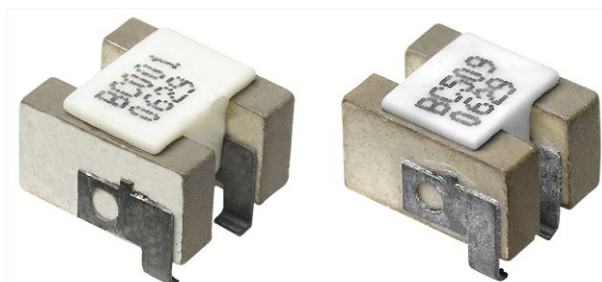


## TWIN Vertical SMD PTC Thermistors For Telecom Overload Protection



### QUICK REFERENCE DATA

| PARAMETER                                       | VALUE      | UNIT             |
|-------------------------------------------------|------------|------------------|
| Resistance value at 25 °C                       | 10 to 50   | $\Omega$         |
| Switching temperature                           | 105 to 130 | °C               |
| Maximum voltage (RMS)                           | 240        | V <sub>RMS</sub> |
| Maximum overload current                        | 2.5 to 8.0 | A                |
| Operating temperature range at V <sub>max</sub> | -40 to 85  | °C               |
| Maximum trip time at 1 A                        | 1.2 to 4.0 | s                |
| Weight                                          | ~ 1.3      | g                |

### DESCRIPTION

The component consists of two high performance PTC ceramics mounted together on an alumina spacer cover and with 4 lead (Pb)-free tin plated contacts. The terminations are joined to the Ag plated ceramics by a high melting solder.

### MARKING

- All TWIN Vertical SMD PTC's are marked with the last 3-digits of the type number (BCxxx) and a date code (YYWW)

### FEATURES

- Very small footprint, allowing to increase the number of lines per PCB
- Matched pairs in one component, significantly reducing the assembly time
- Narrow tracking between the 2 PTC's over a wide temperature range (matching at 85 °C:  $\leq 2 \times$  matching at 25 °C)
- Limited height and weight, used on high speed pick-and-place circuit assembly
- Flat pick-up ceramic area for easy placement
- Small ceramics for faster response time
- Thermal coupled PTC's for enhanced protection
- Small and large pitch available
- Compliant with the enhanced level requirements of ITU - K20-21-45 edition 2003
- Suitable for lead (Pb)-bearing and lead (Pb)-free reflow soldering
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### APPLICATIONS

Over-temperature/over-load protection:

- Telecom
  - Telecommunications infrastructure
  - PABX
  - Set-top Box (S.B.)

### MOUNTING

A flat pick-up area of 30 mm<sup>2</sup> and low weight allows for fast placement. No excessive solder paste should be used as no solder or flux can reach the ceramic body during reflow soldering. Not suitable for bismuth containing solder.

Typical soldering

235 °C, duration: 5 s (Lead (Pb)-bearing)

245 °C, duration: 5 s (Lead (Pb)-free)

Resistance to soldering heat

260 °C, duration: 10 s max.

