



## Power Inductor EBP04 A Series Product Specifications

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### ■ Power Inductor — EBP04 A Series



#### ■ Application

- Laptops and PCs
- Switch and servers
- Base stations
- DC/DC converters
- Battery powered devices
- SSD modules

#### ■ Features

- 100% Lead(Pb)-Free and RoHS compliant.
- High current, low DCR, high efficiency.
- Magnetically shielded structure to accomplish high resolution in EMC protection.
- Operating temperature -55°C~+125°C(Including self - temperature rise) .
- High reliability by original structure.
- Low core loss
- Ultra low buzz noise due to molding construction
- For general electronic equipment

### ■ Parts Number Explanation

Example:

EBP	0410	A	—	R47	M	—	T	W	Z
Product Type	Size (mm)	Application		Inductance ( uH )	Tolerance		Package	Internal Code	Optional
Molding Power Inductor	0410 0412 0420			R47 : 0.47uH R68 : 0.68uH	M : ±20%		T : Taping		Z : Default Code



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### ■ Standard Electrical Specifications

Part No.	Inductance	DC Resistance	Saturation Current	Heating Rating Current
	L0 (μH)	DCR (mΩ)	Isat (A)	Irms (A)
	±20 %, 100 kHz, 1V	MAX.	TYP.	TYP.
EBP0410A-2R2M-TWZ	2.2	100	4.3	3.4
EBP0410A-4R7M-TWZ	4.7	160	2.5	2.6
EBP0410A-100M-TWZ	10	336	1.8	1.5
EBP0412A-R15M-TWZ	0.15	9	15	7.5
EBP0412A-R22M-TWZ	0.22	11	11	7
EBP0412A-R33M-TWZ	0.33	19	8.4	6.5
EBP0412A-R47M-TWZ	0.47	21	6.8	6
EBP0412A-R68M-TWZ	0.68	36	6	4.7
EBP0412A-1R0M-TWZ	1.0	47	5.5	4.5
EBP0412A-1R5M-TWZ	1.5	75	4	3.25
EBP0412A-2R2M-TWZ	2.2	83.5	3	2.75
EBP0412A-4R7M-TWZ	4.7	195	2.2	1.8
EBP0420A-R10M-TWZ	0.1	4	22	13
EBP0420A-R22M-TWZ	0.22	6.6	12.5	9.5
EBP0420A-R33M-TWZ	0.33	11	12	10
EBP0420A-R47M-TWZ	0.47	14	9.5	7.5
EBP0420A-R56M-TWZ	0.56	16	9	7
EBP0420A-R68M-TWZ	0.68	18	8	7
EBP0420A-1R0M-TWZ	1.0	27	7	6
EBP0420A-1R2M-TWZ	1.2	27	6.5	6
EBP0420A-1R5M-TWZ	1.5	46	5.5	5
EBP0420A-2R2M-TWZ	2.2	58	5	4.5
EBP0420A-3R3M-TWZ	3.3	87	3.5	3.3
EBP0420A-4R7M-TWZ	4.7	105	3	2.8
EBP0420A-6R8M-TWZ	6.8	175	2.5	2.4
EBP0420A-100M-TWZ	10	282	2	1.6
EBP0420A-220M-TWZ	22	363	1.4	1.2



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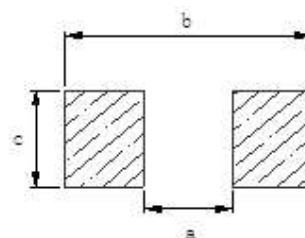
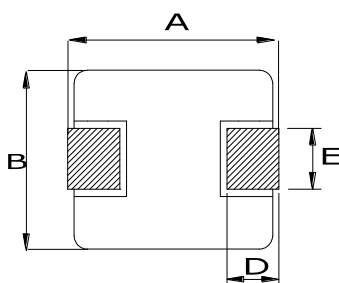
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### Notes:

1. All test data is referenced to 25 °C ambient
2. Operating temperature range - 55 °C to + 125 °C
3. I<sub>rms</sub> (A):DC current (A) that will cause an approximate  $\Delta T$  of 40 °C(reference ambient temperature is 25 °C)
4. I<sub>sat</sub>(A):DC current (A) that 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 placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

## ■ Dimensions



Recommend Land Pattern

Unit: mm

Type	A	B	C	D	E	a typ	b typ	c typ
EBP0410A	4.1±0.35	4.1±0.25	0.8±0.2	0.8±0.3	1.8±0.3	2.2	4.4	2.2
EBP0412A	4.4±0.35	4.2±0.25	1.0±0.2	0.8±0.3	2.0±0.3	2.2	5.2	2.5
EBP0420A	4.4±0.35	4.2±0.25	1.8±0.2	0.8±0.3	2.0±0.3	2.2	5.2	2.5


