

# Power Inductor

## BPDC Series



### Overview

Power inductors are passive electronic components used in various circuits to store energy in a magnetic field when electrical current flows through them. They are critical in filtering, energy storage, and noise suppression in power electronic systems. They are designed to handle higher currents and are optimized for minimal power loss and thermal efficiency.

### Benefits

1. Ferrite SMD Shielded Type
2. Various package size and wide inductance range

### Applications

1. AP Routers, STBs
2. LCD TVs and monitors
3. Game consoles
4. LED lightings
5. DC/DC converters

### Product Information

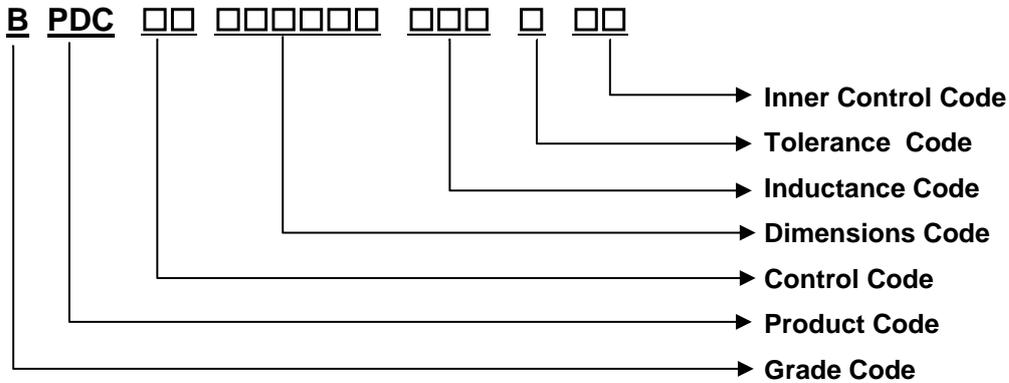
| Series | L (mm) | W(mm) | T (mm) | Inductance (μH) |
|--------|--------|-------|--------|-----------------|
| BPDC   | 5.1    | 5.1   | 2.0    | 1.1 ~ 100       |
|        | 5.1    | 5.1   | 3.0    |                 |



## BPDC00050530 Series Specification

**1 Scope:** This specification applies to the Pb Free high current type SMD inductors

**2 Part Numbering:**



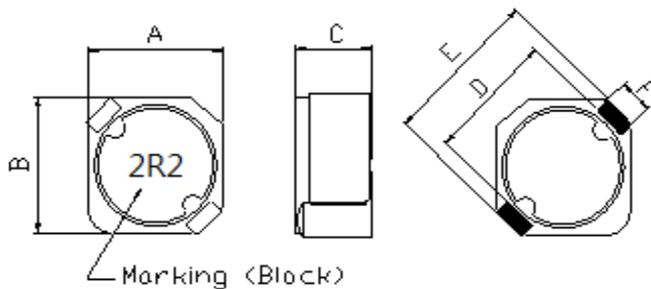
**3 Rating:**

Operating Temperature range: -40°C ~ +125°C (Including self temp. rise)  
 Storage Temperature: (on tape & reel): -20°C to +40°C; 75% RH max.

**4 Standard Testing Condition**

|             | Unless otherwise specified       | In case of doubt |
|-------------|----------------------------------|------------------|
| Temperature | Ordinary Temperature(15 to 35°C) | 20 to 30°C       |
| Humidity    | Ordinary Humidity(25 to 85% RH)  | 50 to 80 %RH     |

**5 Configuration and Dimensions:**



|              |    |
|--------------|----|
| A: 5.10 Max. | mm |
| B: 5.10 Max. | mm |
| C: 3.00 Max. | mm |
| D: 4.40 Typ. | mm |
| E: 6.20 Max. | mm |
| F: 1.40 Typ. | mm |

Net Weight (grms)

| SIZE CODE | Net Weight (grms) |
|-----------|-------------------|
| 050530    | 0.23 (Typ.)       |

