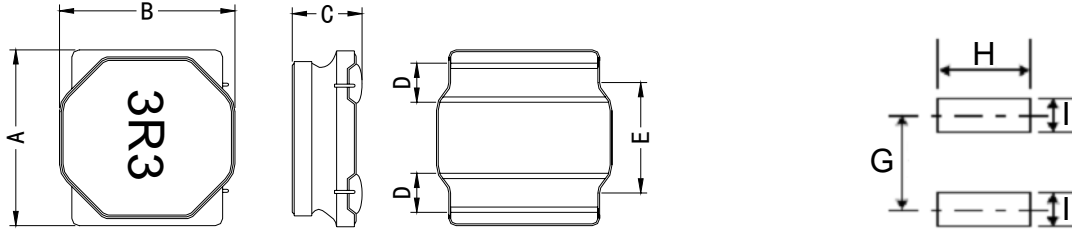
HPC4018BM-Series

## 1. Features

1. This specification applies Low Profile Power Inductors.
2. 100% Lead(Pb) & Halogen-Free and RoHS compliant.



## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	G(mm)	H(mm)	I(mm)
HPC4018BM	4.0±0.2	4.0±0.2	1.8 max.	1.1±0.2	2.5±0.2	2.8 ref.	3.7 ref.	1.2 ref.

Units: mm

## 3. Part Numbering



- A: Series
- B: Dimension
- C: Control S/N
- D: Inductance
- E: Inductance Tolerance

Black marking  
 3R3=3.30uH  
 M=±20% Y=±30%

## 4. Specification

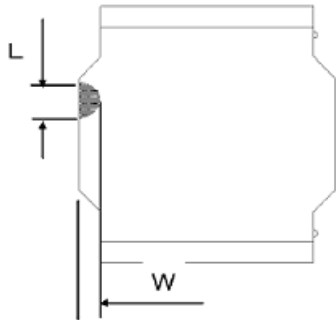
Part Number	Inductance (uH)	Tolerance (%)	Test Frequency (Hz)	SRF (MHz) min.	DCR (Ω) ±20%	I rms (A)	I sat (A)
HPC4018BM-1R0Y	1.0	±30%	1V100K	90	0.027	3.20	4.00
HPC4018BM-1R5Y	1.5	±30%	1V100K	75	0.037	2.40	3.30
HPC4018BM-2R2M	2.2	±20%	1V100K	60	0.042	2.20	3.00
HPC4018BM-3R3M	3.3	±20%	1V100K	45	0.055	2.00	2.30
HPC4018BM-4R7M	4.7	±20%	1V100K	35	0.070	1.70	2.00
HPC4018BM-6R8M	6.8	±20%	1V100K	30	0.098	1.45	1.60
HPC4018BM-100M	10	±20%	1V100K	25	0.150	1.20	1.30
HPC4018BM-150M	15	±20%	1V100K	18	0.210	0.85	1.10
HPC4018BM-220M	22	±20%	1V100K	15	0.290	0.72	0.90
HPC4018BM-330M	33	±20%	1V100K	12	0.460	0.55	0.70
HPC4018BM-470M	47	±20%	1V100K	10	0.650	0.44	0.60
HPC4018BM-680M	68	±20%	1V100K	8.3	1.00	0.32	0.52
HPC4018BM-101M	100	±20%	1V100K	6.5	1.45	0.28	0.42
HPC4018BM-151M	150	±20%	1V100K	5.5	2.30	0.22	0.34
HPC4018BM-221M	220	±20%	1V100K	4.0	3.80	0.17	0.275

Note:

- Isat : Based on inductance change (ΔL/L0 : ≤-30%) @ ambient temp. 25°C
- Irms : Based on temperature rise (ΔT : 40°C typ.)

Core chipping

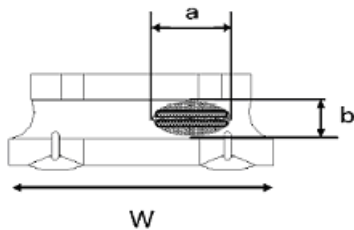
The appearance standard of the chipping size on top side, and bottom side ferrite core is listed below.



