Power Inductor

HPC3012TF-SERIES

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	14/04/14	新 發 行	楊祥忠	詹偉特	羅文鍵
備 註					

Power Inductor

HPC3012TF-SERIES

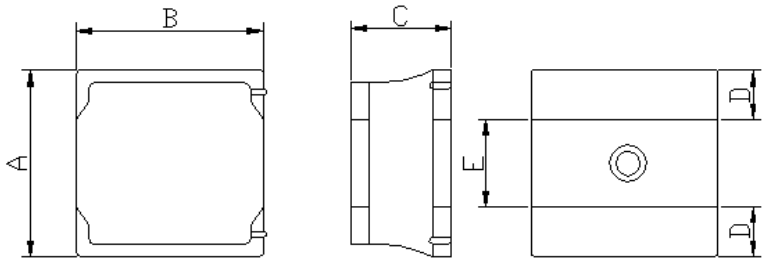
1. Features

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

Halogen-free

Pb-free

2. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
HPC3012TF	3.0±0.2	3.0±0.2	1.2 max.	1.0 ref.	1.0 ref.

Units: mm

3. Part Numbering

HPC	3012	TF	-	4R7	M
A	B	C		D	E

A: Series
B: Dimension
C: Lead Free
D: Inductance 4R7=4.7uH
E: Inductance Tolerance M=±20% ；Y=±30%

4. Specification

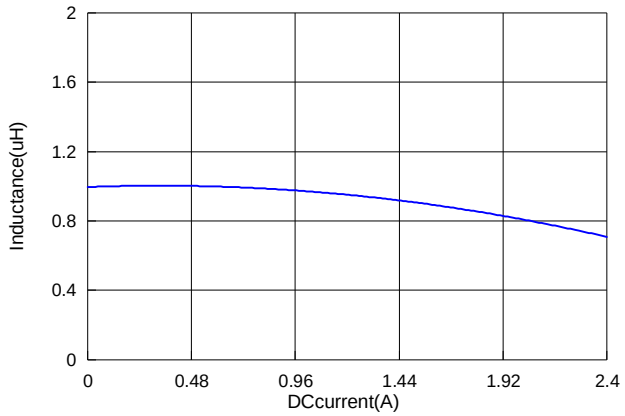
TAI-TECH Part Number	Inductance (uH)	Tolerance (%)	Test Frequency (Hz)	DCR (Ω) ±20%	I sat (A) typ.	I rms (A) typ.
HPC3012TF-1R0Y	1.0	±30%	0.1V/1M	0.042	2.15	2.00
HPC3012TF -1R5Y	1.5	±30%	0.1V/1M	0.056	1.70	1.85
HPC3012TF -2R2M	2.2	±20%	0.1V/1M	0.080	1.50	1.70
HPC3012TF -3R3M	3.3	±20%	0.1V/1M	0.100	1.20	1.55
HPC3012TF -4R7M	4.7	±20%	0.1V/1M	0.130	1.05	1.30
HPC3012TF -6R8M	6.8	±20%	0.1V/1M	0.180	0.90	1.05
HPC3012TF -100M	10	±20%	0.1V/1M	0.245	0.76	0.89
HPC3012TF -150M	15	±20%	0.1V/1M	0.386	0.62	0.74
HPC3012TF -220M	22	±20%	0.1V/1M	0.580	0.49	0.61

Note:

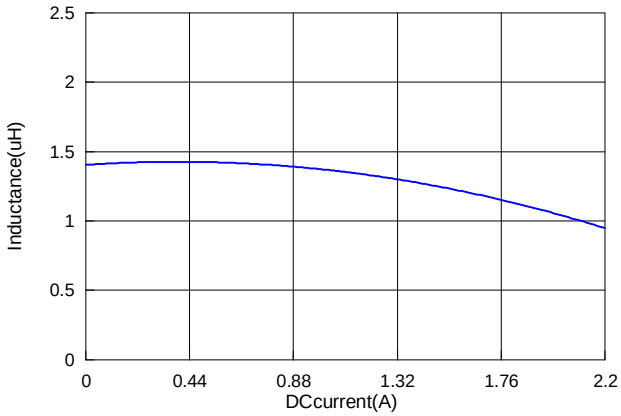
Isat：Based on inductance change （△L/L0：≦-30%）@ ambient temp. 25℃