### ELECTRICAL DATA

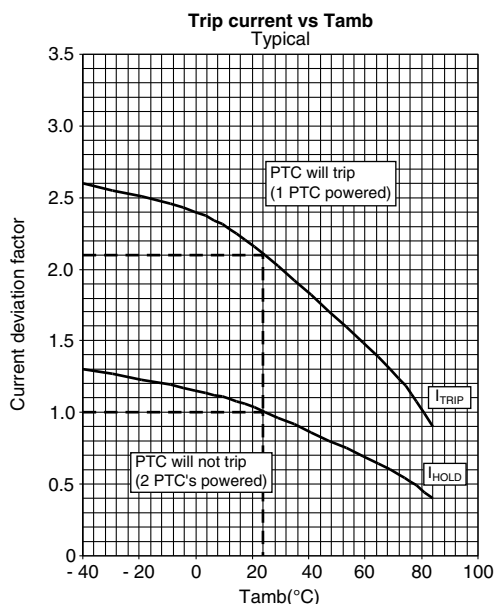
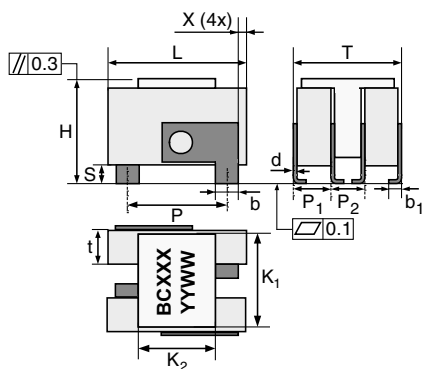
| $R_{25}$<br>$\pm 20\%$<br>( $\Omega$ ) | MATCHING<br>( $\Omega$ ) | V <sub>max.</sub><br>(V <sub>RMS</sub> ) | I <sub>nt</sub> at |               |               | I <sub>t</sub><br>(mA) | MAX.<br>TRIP-TIME<br>at 1 A<br>(s) | I <sub>max.</sub><br>at<br>V <sub>max.</sub><br>(A) | I <sub>res</sub><br>(2 PIECES POWERED)<br>at V <sub>max.</sub><br>(mA) |
|----------------------------------------|--------------------------|------------------------------------------|--------------------|---------------|---------------|------------------------|------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------|
|                                        |                          |                                          | 25 °C<br>(mA)      | 70 °C<br>(mA) | 85 °C<br>(mA) |                        |                                    |                                                     |                                                                        |
| 10                                     | 0.5                      | 240                                      | 140                | 85            | 55            | 300                    | 4.0                                | 4.0                                                 | 12.0                                                                   |
| 20                                     | 0.5                      | 240                                      | 90                 | 60            | 40            | 200                    | 2.0                                | 8.0                                                 | 12.0                                                                   |
| 25                                     | 0.5                      | 240                                      | 100                | 60            | 40            | 200                    | 2.0                                | 4.0                                                 | 12.0                                                                   |
| 35                                     | 1.0                      | 240                                      | 100                | 60            | 40            | 200                    | 1.5                                | 4.0                                                 | 12.0                                                                   |
| 50                                     | 1.0                      | 240                                      | 90                 | 50            | 35            | 190                    | 1.2                                | 2.5                                                 | 12.0                                                                   |

#### Note

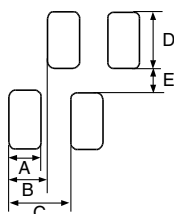
- All data is measured at 25 °C unless otherwise specified

**ORDERING INFORMATION**

| $R_{25} \pm 20\%$<br>( $\Omega$ ) | SAP CODING     |                   |
|-----------------------------------|----------------|-------------------|
|                                   | SMALL PITCH    | LARGE PITCH       |
| 10                                | PTCTT95R100GTE | PTCTT95R100GTELAR |
| 20                                | PTCTT95R200GTE | PTCTT95R200GTELAR |
| 25                                | PTCTT95R250GTE | PTCTT95R250GTELAR |
| 35                                | PTCTT95R350GTE | PTCTT95R350GTELAR |
| 50                                | PTCTT95R500GTE | PTCTT95R500GTELAR |

**ELECTRICAL CHARACTERISTICS**

**PTC OUTLINES**

**DIMENSIONS** in millimeters

|                | SMALL PITCH      | LARGE PITCH      |
|----------------|------------------|------------------|
| L              | $9.0 \pm 0.1$    | $9.0 \pm 0.1$    |
| T              | $7.2 \pm 0.25$   | $8.4 \pm 0.25$   |
| H              | $6.9 \pm 0.25$   | $6.9 \pm 0.25$   |
| b              | $1.5 \pm 0.1$    | $1.5 \pm 0.1$    |
| b <sub>1</sub> | $0.9 \pm 0.15$   | $0.9 \pm 0.15$   |
| S              | $1.25 \pm 0.15$  | $1.25 \pm 0.15$  |
| d              | $0.22 \pm 0.025$ | $0.22 \pm 0.025$ |
| t              | $2.3 \pm 0.1$    | $2.3 \pm 0.1$    |
| P              | $6.5 \pm 0.5$    | $6.5 \pm 0.5$    |
| P <sub>1</sub> | $2.55 \pm 0.15$  | $2.55 \pm 0.15$  |
| P <sub>2</sub> | $2.2 \pm 0.1$    | $3.45 \pm 0.15$  |
| X              | $0.5 \pm 0.2$    | $0.5 \pm 0.2$    |
| K <sub>1</sub> | $6.0 \pm 0.5$    | $7.2 \pm 0.5$    |
| K <sub>2</sub> | $5.0 \pm 0.5$    | $5.0 \pm 0.5$    |