## BPDC00050530 Series Specification

### 6 Electrical Characteristics:

| Part No.           | Inductance L( $\mu$ H) | Test Freq.   | Resistance RDC( $\Omega$ ) Max. | Rated DC Current Isat(A) | Irms(A) | Tolerance | Marking |
|--------------------|------------------------|--------------|---------------------------------|--------------------------|---------|-----------|---------|
| BPDC000505301R1□00 | 1.1                    | 100kHz/0.25V | 22m                             | 3.80                     | 3.80    | T         | 1R1     |
| BPDC000505302R0□00 | 2.0                    | 100kHz/0.25V | 29m                             | 2.60                     | 2.60    | M,T       | 2R0     |
| BPDC000505303R2□00 | 3.2                    | 100kHz/0.25V | 42m                             | 2.30                     | 2.30    | T         | 3R2     |
| BPDC000505304R7□00 | 4.7                    | 100kHz/0.25V | 63m                             | 1.80                     | 1.80    | M,T       | 4R7     |
| BPDC000505306R3□00 | 6.3                    | 100kHz/0.25V | 94m                             | 1.30                     | 1.30    | T         | 6R3     |
| BPDC00050530100□00 | 10                     | 100kHz/0.25V | 0.106                           | 1.26                     | 1.26    | M,T       | 100     |
| BPDC00050530150□00 | 15                     | 100kHz/0.25V | 0.137                           | 1.05                     | 1.05    | M,T       | 150     |
| BPDC00050530220□00 | 22                     | 100kHz/0.25V | 0.207                           | 0.85                     | 0.85    | M,T       | 220     |
| BPDC00050530330□00 | 33                     | 100kHz/0.25V | 0.331                           | 0.70                     | 0.70    | M,T       | 330     |
| BPDC00050530470□00 | 47                     | 100kHz/0.25V | 0.510                           | 0.54                     | 0.54    | M,T       | 470     |
| BPDC00050530680□00 | 68                     | 100kHz/0.25V | 0.625                           | 0.49                     | 0.49    | M,T       | 680     |
| BPDC00050530101□00 | 100                    | 100kHz/0.25V | 0.948                           | 0.40                     | 0.40    | M,T       | 101     |

**NOTE: tolerance M=±20% , T=±30%**

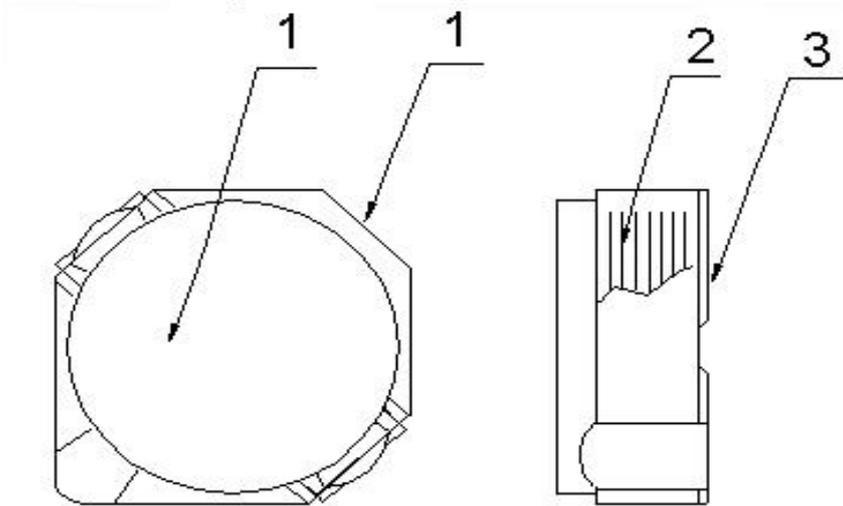
1.Isat : Based on inductance change ( $\Delta$ L/Lo : drop 35% Max.) @ambient Temperature : 25°C

2.Irms : Based on temperature rise ( $\Delta$ T : 40°C Typ.)

3.Rated DC Current : The less value which is Isat or Irms.

**BPDC00050530 Series Specification**

**6.1 Construction:**



**6.2 Material List:**

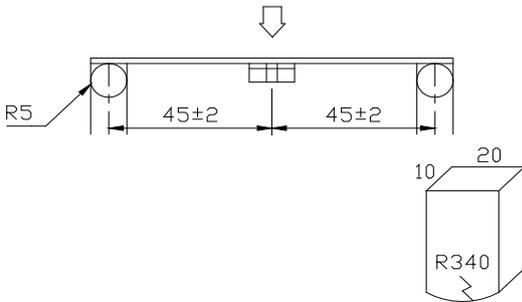
| NO. | ITEM     | DESCRIPTION & TYPE |
|-----|----------|--------------------|
| 1   | Core     | Ferrite            |
| 2   | Wire     | Magnet Wire        |
| 3   | Terminal | Terminal Copper    |

