

BPXX 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. Low Rdc and high saturation current for portable DC to DC converter line
- 2. High magnetic shielding construction provides high resolution for EMC protection
- 3. Support lead-free soldering

Applications

- 1. Notebook PC
- 2. Set top box, SSD
- 3. LCD TV, LCD displays
- 4. Portable communication device
- 5. DC/DC converters
- 6. Networking

Product Information

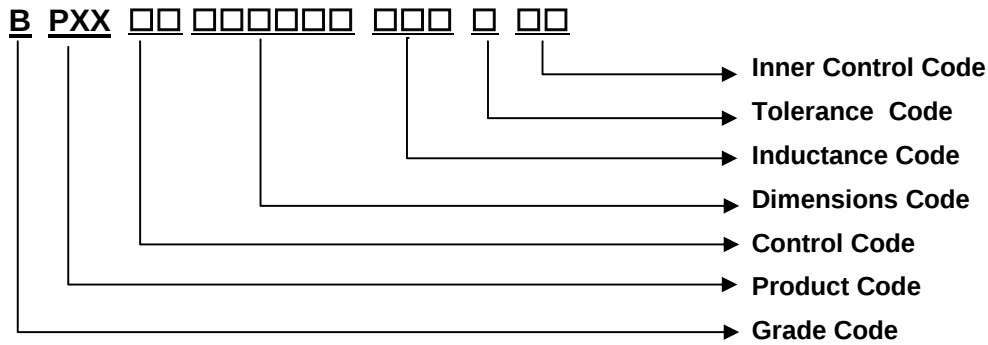
| Series | L (mm) | W(mm) | T (mm) | Inductance (μH) |
|--------|--------|-------|--------|-----------------|
| BPXX   | 3.0    | 3.0   | 1.0    | 0.3 ~ 10000     |
|        | 3.0    | 3.0   | 1.2    |                 |
|        | 3.0    | 3.0   | 1.5    |                 |
|        | 3.0    | 3.0   | 2.0    |                 |
|        | 4.0    | 4.0   | 1.2    |                 |
|        | 4.0    | 4.0   | 1.8    |                 |
|        | 4.0    | 4.0   | 2.0    |                 |
|        | 4.0    | 4.0   | 3.0    |                 |
|        | 5.0    | 5.0   | 1.5    |                 |
|        | 5.0    | 5.0   | 2.0    |                 |
|        | 5.0    | 5.0   | 3.0    |                 |
|        | 6.0    | 6.0   | 2.0    |                 |
|        | 6.0    | 6.0   | 2.5    |                 |
|        | 6.0    | 6.0   | 3.0    |                 |
|        | 6.0    | 6.0   | 3.5    |                 |



## BPXX00030320 Series Specification

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

**2 Part Numbering:**



**3 Rating:**

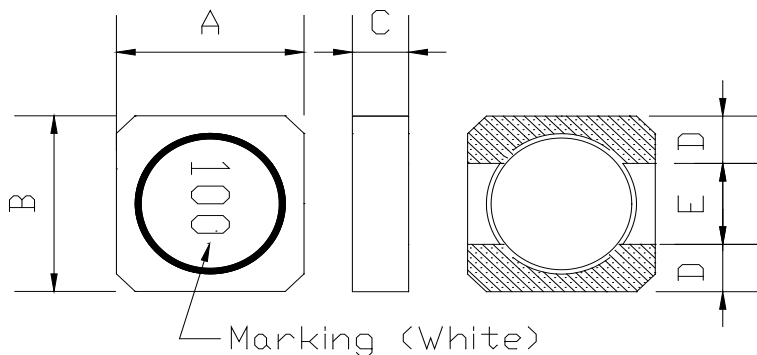
Operating Temperature:  $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$  (Including self - temperature rise)

Storage Temperature: (on tape & reel):  $-20^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ ; 75% RH max.