**FOOTPRINT**

**RECOMMENDED FOOTPRINT** in millimeters

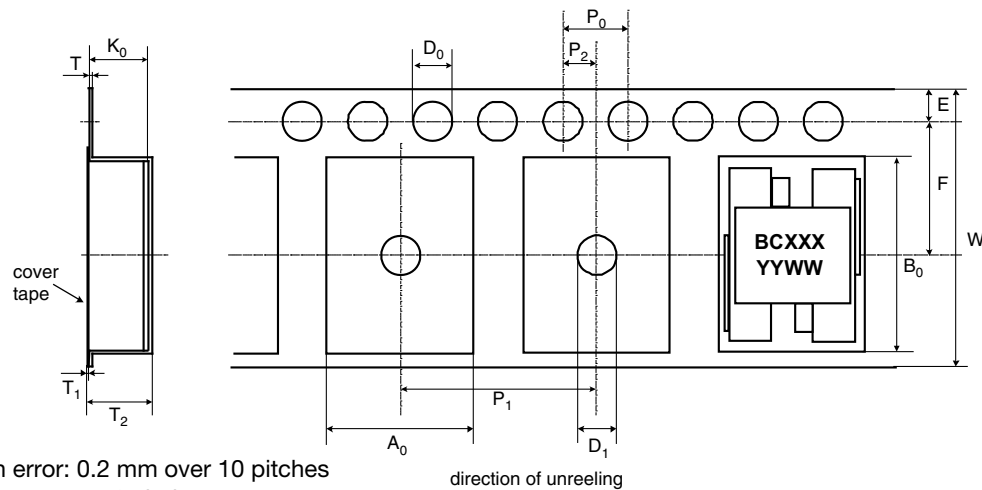
|   | SMALL PITCH | LARGE PITCH |
|---|-------------|-------------|
| A | 2.0         | 2.0         |
| B | 2.4         | 2.4         |
| C | 3.8         | 5.0         |
| D | 3.8         | 4.0         |
| E | 2.7         | 1.4         |

## PACKAGING

### Tape specifications

All tape and reel specifications are in accordance with IEC 60286-3. Carrier tape material is non-conductive polystyrene or polycarbonate.

#### Blister tape



Cumulative pitch error: 0.2 mm over 10 pitches

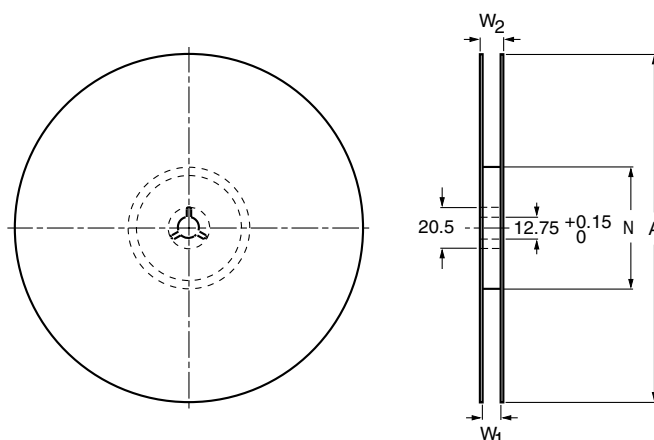
Cumulative tolerance over 10 holes:  $\pm 0.2$  mm