Irms：Based on temperature rise （△T：40℃.）Max

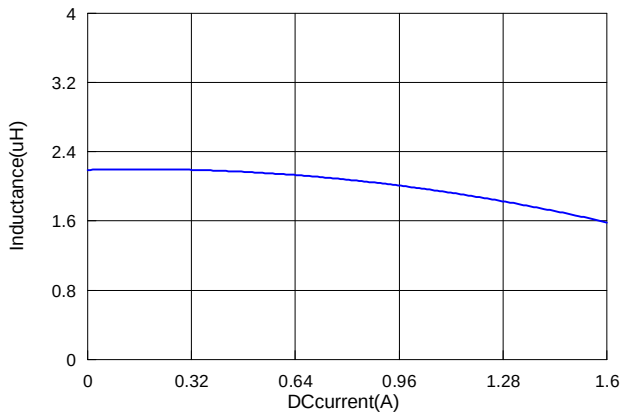
HPC3012TF-1R0



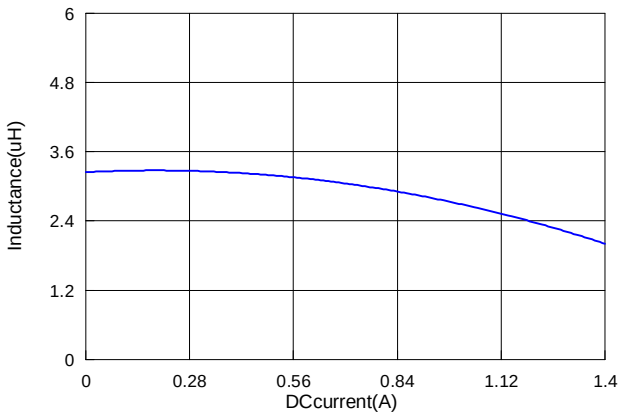
HPC3012TF-1R5



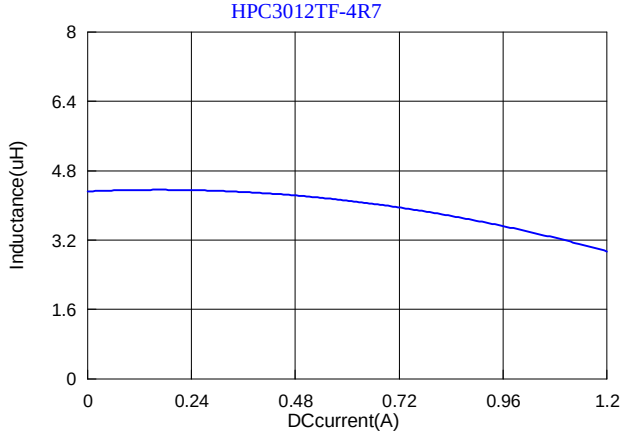
HPC3012TF-2R2



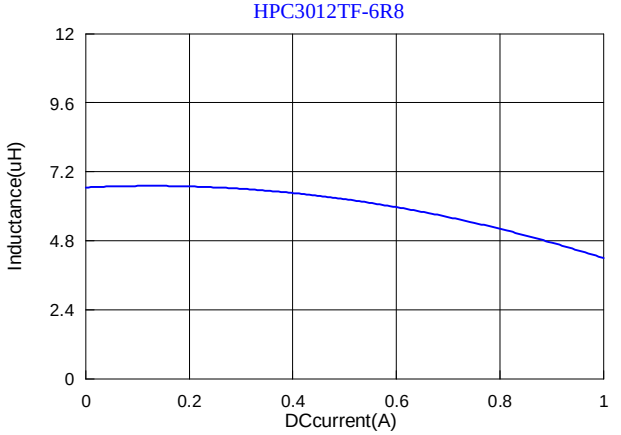
HPC3012TF-3R3



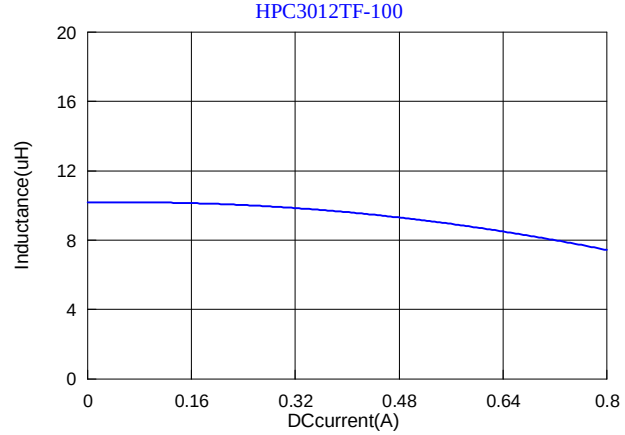
HPC3012TF-4R7



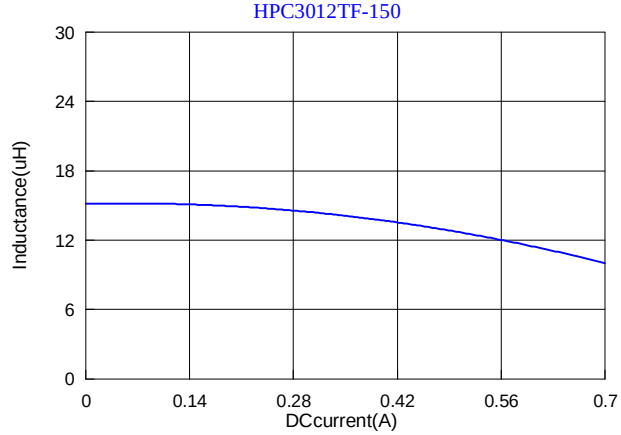
HPC3012TF-6R8

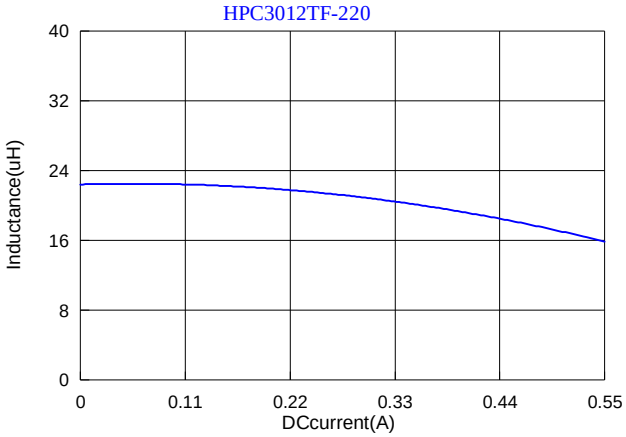


HPC3012TF-100



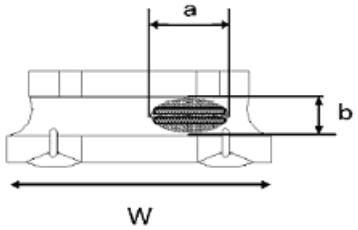
HPC3012TF-150





Void appearance tolerance Limit

Size of voids occurring to coating resin is specified below.



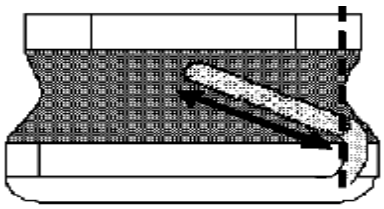
Exposed wire tolerance limit of coating resin part on product side.

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

1. Width direction（dimension a）: Acceptable when a≦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.

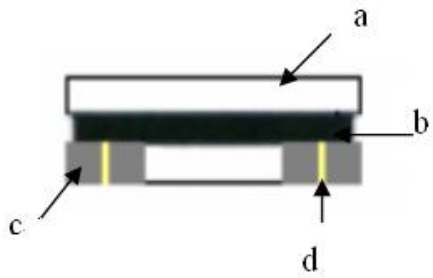
External appearance criterion for exposed wire

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



5. Material

No.	Description	Specification
a.	Core	Ferrite Core
b.	Coating	Epoxy
c	Termination	Tin (Pb Free)
d	Wire	Enameled Copper Wire



6. Reliability and Test Condition

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Operating Temperature</td><td>-55~+125℃(For products in unopened tape package, less than 40℃)</td><td></td></tr>
<tr><td colspan="3">Electrical Performance Test</td></tr>
<tr><td>Inductance L</td><td rowspan="2">Refer to standard electrical characteristic list</td><td>Agilent-4291, Agilent-4287</td></tr>
<tr><td>DC Resistance</td><td>Agilent-4338</td></tr>
<tr><td>Rated Current</td><td>Base on temp. rise & △L/L0A≦30%.</td><td>Saturation DC Current (Isat) will cause L0
to drop approximately △L(%).</td></tr>