## ■ Marking

- The inductor is marked with a 3-digit code

Nominal Inductance	
Example	Nominal Value
1R0	1.0 $\mu$ H
100	10 $\mu$ H
101	100 $\mu$ H

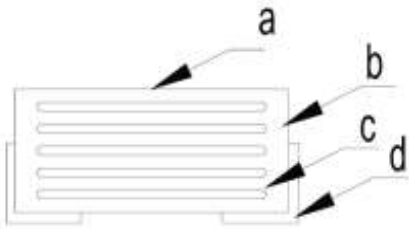


Note : Using Ink for marking

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■ **Structure and Components**

Symbol	Components	Material
a	MARKING	Ink (black)
b	CORE	Alloy Sponge Powder
c	WIRE	Polyurethane copper wire
d	TERMINAL	Copper plated with Sn





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### ● Reliability test and requirement

#### Mechanical Reliability

Item	Specification and Requirement	Test Method
Solderability	1. No case deformation or change in appearance. 2. New solder coverage More than 95%	1.Preheat: $155^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , $60\text{S} \pm 2\text{S}$ 2.Tin: lead-free. 3.Temperature: $240^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , flux $3.0\text{S} \pm 0.5\text{S}$ .
Mechanical shock	1. No case deformation or change in appearance 2. $\Delta L/L_0 \leq \pm 10\%$	1. Acceleration: 100G 2. Pulse time: 6ms 3. 3 times in each positive and negative direction of 3 mutual perpendicular directions
Mechanical vibration	1. No case deformation or change in appearance 2. $\Delta L/L_0 \leq \pm 10\%$	1. Reflow: 2times 2. Frequency: $10\text{HZ} \sim 55\text{HZ} \sim 10\text{HZ}$ , 20 Min/Cycles 3. Amplitude: 1.52 mm 4. Directions: X,Y,Z 5. Time: 12 cycle / direction

#### Endurance Reliability

Item	Specification and Requirement	Test Method
Thermal Shock	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1. First $-55^{\circ}\text{C}$ for 30 minutes, last $125^{\circ}\text{C}$ for 30 minutes as 1 cycle. Go through 1000 cycles. 2. Max transfer time is 3 minutes. 3. Measured at room temperature after placing for $24 \pm 2$ hours
Humidity Resistance	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1.Reflow 2 times, 2. $85^{\circ}\text{C}$ ,85%RH,1000 hours 3.Measured at room temperature after placing for $24 \pm 2$ hours
Low temperature storage	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1. Temperature: $-55 \pm 2^{\circ}\text{C}$ 2. Time: 1000 hours 3. Measured at room temperature after placing for $24 \pm 2$ hours
High temperature storage	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1. Temperature: $+125 \pm 2^{\circ}\text{C}$ 2. Time: 1000 hours 3. Measured at room temperature after placing for $24 \pm 2$ hours



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### ■ Recommended Soldering Technologies:

#### (1) Re-flowing Profile

Preheat condition: 150 ~200°C/60~120sec.

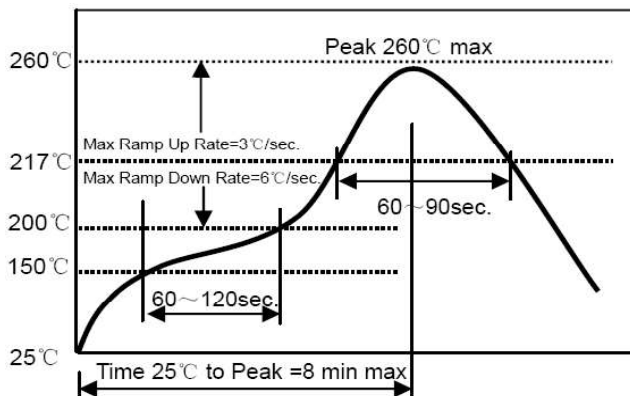
Allowed time above 217°C: 60~90sec.

Max temp: 260°C

Max time at max temp: 10 sec.

Solder paste: Sn/3.0Ag/0.5Cu

Allowed Reflow time: 2x max



#### (2) Iron Soldering Profile

Iron soldering power: Max. 30W

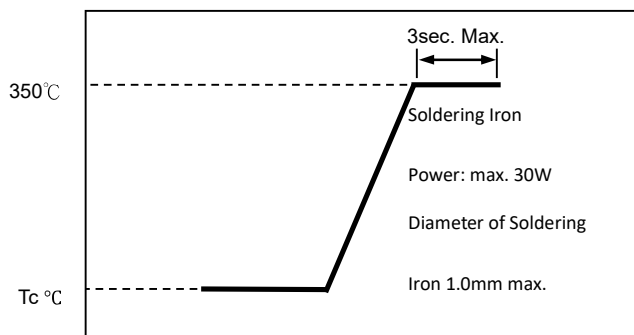
Pre-heating: 150°C/60sec.

