NTC Type B Series
Glass Coated Bead Thermistors

Features
Type B05/07/10/14
Small glass coated bead thermistors on fine diameter platinum alloy lead-wires.

- Extremely small sizes
- Very fast thermal response times
- Low heat capacity and high power sensitivity
- Special thin glass coatings provide hermetic seal
- Suitable for self-heated applications such as: gas chromatography, thermal conductivity analysis or gas flow measurement
- Normal operating/storage temperatures range from -112°F (-80°C) to: 221°F (105°C) for Material system E0, 392°F (200°C) for Material systems A1 through A4, 572°F (300°C) for Material systems A5 through D17
- Unaffected by severe environmental exposures, including nuclear radiation
- Intermittent operation to 1112°F (600°C) is permissible, however, stability will be degraded

Type B35/43
Large glass coated bead thermistors on fine diameter platinum alloy lead-wires.

- Suitable for most low cost temperature measurement, control or compensation applications.
- Special thin glass coatings provide hermetic seal
- Suitable for self-heated applications such as liquid level sensing or gas flow measurement
- Normal operating/storage temperatures range from -112°F (-80°C) to: 221°F (105°C) for Material system E0, 392°F (200°C) for Material systems A1 through A4, 572°F (300°C) for Material systems A5 through D17
- Unaffected by severe environmental exposures, including nuclear radiation
- Intermittent operation to 1112°F (600°C) is permissible, however, stability will be degraded
Type B Series Specifications

Type B05/07/10/14

Thermal and Electrical Properties

The following lists the thermal and electrical properties for all small glass coated thermistors. All definitions and test methods per MIL-PRF-23648.

Body Dimensions

B05
- Nominal diameter: 0.005 in (0.13 mm)
- Maximum diameter: 0.0065 in (0.17 mm)
- Maximum length: 0.012 in (0.30 mm)

B07
- Nominal diameter: 0.007 in (0.18 mm)
- Maximum diameter: 0.00850 in (0.22 mm)
- Maximum length: 0.014 in (0.36 mm)

B10
- Nominal diameter: 0.010 in (0.25 mm)
- Maximum diameter: 0.0115 in (0.29 mm)
- Maximum length: 0.020 in (0.510 mm)

B14
- Nominal diameter: 0.014 in (0.36 mm)
- Maximum diameter: 0.016 in (0.417 mm)
- Maximum length: 0.030 in (0.76 mm)

Lead-Wires

B05
- Nominal diameter: 0.0007 in (0.02 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “J” adjacent (stubs), “K” adjacent or “P” opposite

B07
- Nominal diameter: 0.0007 in (0.02 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “J” adjacent (stubs), “K” adjacent or “P” opposite

B10
- Nominal diameter: 0.0011 in (0.03 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “J” adjacent (stubs), “K” adjacent or “P” opposite

Material System

<table>
<thead>
<tr>
<th>Code Letter</th>
<th>R vs T Curve</th>
<th>25/125 Ratio</th>
<th>Nominal Resistance Range at 77°F (25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>B05</td>
</tr>
<tr>
<td>E</td>
<td>0</td>
<td>5.0</td>
<td>-</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>11.8</td>
<td>1 to 1.5 kΩ</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>12.5</td>
<td>1.5 to 3.6 kΩ</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>14</td>
<td>3.6 to 7.5 kΩ</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>16.9</td>
<td>7.5 to 15 kΩ</td>
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<tr>
<td>A</td>
<td>5</td>
<td>19.8</td>
<td>15 to 3.6 kΩ</td>
</tr>
<tr>
<td>A</td>
<td>6</td>
<td>22.1</td>
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<tr>
<td>A</td>
<td>7</td>
<td>22.7</td>
<td>51 to 150 kΩ</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>29.4</td>
<td>150 to 270 kΩ</td>
</tr>
<tr>
<td>B</td>
<td>9</td>
<td>30.8</td>
<td>270 to 470 kΩ</td>
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<td>B</td>
<td>10</td>
<td>32.3</td>
<td>470 to 750 kΩ</td>
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<td>B</td>
<td>11</td>
<td>35.7</td>
<td>750 to 1.6 MΩ</td>
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<tr>
<td>B</td>
<td>12</td>
<td>38.1</td>
<td>1.6 to 2.7 MΩ</td>
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<td>B</td>
<td>13</td>
<td>45</td>
<td>2.7 to 6.8 MΩ</td>
</tr>
<tr>
<td>B</td>
<td>14</td>
<td>48.1</td>
<td>6.8 to 10 MΩ</td>
</tr>
<tr>
<td>B</td>
<td>15</td>
<td>56.5</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>16</td>
<td>75.6</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>17</td>
<td>81</td>
<td>-</td>
</tr>
</tbody>
</table>
Type B Series Specifications