<tr><td>Temperature Rise Test</td><td>ΔT 40℃Max</td><td>Heat Rated Current (Irms) will cause the coil temperature rise
approximately △T(℃) without core loss.
1.Applied the allowed DC current.
2.Temperature measured by digital surface thermometer</td></tr>
<tr><td colspan="3">Mechanical Performance Test</td></tr>
<tr><td>Solder Heat Resistance</td><td>Appearance：No damage.
Inductance：within±10% of initial value
RDC：within ±15% of initial value and shall not exceed the specification value</td><td><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>Depth: completely cover the termination</td></tr>
<tr><td>Solderability Test</td><td>More than 95% of terminal electrode should be covered with solder.</td><td>Preheat: 150℃,60sec.。
Solder: Sn99.5%-Cu0. 5%。
Temperature: 245±5℃。
Flux for lead free: Rosin. 9.5%。
Dip time: 4±1sec。
Depth: completely cover the termination</td></tr>
<tr><td colspan="3">Reliability Test</td></tr>
<tr><td>Life Test</td><td rowspan="4">Appearance：No damage.
Inductance：within±10% of initial value
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
Temperature：125±2℃(Bead)
Temperature： 85±2℃(Inductor)
Applied current：rated current
Duration：1000±12hrs
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Thermal shock</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
Step1：-40±2℃ 30±5min
Step2：25±2℃ ≦0.5min
Step3：105±2℃ 30±5min
Number of cycles： 500
Measured at room fempraturc after placing for 24±2 hrs</td></tr>
<tr><td>Humidity Resistance Test</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
Humidity：85±2% R.H,
Temperature：85℃±2℃
Duration：1000hrs Min. with 100% rated current
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Vibration Test</td><td>Preconditioning:Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
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)。</td></tr>
</table>

