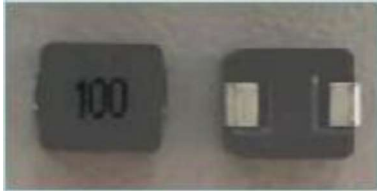




# Power Inductor EBP0530P-TWA Product Specifications

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## ■ Power Inductor — EBP0530P-TWA Series



### ■ Application

- Automotive applications

### ■ Features

- ROHS · Halogen Free and REACH compliance.
- High current, low DCR, high efficiency.
- Operating temperature -55°C~+125°C(Including self - temperature rise)
- AEC-Q200 qualified.

## ■ Parts Number Explanation

Example:

EBP	0530	P	1R0	M	T	W	A
<b>Product Type</b>	<b>Size (mm)</b>	<b>Application</b>	<b>Inductance (uH)</b>	<b>Tolerance</b>	<b>Package</b>	<b>Internal Code</b>	<b>Optional</b>
Molding Power Inductor			1R0 : 1.0uH 1R5 : 1.5uH 2R2 : 2.2uH	M : ±20%	T : Taping		A : For Automotive Electronics



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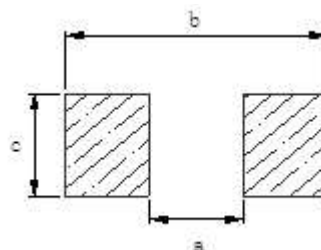
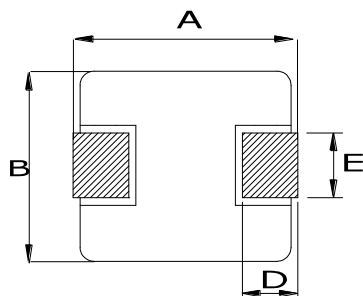
### ■ Standard Electrical Specifications

Part No.	Inductance	DC Resistance	Saturation Current		Heating Rating Current	
	L0 ( $\mu$ H)	DCR (m $\Omega$ )	Isat (A)		Irms (A)	
	$\pm 20\%$ , 100 kHz, 1V	MAX.	Typ	Max	Typ	Max
EBP0530P-1R0M-TWA	1.0	9.8	18	16	9.5	9
EBP0530P-1R5M-TWA	1.5	15	13.5	12.5	8	7.5
EBP0530P-2R2M-TWA	2.2	20	12.5	11.5	6.5	6

#### Notes:

1. All test data is referenced to 25 °C ambient
2. Operating temperature range - 55 °C to + 125 °C
3. Irms (A): DC current (A) that will cause an approximate  $\Delta T$  of 40 °C, (reference ambient temperature is 25 °C)
4. Isat(A): DC current (A) that will cause L0 to drop approximately 30 %
5. The rated current as listed is either the saturation current or the heating current depending on which value is lower.
6. 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.
7. Cleaning Process Note
  - (a) 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
  - (b) The high power ultrasonic washing may damage the choke body.
  - (c) Please contact us if you need the cleaning via the above agents or ultrasonic washing.

## ■ Dimensions



Recommend Land Pattern

Unit: mm

Type	A	B	C	D	E	a typ	b typ	c typ
EBP0530P-TWA	5.7 ±0.3	5.2 ±0.20	2.8 ±0.2	1.2 ±0.2	2.0 ±0.3	2.2	6.0	2.5

## ■ Marking

- The inductor is marked with a 3-digit code

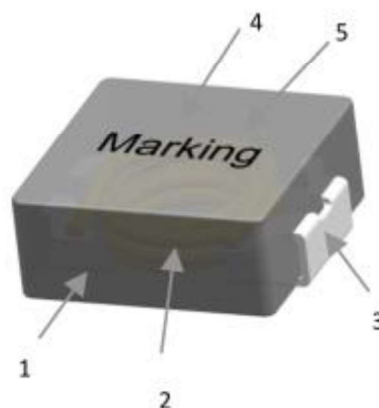
Nominal Inductance	
Example	Nominal Value
1R0	1.0 μH
100	10 μH
101	100 μH



