

Power Inductor

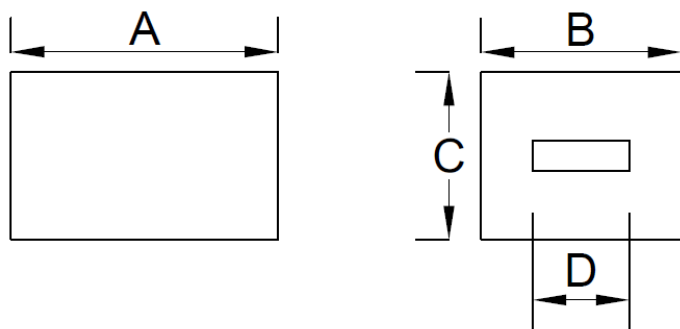
BPH403025W4-530T

1. Features

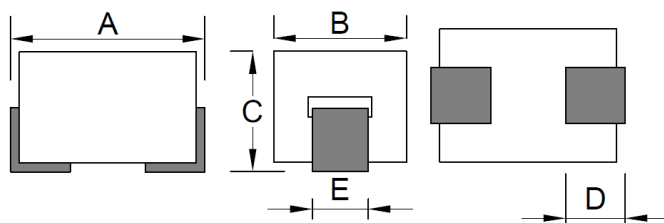
- 100% Lead(Pb) & Halogen-Free and RoHS compliant.
- Operating temperature-40~+125°C (Including self - temperature rise)



2. Dimension



CORE SIZE			
A(mm)	B(mm)	C(mm)	D(mm)
4.00 ±0.25	3.10 ±0.15	2.50 ±0.15	1.50 ±0.15



PRODUCT SIZE				
A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
4.30~5.10	3.1 ±0.15	2.70~3.1	1.35±0.20	1.35±0.15

3. Part Numbering

BPH	403025	W4	-	530	T
A	B	C		D	E

A: Series

B: Dimension

C: Material

Ferrite Core

D: Impedance

530=53Ω

E: Packaging

T=Taping and Reel

4. Specification

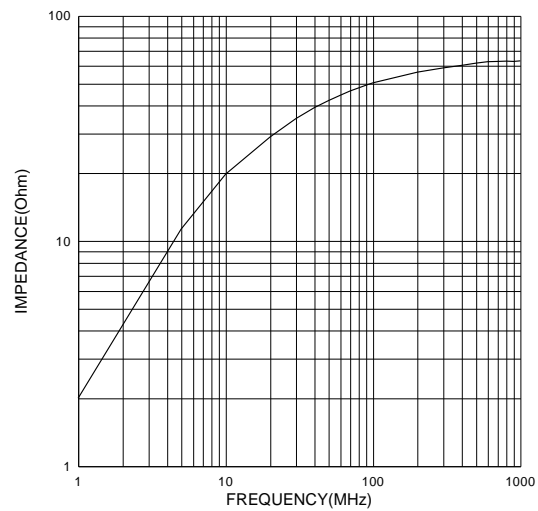
TAI-TECH Part Number	ELECTRICAL REQUIREMENTS 1			ELECTRICAL REQUIREMENTS 2			DCR (mΩ) Max.	Rated Current(A)	
	Impedance (Ω)	Tolerance (%)	Test Frequency (MHz)	Impedance (Ω)	Tolerance (%)	Test Frequency (MHz)		ΔT=40°C TYP.	ΔT=60°C TYP.
BPH403025W4-530T	35	±25	25	53	±25	100	0.60	35.0(1) 15.0(2)	45.0(1) 18.0(2)

Note:

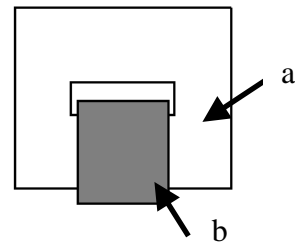
Rated Current :

(1) : Chroma high current test fixture.

(2) :PCB test fixture (30x45mm copper pattern , 50um copper thickness).