Soldering Tip temperature: 350°C Max.

Soldering time: 3sec. Max.

Solder paste: Sn/3.0Ag/0.5Cu

Max.1 times for iron soldering



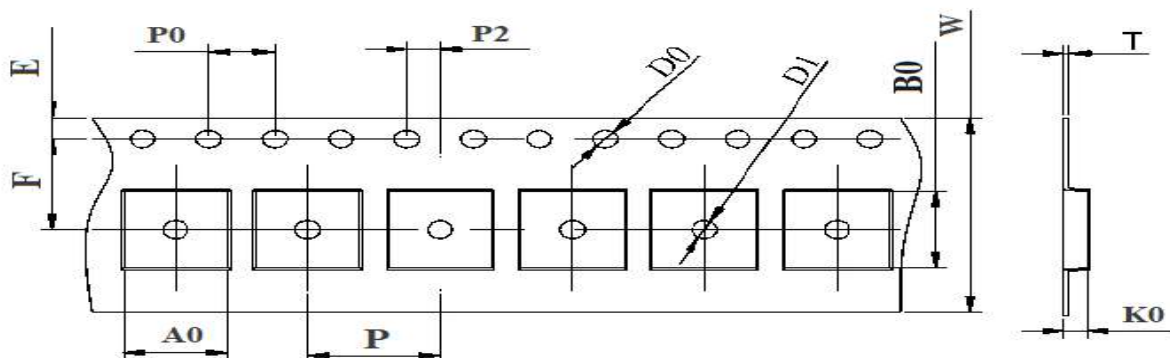


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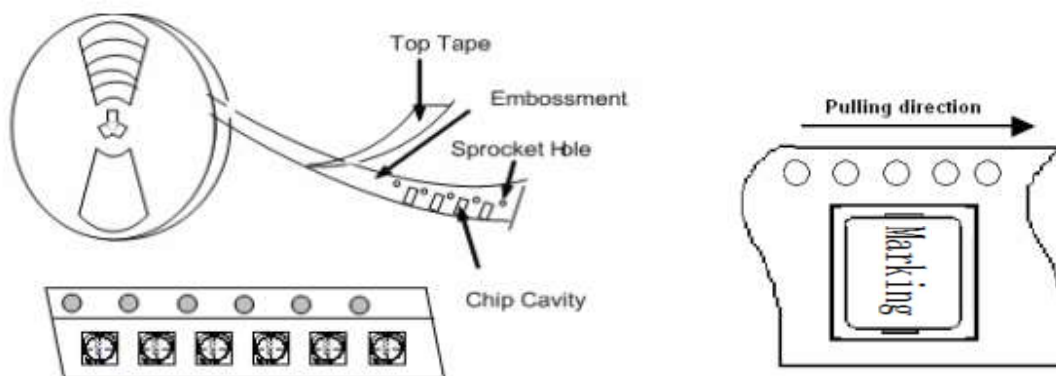
### ■ Packaging Information

#### (1) Tape Packaging Dimensions (Unit : mm)



Type	Tape dimensions (mm)											
	W	P	P0	P2	D0	D1	T	A0	B0	K0	E	F
EBP0410A	12±0.3	8±0.1	4±0.1	2±0.1	1.5±0.1	1.5±0.1	0.30±0.05	4.5±0.1	4.50±0.1	1.10±0.1	1.75±0.1	5.5±0.1
EBP0412A	12±0.3	8±0.1	4±0.1	2±0.1	1.5±0.1	1.5±0.1	0.35±0.05	4.5±0.1	4.85±0.1	1.50±0.1	1.75±0.1	5.5±0.1
EBP0420A	12±0.3	8±0.1	4±0.1	2±0.1	1.5±0.1	1.5±0.1	0.35±0.05	4.5±0.1	4.85±0.1	2.30±0.1	1.75±0.1	5.5±0.1