**4 Standard Testing Condition:**

|             | Unless otherwise specified                        | In case of doubt           |
|-------------|---------------------------------------------------|----------------------------|
| Temperature | Ordinary Temperature(15 to $35^{\circ}\text{C}$ ) | 20 to $30^{\circ}\text{C}$ |
| Humidity    | Ordinary Humidity(25 to 85% RH)                   | 50 to 80 %RH               |

**5 Configuration and Dimensions and Unit Weight:**



|                   |    |
|-------------------|----|
| A: $3.00 \pm 0.2$ | mm |
| B: $3.00 \pm 0.2$ | mm |
| C: 2.0 Max.       | mm |
| D: 0.9 Typ.       | mm |
| E: 1.2 Typ.       | mm |

Net Weight (grms)

| SIZE CODE | Net Weight (grms) |
|-----------|-------------------|
| 030320    | 0.070(Typ.)       |

## BPXX00030320 Series Specification

### 6 Electrical Characteristics:

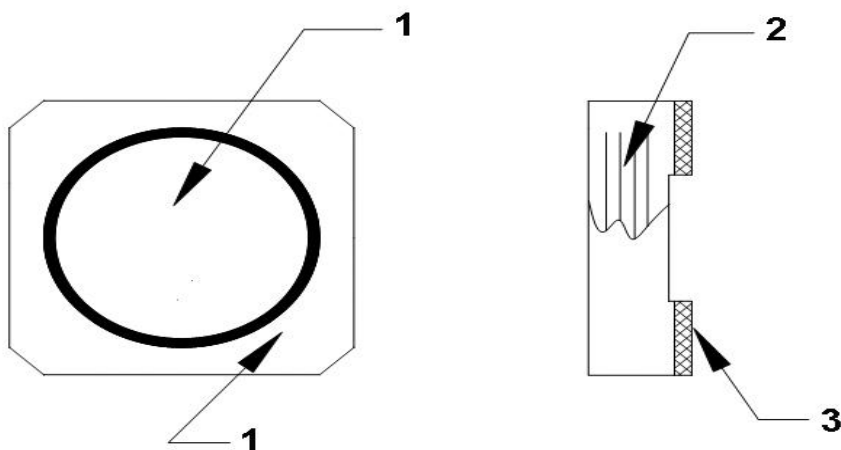
| Part No.           | Inductance<br>L(μH) | Test<br>Frequency | Resistance<br>RDC(Ω) Max. | Rated DC Current |         | Tolerance | Marking |
|--------------------|---------------------|-------------------|---------------------------|------------------|---------|-----------|---------|
|                    |                     |                   |                           | Isat(A)          | Irms(A) |           |         |
| BPXX000303201R0□00 | 1.0                 | 100kHz/0.1V       | 40m                       | 2.80             | 2.50    | M,T       | 1R0     |
| BPXX000303202R2□00 | 2.2                 | 100kHz/0.1V       | 80m                       | 2.00             | 1.80    | M,T       | 2R2     |
| BPXX000303203R3□00 | 3.3                 | 100kHz/0.1V       | 0.10                      | 1.80             | 1.60    | M,T       | 3R3     |
| BPXX000303204R7□00 | 4.7                 | 100kHz/0.1V       | 0.14                      | 1.60             | 1.40    | M,T       | 4R7     |
| BPXX000303206R8□00 | 6.8                 | 100kHz/0.1V       | 0.17                      | 1.40             | 1.20    | M,T       | 6R8     |
| BPXX00030320100□00 | 10                  | 100kHz/0.1V       | 0.40                      | 1.00             | 0.80    | M,T       | 100     |
| BPXX00030320220□00 | 22                  | 100kHz/0.1V       | 0.60                      | 0.70             | 0.65    | M,T       | 220     |
| BPXX00030320330□00 | 33                  | 100kHz/0.1V       | 1.00                      | 0.60             | 0.52    | M,T       | 330     |
| BPXX00030320470□00 | 47                  | 100kHz/0.1V       | 1.35                      | 0.50             | 0.50    | M,T       | 470     |

**NOTE: tolerance M=±20%, T=±30%**

1. Isat : Based on inductance change ( $\Delta L/L_0$  : drop 30% Max.) @ambient temperature 25°C
2. Irms : Based on temperature rise ( $\Delta T$  : 40°C Typ.)