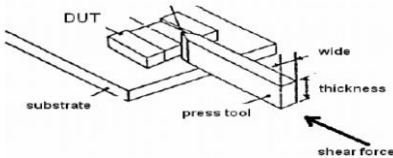
Typical Impedance v.s. Frequency Curve**5. Material List**

No.	Description	Specification
a.	Core	Ferrite Core
b.	Wire	Electroplated nickel-tin flat copper wire (1.25W X 0.20T)m/m



6. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	-40~+125℃ (on board)	
Electrical Performance Test		
Z(Impedance)	Refer to standard electrical characteristics list.	Agilent E4991A,Agilent Fixture 16197A
DCR		LCR Meter. Agilent33420A Micro-Ohm Meter.
Heat Rated Current (Irms)	Approximately $\Delta T \leq 40^{\circ}\text{C}$	Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T(^{\circ}\text{C})$ without core loss. 1.Applied the allowed DC current(keep 1 min.). 2.Temperature measured by digital surface thermometer
Reliability Test		
Life Test	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	Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DCclassification 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-020DCclassification 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
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DCclassification Reflow Profiles) 1. Baked at 50°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°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°C in 2.5hrs,keep at 25°C for 2 hrs then keep at -10°C for 3 hrs 4. Keep at 25°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-020DCclassification Reflow Profiles) Condition for 1 cycle Step1 : $-40 \pm 2^{\circ}\text{C}$ 30 \pm 5min Step2 : $25 \pm 2^{\circ}\text{C}$ \leq 0.5min 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 Condition														
Bending	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	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		<table><tr><th>Type</th><th>Peak value (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)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>	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
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												
Solder ability	More than 95% of the terminal electrode should be covered with solder.	Preheat: 150℃,60sec.。 Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245±5℃。 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><tr><th>Temperature(℃)</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(℃)	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(℃)		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-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. 														

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.

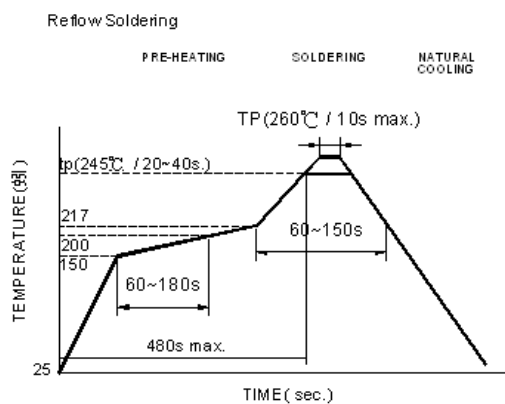
7-1.1 Solder re-flow:

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

7-1.2 Soldering Iron(Figure 2):

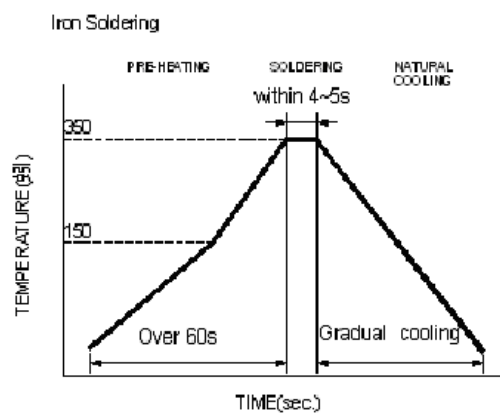
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5 sec.



Reflow times: 3 times max.

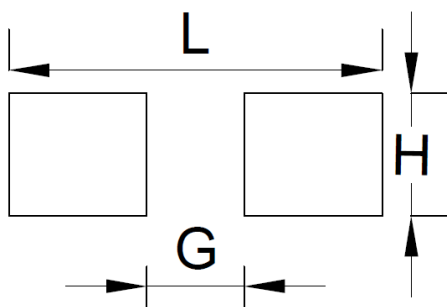
Fig.1



Iron Soldering times: 1 times max.

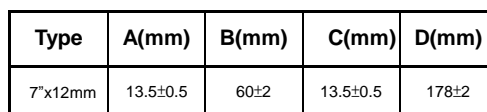
Fig.2

7-2. Recommended PC Board Pattern



L(mm)	G(mm)	H(mm)
4.8	1.4	1.5

8-1. Reel Dimension



Technical drawing of a multi-hole plate. The main view shows a rectangular plate with width W and length P . It features a series of holes with diameter D_1 and a central rectangular slot with width A . Dimensions P_0 , P_2 , B , E , and F are indicated. Two section views are provided: a side view showing thickness t , slot width B_0 , and offset S ; and a cross-section view showing slot width A_0 and depth B^* .

Series	Size	W(mm)	P(mm)	Po(mm)	Ao(mm)	Bo(mm)	Ko(mm)	t(mm)
BPH	403025	12±0.10	8.0±0.10	4.0±0.10	3.30±0.10	4.8±0.10	3.1±0.10	0.28±0.05

Chip size	Chip / Reel	Inner box	Middle box	Carton
BPH403025	500	2000	10000	20000

Top cover tape

F

$165^\circ \text{ to } 180^\circ$

Base tape

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

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

- Storage Conditions(component level)
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 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.