Note : Using Ink for marking

## ■ Structure and Components

Symbol	Components	Material
1	CORE	Carbonyl Powder
2	WIRE	Polyester Wire or equivalent.
3	Clip	100% Pb free solder (Ni+Sn---Plating)
4	paint	Epoxy resin
5	Ink	Halogen-free ketone





## Power Inductor EBP0530P-TWA Product Specifications

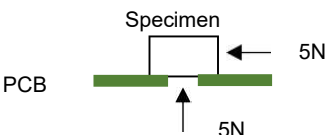
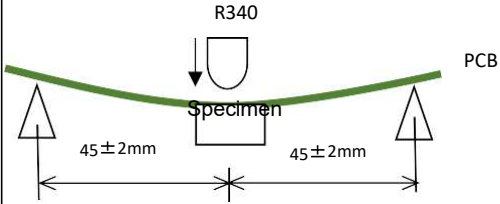
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### ● Reliability test and requirement

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°C ± 5°C , 60s ± 2s 2. Tin: lead-free. 3. Temperature: 240°C ± 5°C , flux 3.0s ± 0.5s.
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: 10HZ ~ 55HZ ~ 10HZ, 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 ± 10% Without distinct damage in appearance	1. First -55°C for 30 minutes, last 125°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 ± 2 hours
Humidity Resistance	Inductance change: Within ± 10% Without distinct damage in appearance	1. Reflow 2 times, 2. 85°C, 85%RH, 1000 hours 3. Measured at room temperature after placing for 24 ± 2 hours
Low temperature storage	Inductance change: Within ± 10% Without distinct damage in appearance	1. Temperature: -55 ± 2°C 2. Time: 1000 hours 3. Measured at room temperature after placing for 24 ± 2 hours
High temperature storage	Inductance change: Within ± 10% Without distinct damage in appearance	1. Temperature: +125 ± 2°C 2. Time: 1000 hours 3. Measured at room temperature after placing for 24 ± 2 hours

Test Item	Test condition	Specification
Adhesive Test	<ul style="list-style-type: none"> <li>Test time: <math>10 \pm 1</math> sec.</li> <li>Measure after removing pressure.</li> </ul> 	<ul style="list-style-type: none"> <li>L change Rate : Within <math>\pm 10\%</math> (Change from an initial value)</li> <li>No abnormal appearance after the test.</li> </ul>
Bending test	<ul style="list-style-type: none"> <li>Bent depth : 2mm</li> <li>PCB size: <math>40 \times 100</math> mm</li> <li>PCB thickness: 1.0mm</li> <li>Test time: 30sec.</li> </ul> 	<ul style="list-style-type: none"> <li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li> <li>No abnormal appearance after the test.</li> </ul>
Vibration test	<ul style="list-style-type: none"> <li>Sweep frequency : 10~55Hz (10Hz to 55Hz to 10Hz in a period of one minute)</li> <li>Amplitud : 1.5mm</li> <li>2Hr in each of 3(X, Y, Z) axes.</li> </ul>	<ul style="list-style-type: none"> <li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li> <li>No abnormal appearance after the test.</li> </ul>
Mechanical shock test	<ul style="list-style-type: none"> <li>Peak acceleration : <math>1962 \text{ m/s}^2</math></li> <li>Duration of pulse : 6ms</li> <li>3 times in each of 3(X, Y, Z) axes.</li> </ul>	<ul style="list-style-type: none"> <li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li> <li>No abnormal appearance after the test.</li> </ul>
Drop test	<p>The specimen must be fixed on PCB. It must be equipped with instruments of which weight is 500g. Then it shall be fallen freely from 100cm height to rigid wood 3 times in each of three axes.</p>	<ul style="list-style-type: none"> <li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li> <li>No abnormal appearance after the test.</li> </ul>
Resistance to Solder Heat	<ul style="list-style-type: none"> <li>Reflow soldering method</li> <li>Pre heat : <math>150 \sim 180^\circ\text{C}</math> <math>90 \pm 30</math> sec.</li> <li>Peak temp. : <math>255(+5/-0)^\circ\text{C}</math> (<math>230^\circ\text{C}</math> min., <math>30 \pm 10</math> sec.)</li> <li>PCB thickness: 1.0mm</li> <li>Test Cycles : 2times</li> </ul>	<ul style="list-style-type: none"> <li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li> <li>No abnormal appearance after the test.</li> </ul>
Solder ability	<ul style="list-style-type: none"> <li>Electrode shall be immersed in flux at room temperature and then shall be immersed in solder bath after preheat.</li> <li>Solder temp: <math>245 \pm 5^\circ\text{C}</math> ,</li> <li>Dip time : <math>3 \pm 0.5</math> sec.</li> </ul>	<ul style="list-style-type: none"> <li>New solder shall cover 90% minimum of the surface immersed.</li> </ul>
Temperature drift	<ul style="list-style-type: none"> <li>To be measured in the range of <math>-40^\circ\text{C}</math> to <math>125^\circ\text{C}</math></li> </ul>	<ul style="list-style-type: none"> <li>Inductance temperature coefficient : <math>1000 \text{ ppm}/^\circ\text{C}</math> or less.</li> </ul>