## BPXX00030320 Series Specification

### 6.1 Construction:



### 6.2 Material List:

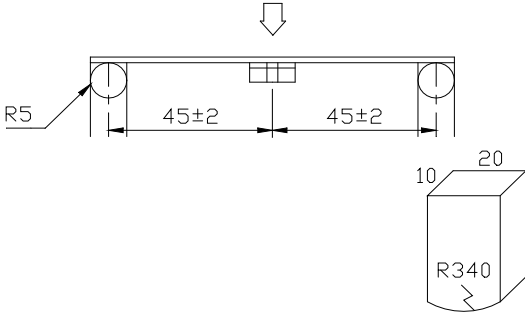
| NO. | ITEM     | DESCRIPTION & TYPE |
|-----|----------|--------------------|
| 1   | CORE     | FERRITE            |
| 2   | WIRE     | MAGNET WIRE (P180) |
| 3   | TERMINAL | Ag/Cu/Ni/Sn        |

## BPXX00030320 Series Specification

### ELECTRICAL

| TEST ITEM                   | SPECIFICATION                                                                              | TEST DETAILS                                                                                                                                                                                                                                                                         |
|-----------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. | <p>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)</p> <p>PCB dimension shall the page 7/9</p> <p><b>F(Pressurization)</b></p>  <p><b>PRESSURE ROD</b><br/>figure-1</p> |

## BPXX00030320 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>The graph shows a temperature profile for reflow soldering. The y-axis is Temperature (°C) with markers at 25, 160, 217, and 260. The x-axis is Time. The profile starts at 25°C, rises through a preheat phase (150-200°C, 60-120 sec), enters a liquidus phase (&gt;217°C, 60-150 sec), reaches a peak soldering temperature of 260°C ± 3°C for 10-30 seconds, and then ramps down at 6°C/sec max. The ramp up is at 3°C/sec max.</p> <p>The specimen shall be passed through the reflow oven with the condition shown in the above profile for 1 time.</p> <p>The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.</p> |

## BPXX00030320 Series Specification

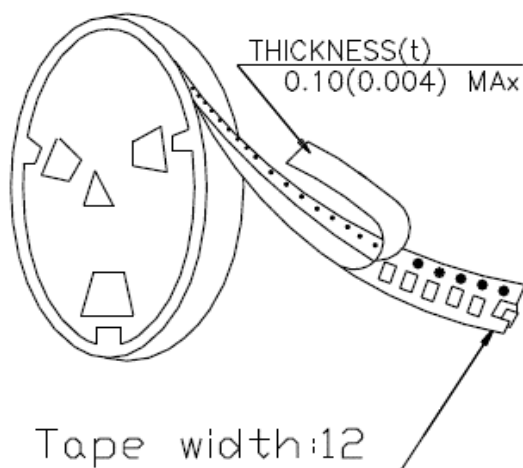
### ENVIRONMENT CHARACTERISTICS

| 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 $-40 \pm 3^\circ\text{C}$ .<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.<br><br><div style="text-align: center;">table 2</div> <table border="1"> <thead> <tr> <th></th><th>Temperature</th><th>Duration</th></tr> </thead> <tbody> <tr> <td>1</td><td><math>-40 \pm 3^\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 \pm 2^\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> |  | Temperature | Duration | 1 | $-40 \pm 3^\circ\text{C}$<br>(Thermostat No.1) | 30 min. | 2 | Standard atmospheric | No.1→No.2 | 3 | $125 \pm 2^\circ\text{C}$<br>(Thermostat No.2) | 30 min. | 4 | Standard atmospheric | No.2→No.1 |
|                                                                                                                   | Temperature                                                                   | Duration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |             |          |   |                                                |         |   |                      |           |   |                                                |         |   |                      |           |
| 1                                                                                                                 | $-40 \pm 3^\circ\text{C}$<br>(Thermostat No.1)                                | 30 min.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |             |          |   |                                                |         |   |                      |           |   |                                                |         |   |                      |           |
| 2                                                                                                                 | Standard atmospheric                                                          | No.1→No.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |             |          |   |                                                |         |   |                      |           |   |                                                |         |   |                      |           |
| 3                                                                                                                 | $125 \pm 2^\circ\text{C}$<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 90~95%.<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. |                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |             |          |   |                                                |         |   |                      |           |   |                                                |         |   |                      |           |