#### (2) Taping Drawings (Unit : mm)

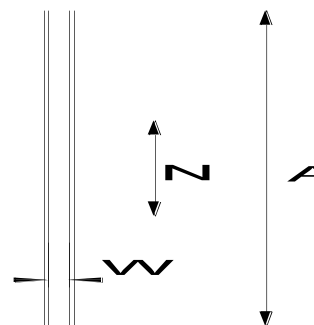
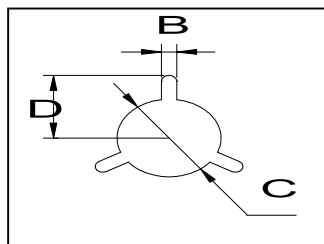
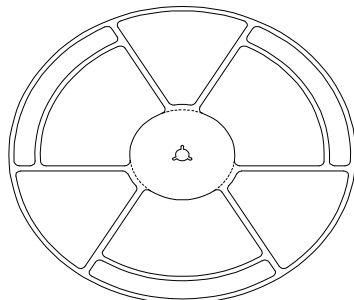




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### (3) Reel Dimensions (Unit : mm)



Type	Reel dimensions (mm)					
	A	W	N	B	C	D
EBP0410A	330+2.0	12.8±0.2	97±0.5	2.2+0.5	13.0±0.2	10.75±0.25
EBP0412A						
EBP0420A						

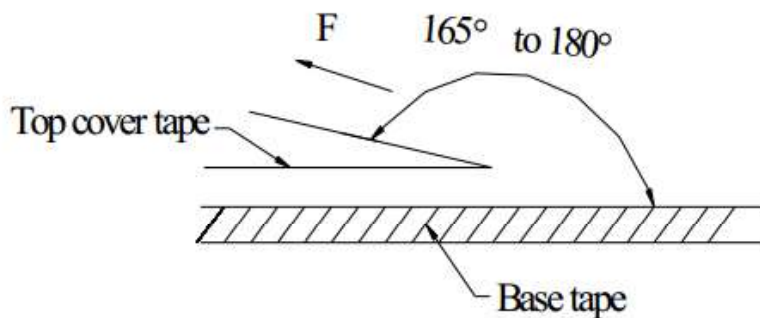
### (4) Packaging Quantity(PCS)

Type	Standard Quantity		
	Reel	Inner box	Carton box
EBP0410A	5,000 pcs / reel	2Reel / box (10,000 pcs)	4 Middle boxes, (40,000 pcs)
EBP0412A	3,000 pcs / reel	4Reel / box (12,000 pcs)	4 Middle boxes, (48,000 pcs)
EBP0420A	3000 pcs / reel	4Reel / box (12000 pcs)	4 Middle boxes, (48,000 pcs)

### (5) Peel force of top cover tape

The peel speed shall be about 300mm/minute

The peel force of top cover tape shall be between 0.1 to 1.3 N





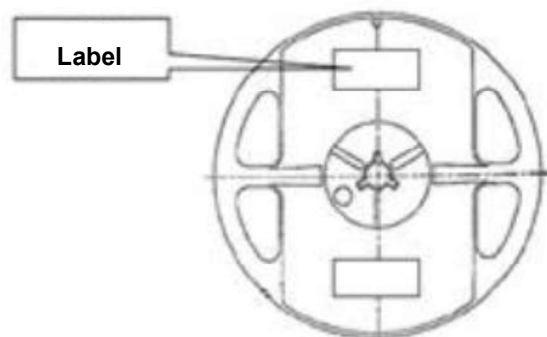


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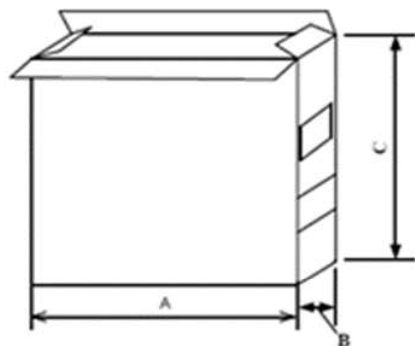
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## **(6) Reel Label**

- Label on the reel
  - Everohms part Number.
  - Lot Number
  - Quantity
  - Description
- Shipping Label
  - Customer's part Number
  - Manufacturer's part Number
  - Quantity
  - date code

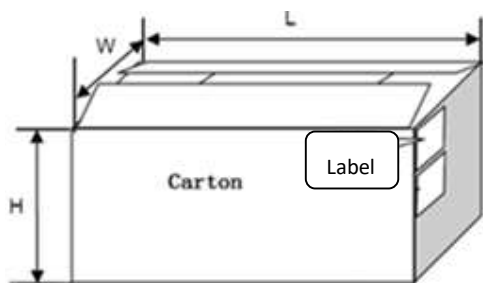


## **(7) Inner Box**



Packaging Type	A (mm)	B (mm)	C (mm)
Inner box	335	70	340

## **(8) Carton**



Packaging Type	L (mm)	W (mm)	H (mm)
Carton	360	360	360