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Test Item	Test condition	Specification															
Low temperature test	<ul style="list-style-type: none"><li>Temp.: <math>-40\pm 3^{\circ}\text{C}</math></li><li>Test times : <math>500\pm 12\text{Hr}</math></li></ul>	<ul style="list-style-type: none"><li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li><li>No abnormal appearance after the test.</li></ul>															
Dry heat test	<ul style="list-style-type: none"><li>Temp.: <math>+85\pm 2^{\circ}\text{C}</math></li><li>Test times : <math>500\pm 12\text{Hr}</math></li></ul>	<ul style="list-style-type: none"><li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li><li>No abnormal appearance after the test.</li></ul>															
Humidity test	<ul style="list-style-type: none"><li>Temp.: <math>+40\pm 2^{\circ}\text{C}</math></li><li>Humidity : <math>90\sim 95\%\text{RH}</math></li><li>Test times : <math>500\pm 12\text{Hr}</math></li></ul>	<ul style="list-style-type: none"><li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li><li>No abnormal appearance after the test.</li></ul>															
Thermal shock test	<ul style="list-style-type: none"><li>Condition of 1 cycle</li></ul> <table border="1"><thead><tr><th>Step</th><th>Temp. (<math>^{\circ}\text{C}</math>)</th><th>Dwell time (min.)</th></tr></thead><tbody><tr><td>1</td><td><math>-40\pm 3</math></td><td><math>30\pm 3</math></td></tr><tr><td>2</td><td>Room temp.</td><td>Within 3</td></tr><tr><td>3</td><td><math>+125\pm 2</math></td><td><math>30\pm 3</math></td></tr><tr><td>4</td><td>Room temp.</td><td>Within 3</td></tr></tbody></table> <ul style="list-style-type: none"><li>Test Cycles : <math>100\pm 12\text{cycle}</math></li></ul>	Step	Temp. ( $^{\circ}\text{C}$ )	Dwell time (min.)	1	$-40\pm 3$	$30\pm 3$	2	Room temp.	Within 3	3	$+125\pm 2$	$30\pm 3$	4	Room temp.	Within 3	<ul style="list-style-type: none"><li>L change Rate : within <math>\pm 10\%</math> (Change from an initial value)</li><li>No abnormal appearance after the test.</li></ul>
Step	Temp. ( $^{\circ}\text{C}$ )	Dwell time (min.)															
1	$-40\pm 3$	$30\pm 3$															
2	Room temp.	Within 3															
3	$+125\pm 2$	$30\pm 3$															
4	Room temp.	Within 3															

## ● Temperature Range

· Operating Temperature range:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

※ Operating temperature range includes self-temperature rise.

※ The part temperature (ambient + temp rise) should not exceed  $125^{\circ}\text{C}$  under worst case operating conditions.

Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

· Taping Package Storage Temperature range:  $+5^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$



## Power Inductor EBP0530P-TWA Product Specifications

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### ● Reminders

- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- Do not exceed the rated current
  - ※ If it is used exceeding the rated current, insulation resistance may decrease and excessive heat generation may occur.
  - ※ In case of any abnormality or malfunction of our products, be sure to add the appropriate Fail safe function to the finished product to prevent secondary disasters.
- The storage period is less than 6 months. Be sure to follow the storage conditions (temperature: 5 to 40°C, humidity: 20 to 75% RH or less).
  - ※ If the storage period elapses, the soldering of the terminal electrodes may deteriorate
  - ※ Avoid storage in places subject to direct sunlight, vibration, etc
  - ※ Do not use or store in an environment (chlorine gas, acid, alkali, sulfide gas, etc.) that is affected by gas corrosion.
- Please do not give excessive vibration and impact.
- Do not design Through hole or Pattern under Coil.
- Please arrange so that Coil does not touch each other.
- When incorporating the circuit board into the SET, be sure not to apply stress to the Coil due to distortion of the board due to Screw fastening part or the like.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Soldering correction method
  - Pre Heat : 150°C 2min.
  - Soldering tip temperature: 350 ° C or less
  - Correction work time: within 3 seconds
  - Soldering tip power: 80 W or less
  - Soldering tip diameter:  $\Phi$  3 mm or less
- Use a wrist band to discharge static electricity in your body through the grounding wire.
- Do not expose the products to magnets or magnetic fields.
- For resin Coating, pay attention to resin selection and perform reliability evaluation in the mounted state.



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## Recommended Soldering Technologies:

### (1) Re-flowing Profile

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

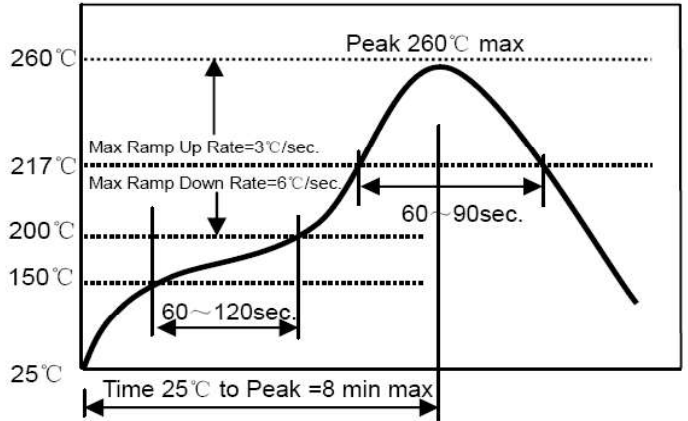
Allowed time above 217°C: 60~90sec.

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

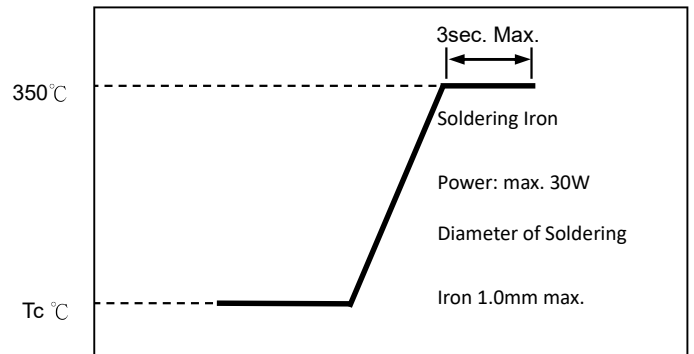
Pre-heating: 150°C/60sec.

Soldering Tip temperature: 350°C Max.

Soldering time: 3sec. Max.