## BPXX00030320 Series Specification

### 7 Packaging:

#### 7.1 Packaging -Cover Tape

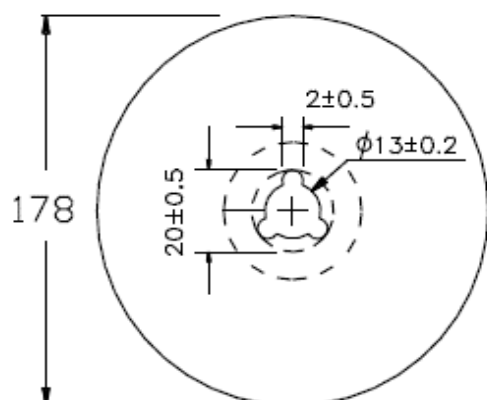


#### 7.2 Packaging Quantity

| TYPE         | PCS/REEL |
|--------------|----------|
| BPXX00030320 | 1000     |

#### 7.3 Reel Dimensions

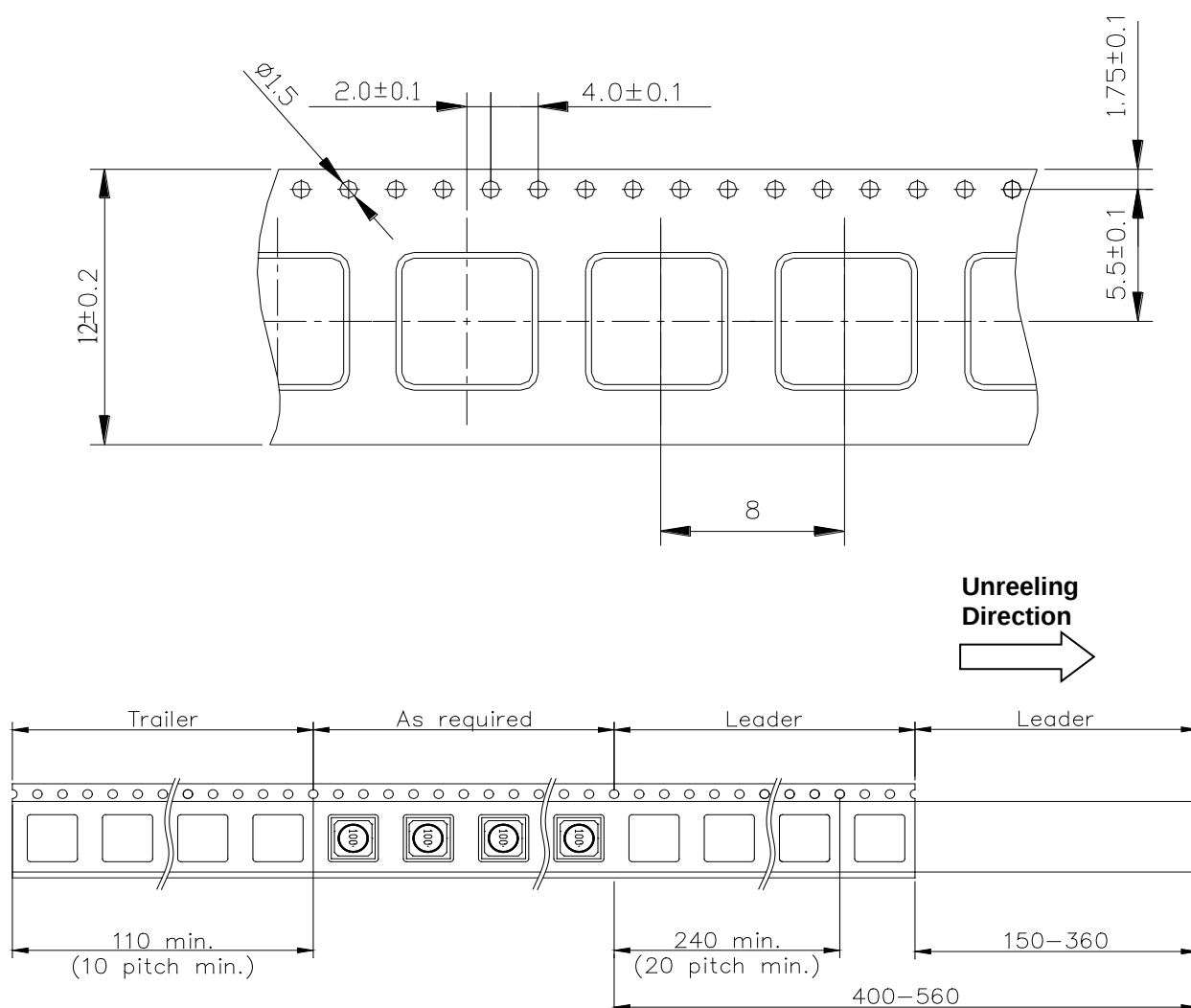
Unit : mm



## BPXX00030320 Series Specification

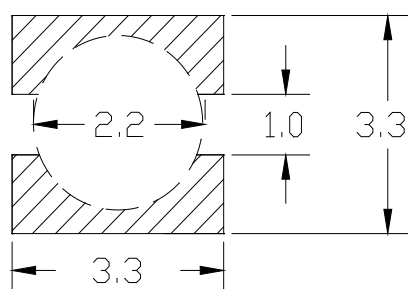
### 7 Packaging:

#### 7.4 Tape Dimensions in mm



### 8 Recommended Land Pattern:

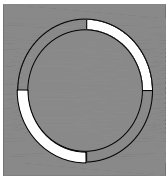