### DIMENSIONS OF BLISTER TAPE in millimeters

|       | SMALL PITCH    | LARGE PITCH    |       | SMALL PITCH    | LARGE PITCH    |
|-------|----------------|----------------|-------|----------------|----------------|
| $A_0$ | $7.2 \pm 0.1$  | $8.4 \pm 0.1$  | $D_1$ | $1.5 \pm 0.1$  | $1.5 \pm 0.1$  |
| $B_0$ | $9.3 \pm 0.1$  | $9.3 \pm 0.1$  | $P_0$ | $4.0 \pm 0.1$  | $4.0 \pm 0.1$  |
| $K_0$ | $7.2 \pm 0.1$  | $7.2 \pm 0.1$  | $P_1$ | $12.0 \pm 0.1$ | $12.0 \pm 0.1$ |
| $W$   | $16.0 \pm 0.3$ | $16.0 \pm 0.3$ | $P_2$ | $2.0 \pm 0.1$  | $2.0 \pm 0.1$  |
| $E$   | $1.75 \pm 0.1$ | $1.75 \pm 0.1$ | $T$   | $0.5 \pm 0.05$ | $0.5 \pm 0.05$ |
| $F$   | $7.5 \pm 0.1$  | $7.5 \pm 0.1$  | $T_1$ | 0.05           | 0.05           |
| $D_0$ | $1.5 \pm 0.1$  | $1.5 \pm 0.1$  | $T_2$ | 7.8 max.       | 7.8 max.       |

### REEL SPECIFICATIONS in millimeters

#### Reel



### REEL DIMENSIONS in millimeters

| UNITS PER REEL | TAPE WIDTH | A   | N  | $W_1$ | $W_2$ MAX. |
|----------------|------------|-----|----|-------|------------|
| 1000           | 16         | 380 | 64 | 16.4  | 20.4       |

#### Note

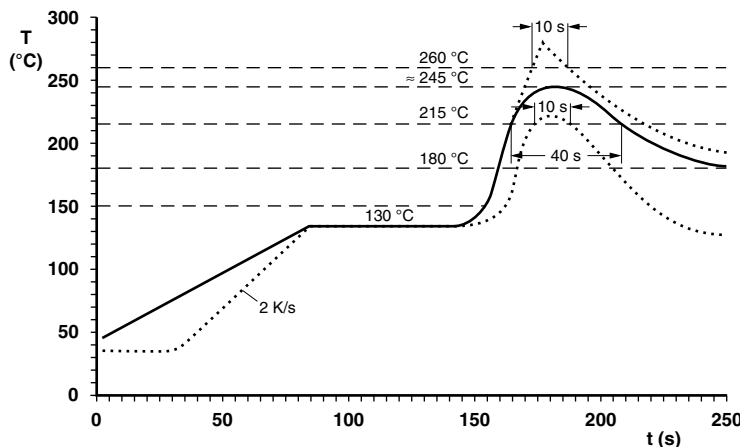
- Reels are packed in sealed plastic bags for protection against high humidity and corrosive atmospheres

## SOLDERING CONDITIONS

This SMD thermistor is only suitable for reflow soldering, in accordance with JEDEC J-STD-020. Soldering processes which can be used are reflow (infrared and convection heating) and vapour phase. The maximum temperature of 260 °C during 10 s should not be exceeded and no liquid flux should be allowed to reach the ceramic body.

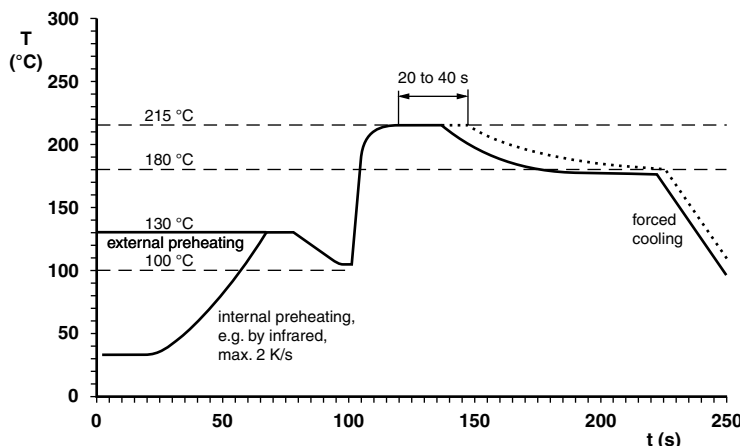
Typical examples of soldering processes that will provide reliable joints without damage, are shown below.

### Reflow soldering



Typical values (solid line)  
Process limits (dotted lines)

### Vapour phase soldering



Typical values (solid line)  
Process limits (dotted line)

## HANDLING PRECAUTIONS

Because of the nature of PTC ceramic material the component should not be touched with bare hands, as the residue of perspiration can influence component behaviour at high temperatures.

Handling forces applied to the component should be limited to 5 N in any condition.



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