Solder paste: Sn/3.0Ag/0.5Cu

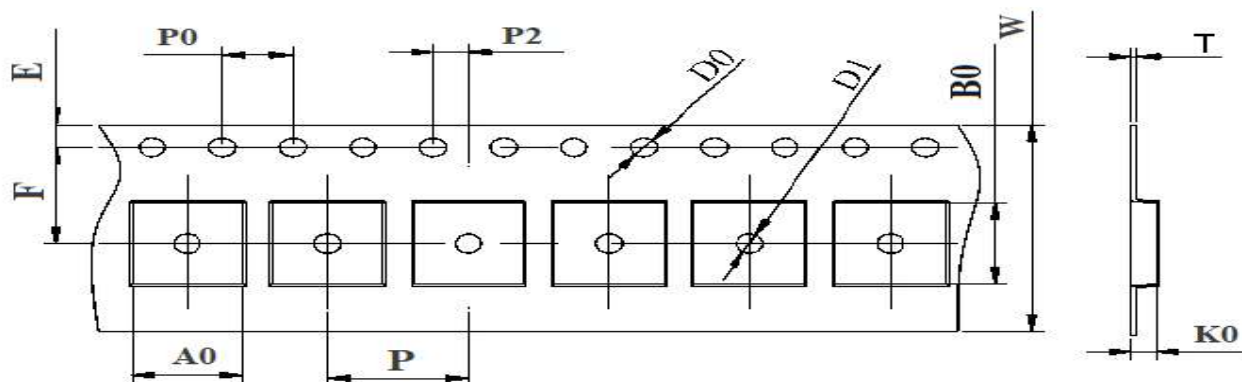
Max.1 times for iron soldering





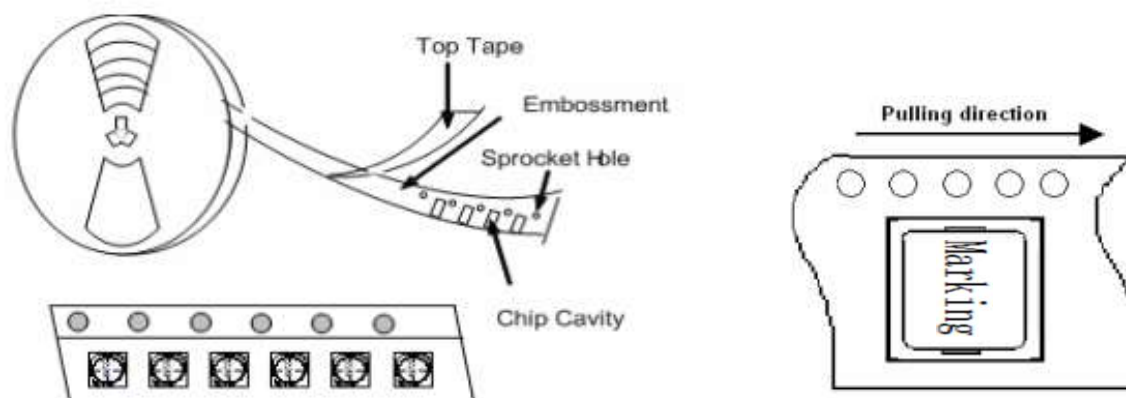
## ■ Packaging Information

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



Type	Tape dimensions (mm)											
	W	P	P0	P2	D0	D1	T	A0	B0	K0	E	F
EBP0530P-TWA	12 ±0.3	8 ±0.1	4 ±0.1	2 ±0.1	1.5 ±0.1	1.5 ±0.1	0.35 ±0.05	5.5 ±0.1	5.9 ±0.1	3.3 ±0.1	1.75 ±0.1	5.5 ±0.1