(STANDARD PATTERN) Unit : mm



## BPXX00030320 Series Specification

### 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.
6. Void Appearance Tolerance Limit



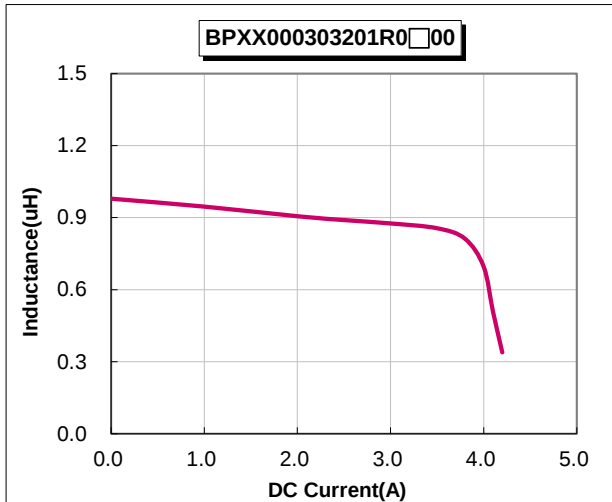
6-1. The length of the hole in the epoxy of the sealed glue position should be less than  $\frac{1}{2}$  of the DR core's circumference, otherwise, it is NG.

6-2. The total length of the amount of hole in the epoxy should be less than  $\frac{1}{2}$  of the DR core's circumference, otherwise, it is NG.