## BPDC00050530 Series Specification

### ELECTRICAL

| TEST ITEM                    | SPECIFICATION  | TEST DETAILS   |
|------------------------------|--|--|
| Insulation resistance        | There shall be no other damage or problems.  | DC 100V voltage shall be applied across this sample of top surface and the terminal.<br>The insulation resistance shall be more than $1 \times 10^8 \Omega$ .  |
| Dielectric withstand voltage | There shall be no other damage or problems.  | AC 100V voltage shall be applied for 1 minute across the top surface and the terminal of this sample   |
| Temperature characteristics  | $\Delta L/L20^\circ\text{C} \leq \pm 10\%$<br>$0 \sim 2000 \text{ ppm}/^\circ\text{C}$ | The test shall be performed after the sample has stabilized in an ambient temperature of $-20$ to $+85^\circ\text{C}$ , and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L/L20^\circ\text{C} \leq \pm 10\%$ . |

### MECHANICAL

| TEST ITEM         | SPECIFICATION   | TEST DETAILS   |
|-------------------|---|--|
| Substrate bending | $\Delta L/L_0 \leq \pm 10\%$<br><br>There shall be no mechanical damage or electrical damage. | The sample shall be soldered onto the printed circuit board in figure 1 and a load applied until the figure in the arrow direction is made approximately 3mm. (keep time 30 seconds)<br>PCB dimension shall be the page 7/9<br><br>F(Pressurization)<br><br><br>PRESSURE ROD<br>figure-1 |

**BPDC00050530 Series Specification**

**MECHANICAL**

| TEST ITEM                                       | SPECIFICATION  |  |
|---|--|--|
| Vibration                                       | $\Delta L/L_0 \leq \pm 10\%$<br><br>There shall be no mechanical damage. | The sample shall be soldered onto the printed circuit board and when a vibration having an amplitude of 1.52mm and a frequency of from 10 to 55Hz/1 minute repeated should be applied to the 3 directions (X,Y,Z) for 2 hours each. (A total of 6 hours)   |
| Solderability                                   | New solder<br>More than 90%  | Flux (rosin, isopropyl alcohol{JIS-K-1522}) shall be coated over the whole of the sample before hard, the sample shall then be preheated for about 2 minutes in a temperature of 130~150°C and after it has been immersed to a depth 0.5mm below for 3±0.2 seconds fully in molten solder M705 with a temperature of 245±5°C.<br><br>More than 90% of the electrode sections shall be covered with new solder smoothly when the sample is taken out of the solder bath.  |
| Resistance to Soldering heat (reflow soldering) | There shall be no damage or problems.                                    | <p style="text-align: center;"><b>Temperature profile of reflow soldering</b></p> <p style="text-align: center;">                         Ramp up: 3°C/sec. max.      Ramp down: 6°C/sec. max.                     </p> <p style="text-align: center;">                         Soldering: 260°C ± 3°C, 10 - 30 sec.                     </p> <p style="text-align: center;">                         Preheat: 150-200°C, 60-120 sec.      Liquidus: &gt;217°C, 60-150 sec.                     </p> <p>The specimen shall be passed through the reflow oven with the condition shown in the above profile for 1 time.<br/>                     The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.</p> |