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

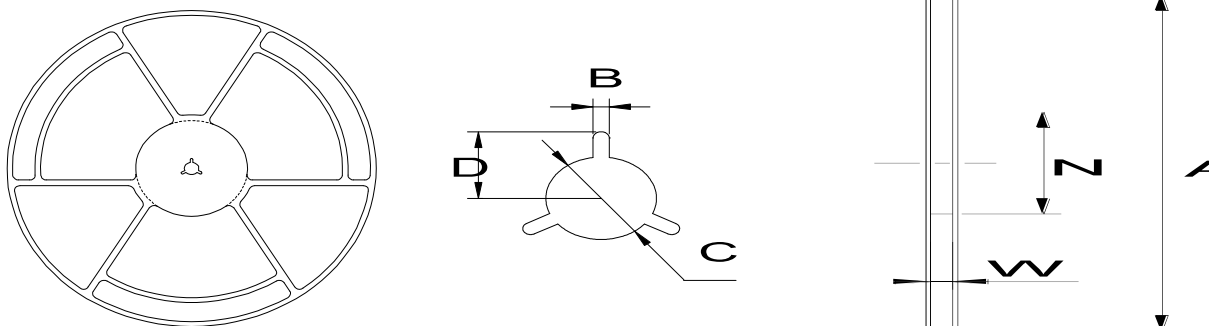




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**(3) Reel Dimensions (Unit : mm)**



Type	A	W	N	B	C	D
EBP0530P-TWA	330±2.0	12.8±0.2	97±0.5	2.2±0.5	13.2±0.2	10.75±0.25

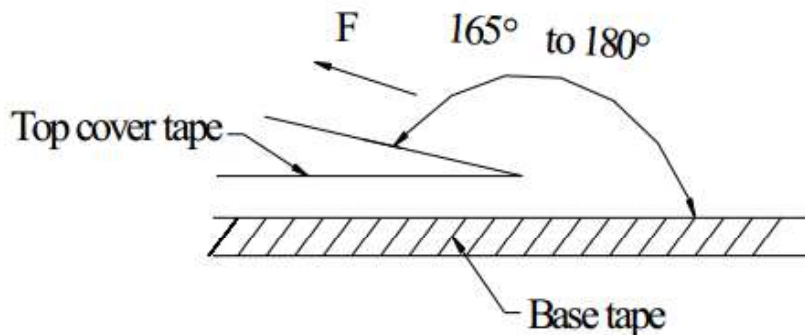
**(4) Packaging Quantity (PCS)**

Type	Standard Quantity		
	Reel	Inner box	Carton box
EBP0530P-TWA	2000 pcs / reel	4Reel / box (8000 pcs)	4Middle boxes, (32,000 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



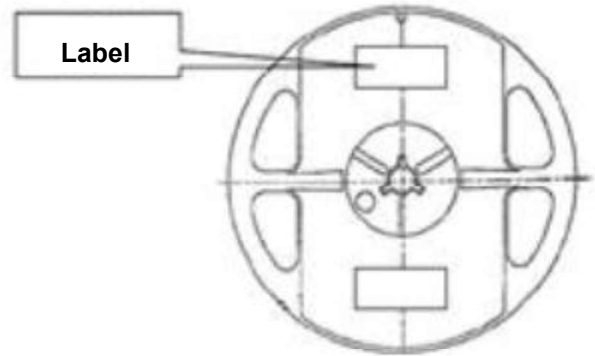


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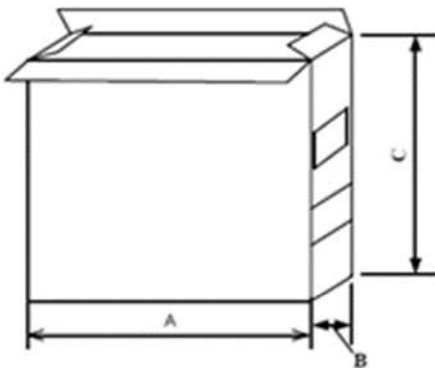
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**(6) Reel Label**

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

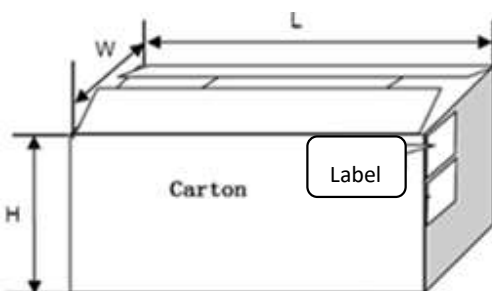


**(7) Inner Box**



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