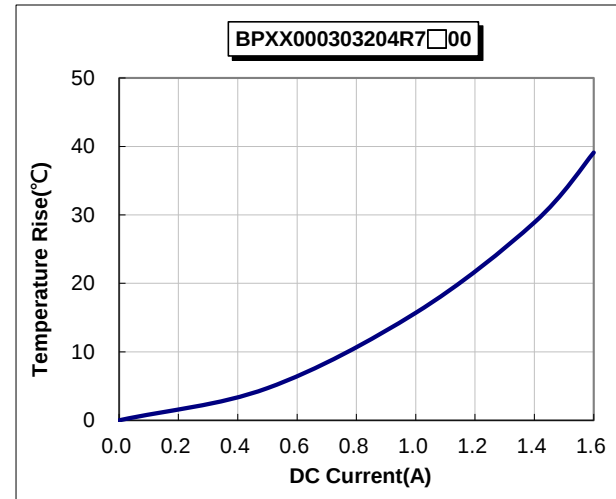
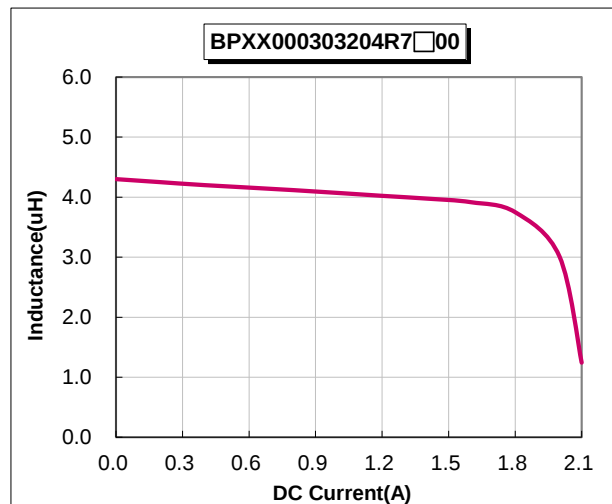
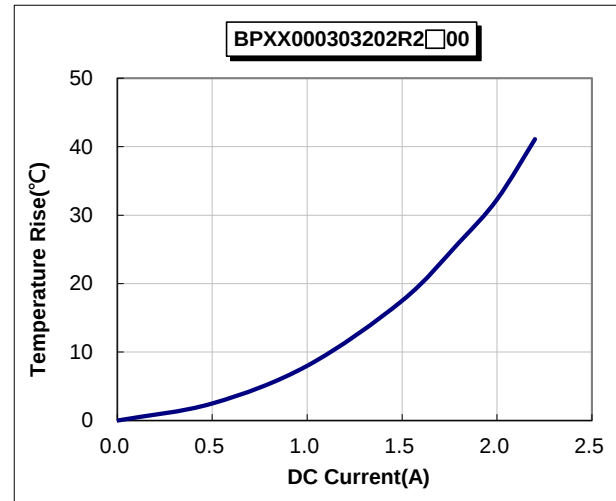
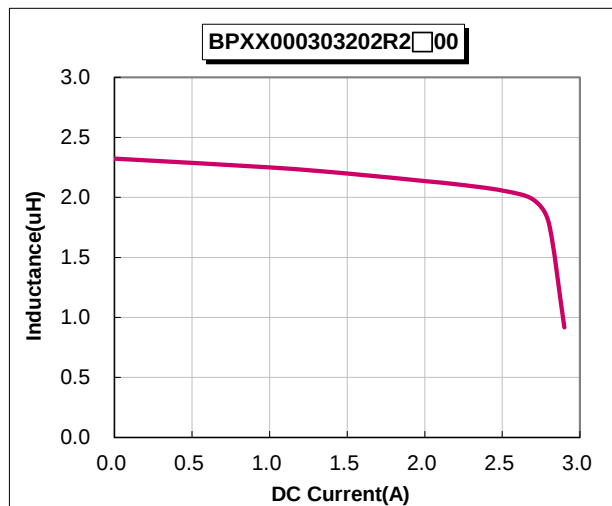
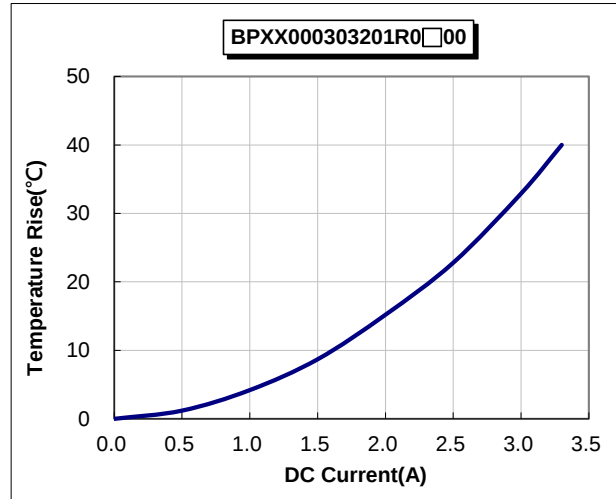
## BPXX00030320 Series Specification

### TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT  
@100KHz/0.1V



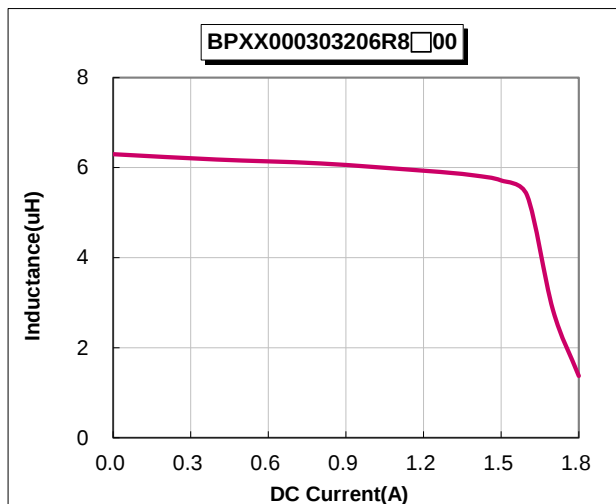
TEMPERATURE vs. DC CURRENT



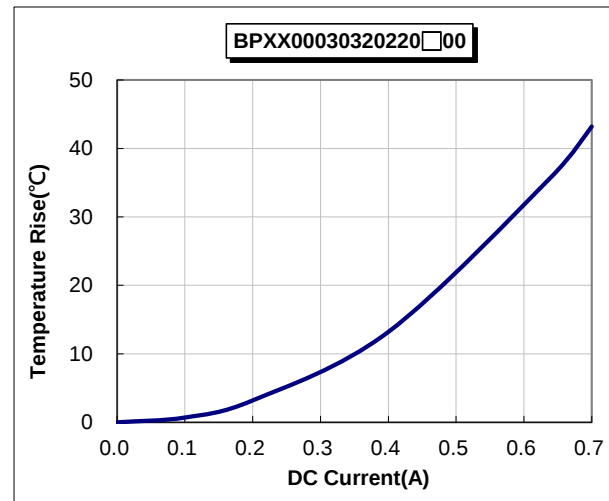
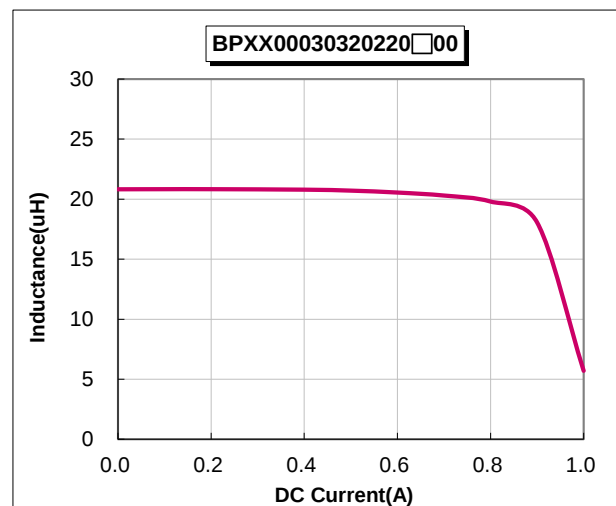
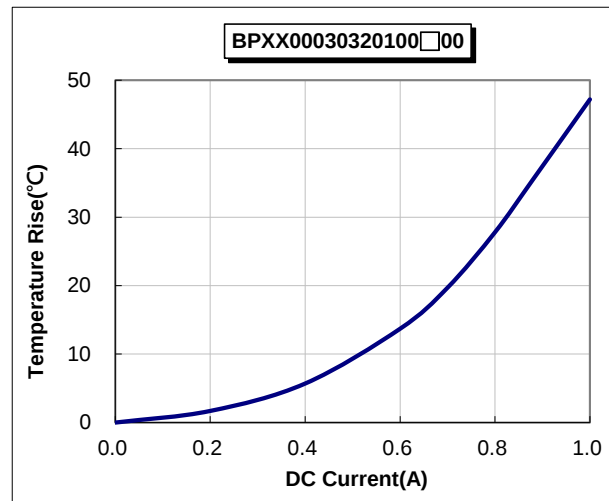
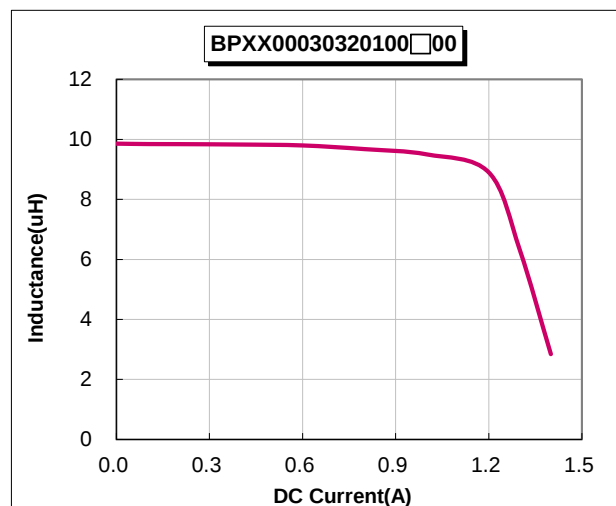
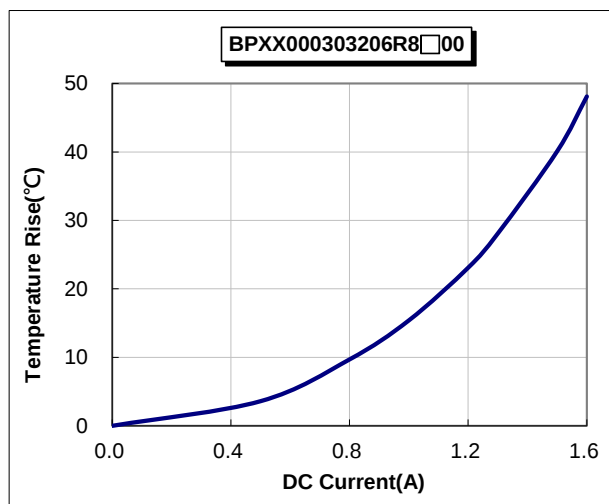