## BPDC00050530 Series Specification

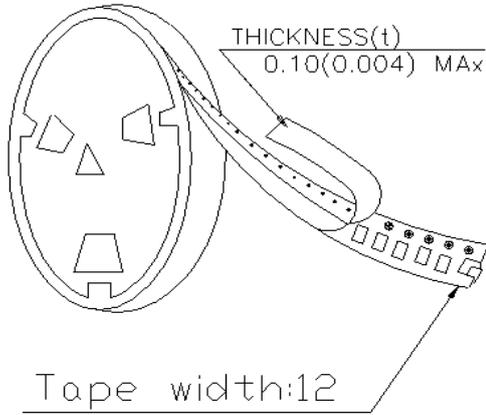
### ENVIRONMENT CHARACTERISTICS

| TEST ITEM   | SPECIFICATION   |   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
|---|---|---|--|-------------|----------|---|--|---------|---|----------------------|-----------|---|--|---------|---|----------------------|-----------|
| High temperature storage  | $\Delta L/Lo \leq \pm 10\%$<br><br>There shall be no mechanical damage.       | The sample shall be left for $96 \pm 4$ hours in an atmosphere with a temperature of $125^\circ\text{C}$ and a normal humidity.<br><br>Upon completion of the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour.  |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| Low temperature storage   | $\Delta L/Lo \leq \pm 10\%$<br><br>There shall be no mechanical damage.       | The sample shall be left for $96 \pm 4$ hours in an atmosphere with a temperature of $-40 \pm 2^\circ\text{C}$ .<br><br>Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour.   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| Change of temperature   | $\Delta L/Lo \leq \pm 10\%$<br><br>There shall be no other damage of problems | The sample shall be subject to 5 continuous cycles, such as shown in the table 2 below and then it shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made. <div style="text-align: center; margin-top: 10px;"> <p>table 2</p> <table border="1"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-40 \pm 2^\circ\text{C}</math><br/>(Thermostat No.1)</td> <td>30 min.</td> </tr> <tr> <td>2</td> <td>Standard atmospheric</td> <td>No.1→No.2</td> </tr> <tr> <td>3</td> <td><math>125^\circ\text{C}</math><br/>(Thermostat No.2)</td> <td>30 min.</td> </tr> <tr> <td>4</td> <td>Standard atmospheric</td> <td>No.2→No.1</td> </tr> </tbody> </table> </div> |  | Temperature | Duration | 1 | $-40 \pm 2^\circ\text{C}$<br>(Thermostat No.1) | 30 min. | 2 | Standard atmospheric | No.1→No.2 | 3 | $125^\circ\text{C}$<br>(Thermostat No.2) | 30 min. | 4 | Standard atmospheric | No.2→No.1 |
|   | Temperature   | Duration  |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| 1   | $-40 \pm 2^\circ\text{C}$<br>(Thermostat No.1)                                | 30 min.   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| 2   | Standard atmospheric  | No.1→No.2   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| 3   | $125^\circ\text{C}$<br>(Thermostat No.2)                                      | 30 min.   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| 4   | Standard atmospheric  | No.2→No.1   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| Moisture storage  | $\Delta L/Lo \leq \pm 10\%$<br><br>There shall be no mechanical damage.       | The sample shall be left for $96 \pm 4$ hours in a temperature of $40 \pm 2^\circ\text{C}$ and a humidity(RH) of $90 \sim 95\%$ .<br><br>Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity more than 1 hour.  |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |
| <b>Test conditions :</b><br><br>The sample shall be reflow soldered onto the printed circuit board in every test. |   |   |  |             |          |   |  |         |   |                      |           |   |  |         |   |                      |           |