7. Soldering and Mounting

7-1. Soldering

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

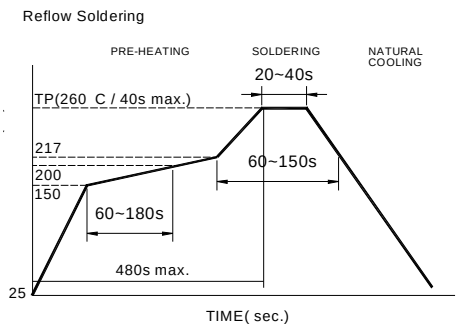
7-1.1 Solder re-flow:

Recommended temperature profiles for re-flow soldering in Figure 1.

7-1.2 Soldering Iron(Figure 2):

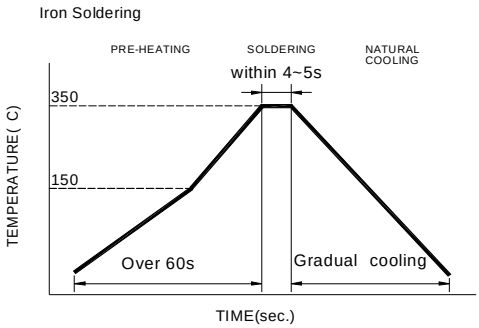
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

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



Reflow times: 3 times max.

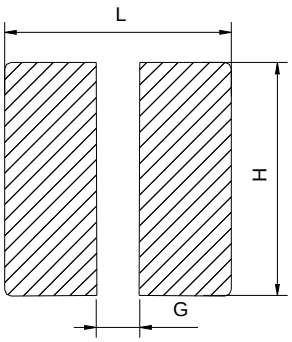
Fig.1



Iron Soldering times: 1 times max.

Fig.2

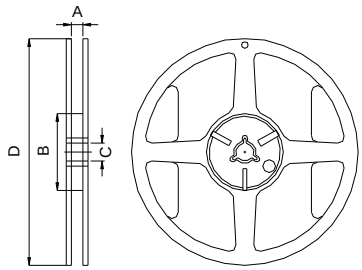
7-2. Recommended PC Board Pattern



L(mm)	G(mm)	H(mm)
3.2	1.0	3.2

8. Packaging Information

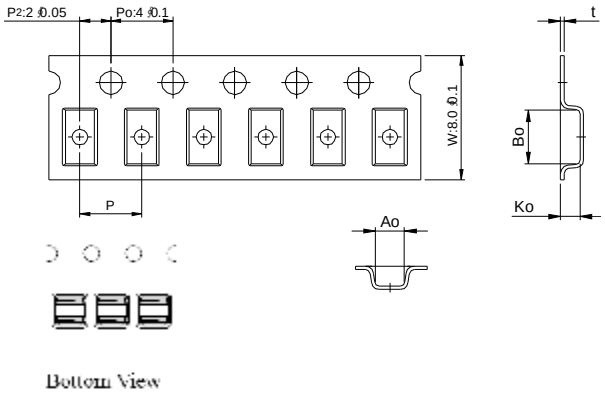
8-1. Reel Dimension



7"x8mm

Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	8.4±1.0	50 min.	13±0.8	178±2

8-2. Tape Dimension / 8mm



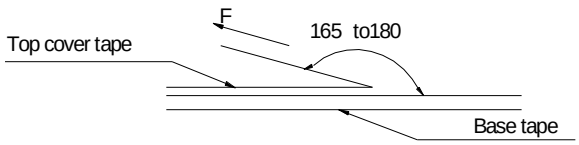
Bottom View

Series	Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
HPC	3012	3.2±0.05	3.2±0.05	1.40±0.2	4.0±0.05	0.23±0.05

8-3. Packaging Quantity

Chip size	3012
Chip / Reel	2000

8-4. Tearing Off Force



The force for tearing off cover tape is 15 to 80 grams in the arrow direction under the following conditions.

Room Temp. (℃)	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. TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
  2. Temperature and humidity conditions: Less than 40℃ and 60% RH.
  3. Recommended products should be used within 12months 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.