Type	L	W
HPC4018BM	1.5mm Max.	1.5mm Max.

Void appearance tolerance Limit

Size of voids occurring to coating resin is specified below.



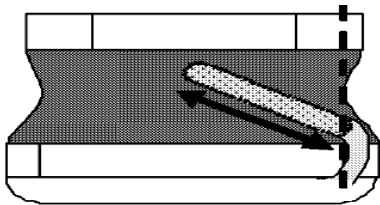
Exposed wire tolerance limit of coating resin part on product side.

Size of exposed wire occurring to coating resin is specified below.

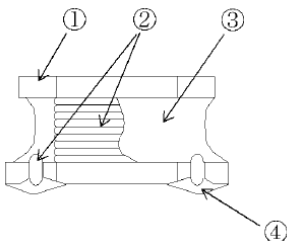
1. Width direction ( dimension a ) : Acceptable when  $a \leq w/2$   
Nonconforming when  $a > w/2$
2. Length direction ( dimension b ) : Dimension b is not specified.
3. The total area of exposed wire occurring to each sides is not greater than 50% of coating resin area, and is acceptable.

External appearance criterion for exposed wire

Exposed end of the winding wire at the secondary side should be 2mm and below.



5. Material List



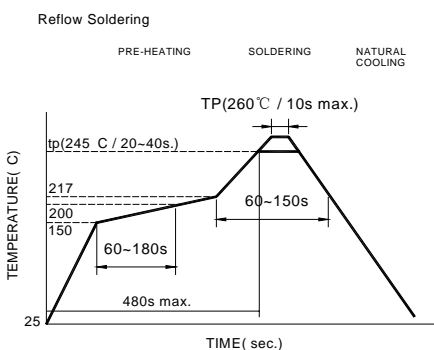
NO	Items	Materials
1.	Core	Ferrite Core
2.	Wire	Enameled Copper Wire
3.	Glue	Epoxy with magnetic powder
4.	Terminal	Ag/Ni/Sn

## 6. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125°C (Including self - temperature rise)	
Storage temperature	-40~+125°C (on board)	
<b>Electrical Performance Test</b>		
Inductance	Refer to standard electrical characteristics list.	HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter.
DCR		CH16502,Agilent33420A Micro-Ohm Meter.
Saturation Current (Isat)	$\Delta L \leq 30\%$ .	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 $\Delta T(^\circ\text{C})$ without core loss. 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer
<b>Reliability Test</b>		
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 $\pm$ 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-020DClassification Reflow Profiles Humidity : $85\pm 2\%$ 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
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 $\pm$ 5min Step2 : $25\pm 2^\circ\text{C}$ $\leq 0.5$ 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:1.52mm $\pm$ 10% Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) *

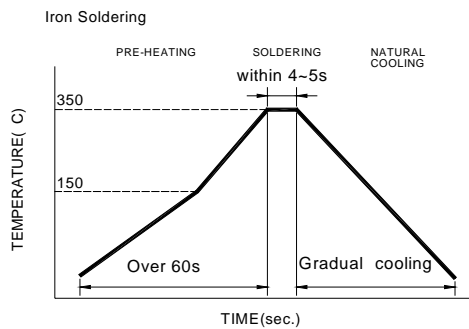
Item	Performance	Test Method and Remarks															
Thermal shock		<p>The test samples shall be soldered to the test board by the reflow.</p> <p>The test samples shall be placed at specified temperature for specified time by step 1 to step 4 as shown below in sequence.</p> <p>The temperature cycles shall be repeated 100 cycles .</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Temperature(°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±2°C</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temp</td> <td>Within3</td> </tr> <tr> <td>3</td> <td>125±2°C</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temp</td> <td>Within3</td> </tr> </tbody> </table>	Phase	Temperature(°C)	Time (min.)	1	-40±2°C	30±3	2	Room Temp	Within3	3	125±2°C	30±3	4	Room Temp	Within3
Phase	Temperature(°C)	Time (min.)															
1	-40±2°C	30±3															
2	Room Temp	Within3															
3	125±2°C	30±3															
4	Room Temp	Within3															
Damp heat life test		<p>Test Method and Remarks The test samples shall be soldered to the test board by the reflow.</p> <p>The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below.</p> <p>Temperature: 60±2 C Humidity: 90~95%RH Time: 500+24/-0 hrs</p>															
Loading under damp heat life test	Inductance change : Within±10% No abnormality observed in appearance.	<p>The test samples shall be soldered to the test board by the reflow.</p> <p>The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below.</p> <p>Temperature: 60±2 C Humidity: 90~95%RH Applied current: Rated current Time: 500+24/-0 hrs</p>															
Low temperature life test		<p>The test samples shall be soldered to the test board by the reflow.</p> <p>After that, the test samples shall be placed at test conditions as shown in below.</p> <p>Temperature:-40±2°C Time: 500±8 hrs.</p>															
Loading at high temperature life test		<p>The test samples shall be soldered to the test board by the reflow.</p> <p>Temperature: 125±2°C. Applied current: Rated current Time: 500±8 hrs.</p>															