**BPDC00050530 Series Specification**

**7 Packaging:**

**7.1 Packaging -Cover Tape**

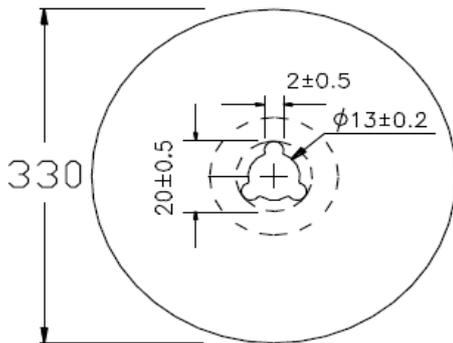


**7.2 Packaging Quantity**

| TYPE         | PCS/REEL |
|--------------|----------|
| BPDC00050530 | 2000     |

**7.3 Reel Dimensions**

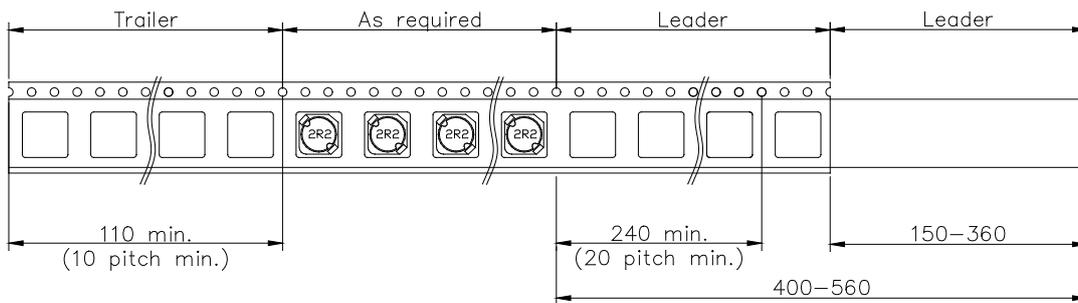
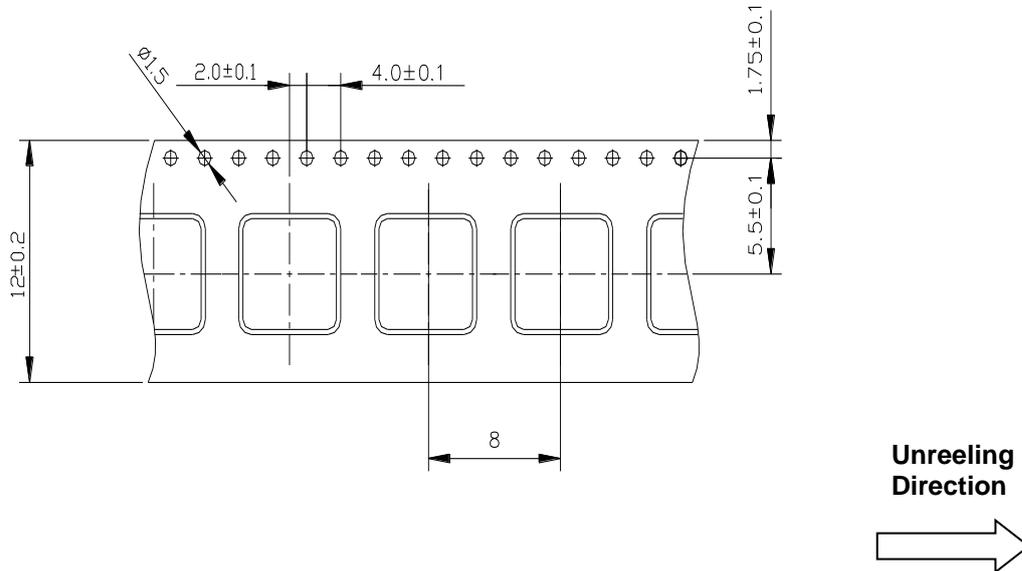
Unit : mm



## BPDC00050530 Series Specification

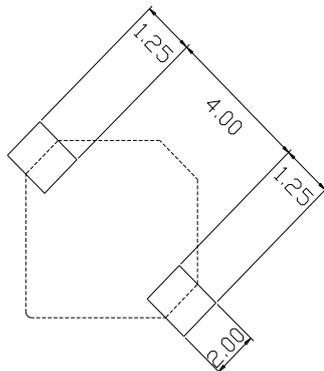
### 7 Packaging:

#### 7.4 Tape Dimensions in mm



### 8 Recommended Land Pattern:

(STANDARD PATTERN) Unit : mm



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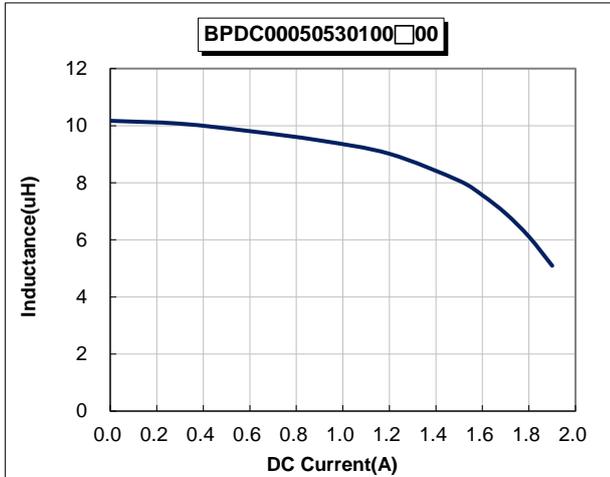
### 9 Note:

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Do not knock or drop.
3. All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
4. Please keep the distance between transformer/coil and other components (refer to the standard IEC 950)
5. The moisture sensitivity level (MSL) of products is classified as level 1.

## BPDC00050530 Series Specification

### TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT  
@100kHz/0.25V



TEMPERATURE vs. DC CURRENT