## BPXX00030320 Series Specification

### TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT  
@100KHz/0.1V



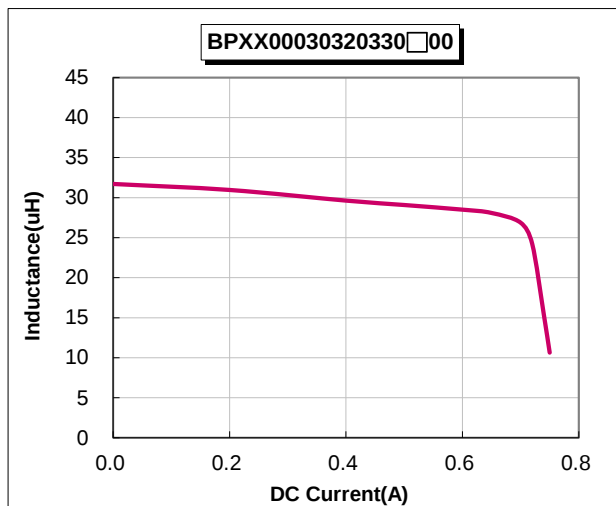
TEMPERATURE vs. DC CURRENT



## BPXX00030320 Series Specification

### TYPICAL ELECTRICAL CHARACTERISTICS

INDUCTANCE vs. DC CURRENT  
@100KHz/0.1V



TEMPERATURE vs. DC CURRENT