### 7.Soldering



Reflow times: 3 times max.

Fig.1

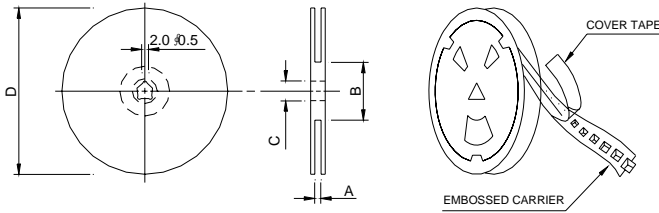


Iron Soldering times: 1 times max.

Fig.2

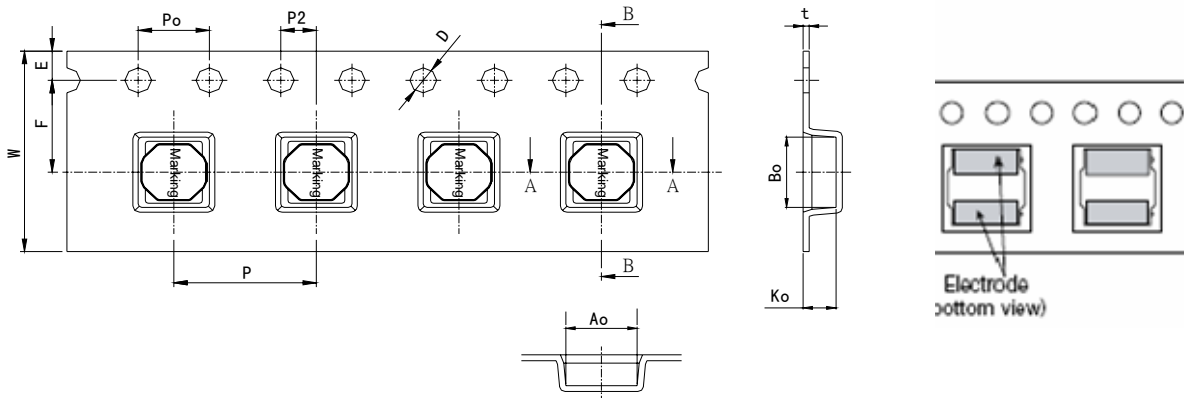
## 8. Packaging Information

### (1) Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x12mm	13.4±2.0	80±2.0	13±0.5/-0.2	330±3.0

### (2) Tape Dimension

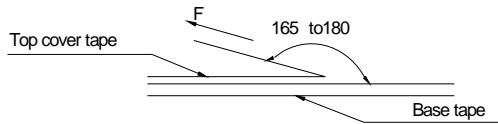


Series	Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	w(mm)	t(mm)	Emm	F(mm)	D(mm)	Po(mm)	P2(mm)
HPC	4018	4.4±0.1	4.4±0.1	2.0±0.1	8.0±0.1	12±0.3	0.35±0.1	1.75±0.1	5.50±0.1	1.5±0.1	4.0±0.1	2.00±0.1

### (3) Packaging Quantity

HPC	4018
Chip / Reel	3500

### (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-C-2003 of 4.11 stadnard).

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

#### Application Notice

- Storage Conditions

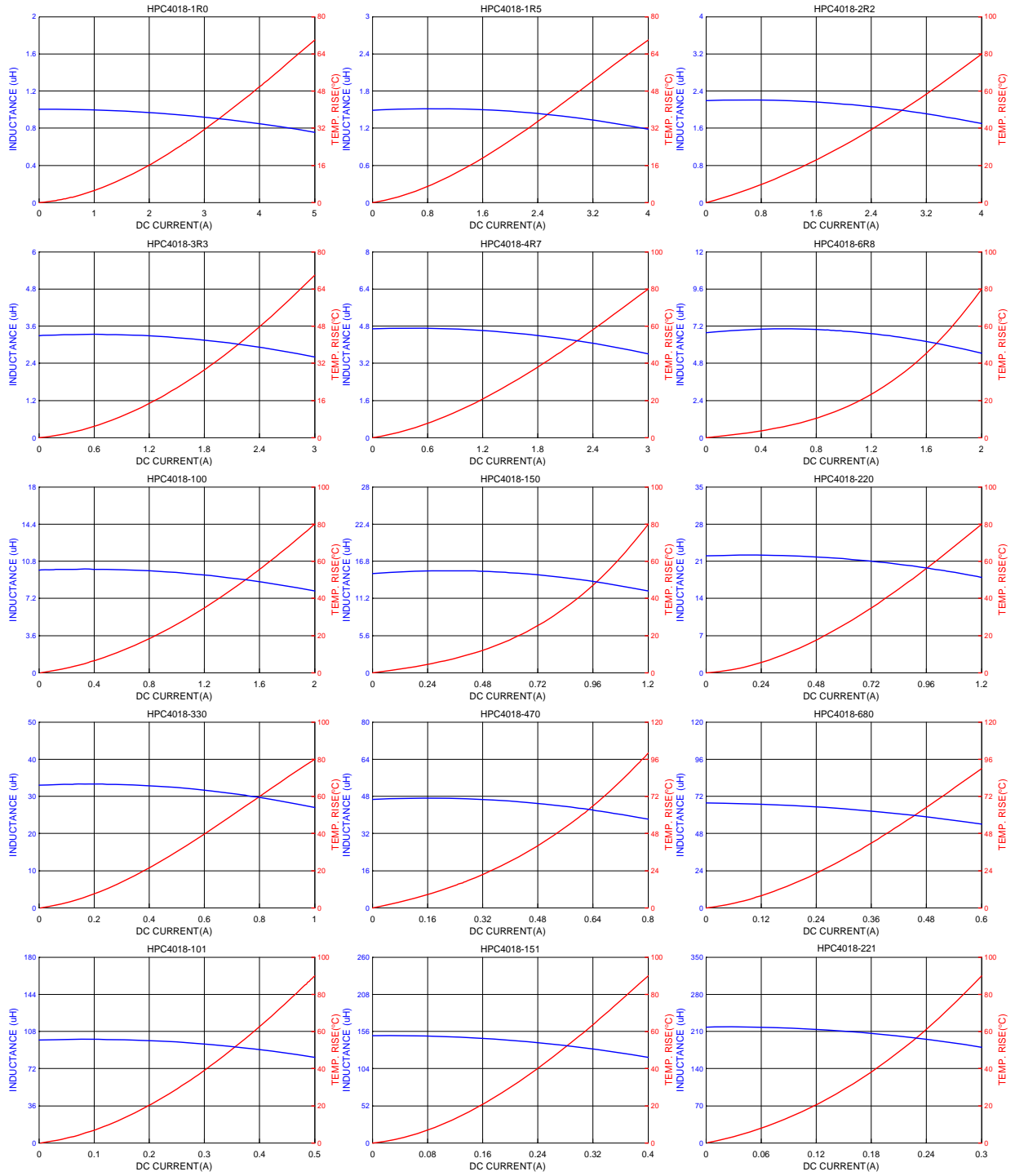
To maintain the solderability of terminal electrodes:

1. TAIPAQ products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40°C and 60% RH.
3. Recommended products should be used within 12 months form the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.

- 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.

### 9. Typical Performance Curves





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