Thermal Time Constant

B05
• Still air at 77°F (25°C): 0.12 second
• Plunge into water: 5.0 msec
B07
• Still air at 77°F (25°C): 0.23 second
• Plunge into water: 7.0 msec
B10
• Still air at 77°F (25°C): 0.5 second
• Plunge into water: 10 msec
B14
• Still air at 77°F (25°C): 1 second
• Plunge into water: 15 msec

Dissipation Constant

B05
• Still air at 77°F (25°C): 0.045 mW/°C
• Still water at 77°F (25°C): 0.23 mW/°C
B07
• Still air at 77°F (25°C): 0.06 mW/°C
• Still water at 77°F (25°C): 0.3 mW/°C
B10
• Still air at 77°F (25°C): 0.09 mW/°C
• Plunge into water: 0.45 mW/°C
B14
• Still air at 77°F (25°C): 0.10 mW/°C
• Plunge into water: 0.50 mW/°C

Power Rating (In Air)

B05
• Maximum Power Rating: 0.006 W
• 100% Maximum Power To: 77°F (25°C)
• Derated to 0% at: 392°F (200°C)
B07
• Maximum Power Rating: 0.008 W
• 100% Maximum Power To: 77°F (25°C)
• Derated to 0% at: 392°F (200°C)
B10
• Maximum Power Rating: 0.010 W
• 100% Maximum Power To: 77°F (25°C)
• Derated to 0% at: 392°F (200°C)
B14
• Maximum Power Rating: 0.014 W
• 100% Maximum Power To: 77°F (25°C)
• Derated to 0% at: 392°F (200°C)

Options

• Non-standard resistance tolerances
• Non-standard resistance values
• Reference temperature(s) other than 77°F (25°C)—specify
• Mounting in special housings or enclosures
• Longer continuous leads
• Welded or soldered extension leads—specify lead material, diameter, length, and insulation, if any
• Solderable or weldable/solderable leads
• Calibration—specify temperature(s)
• Interchangeable pairs or sets, R-vs-T curve matching—specify temperature range(s) and tolerance(s)
• Special aging and conditioning for high reliability applications

Type B35/43
Thermal and Electrical Properties

The following lists the thermal and electrical properties for all large glass coated thermistors. All definitions and test methods per MIL-PRF-23648.

Body Dimensions

B35
• Nominal diameter: 0.035 in (0.893 mm)
• Maximum diameter: 0.043 in (1.1 mm)
• Maximum length: 0.075 in (1.9 mm)
B43
• Nominal diameter: 0.043 in (1.1 mm)
• Maximum diameter: 0.050 in (1.32 mm)
• Maximum length: 0.100 in (2.5 mm)

Lead-Wires

B35
• Nominal diameter: 0.004 in (0.10 mm)
• Maximum lead length: 0.312 in (7.9 mm)
• Lead material: platinum alloy
• Available cuts: “J” adjacent (stubs), “K” adjacent or “P” opposite
B43
• Nominal diameter: 0.004 in (0.102 mm)
• Maximum lead length: 0.312 in (7.9 mm)
• Lead material: platinum alloy
• Available cuts: “J” adjacent (stubs), “K” adjacent or “P” opposite
Material System (Table B)

<table>
<thead>
<tr>
<th>Code Letter</th>
<th>R vs T Curve</th>
<th>25/125 Ratio</th>
<th>Nominal Resistance Range at 77°F (25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>0</td>
<td>5.0</td>
<td>30 to 51 Ω</td>
</tr>
<tr>
<td>A</td>
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<td>51 to 150 Ω</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>12.5</td>
<td>150 to 360 Ω</td>
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<tr>
<td>A</td>
<td>3</td>
<td>14</td>
<td>360 to 750 Ω</td>
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<tr>
<td>A</td>
<td>4</td>
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<td>A</td>
<td>7</td>
<td>22.7</td>
<td>6.2 to 9.1 kΩ</td>
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<td>B</td>
<td>8</td>
<td>29.4</td>
<td>9.1 to 27 kΩ</td>
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<td>9</td>
<td>30.8</td>
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<td>12</td>
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<td>160 to 360 kΩ</td>
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<td>14</td>
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<td>B</td>
<td>15</td>
<td>56.5</td>
<td>1.5 to 3.0 MΩ</td>
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<td>D</td>
<td>16</td>
<td>75.6</td>
<td>3.0 to 8.2 MΩ</td>
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<tr>
<td>D</td>
<td>17</td>
<td>81</td>
<td>8.2 to 20 MΩ</td>
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<table>
<thead>
<tr>
<th>Code Letter</th>
<th>Diameter</th>
<th>Material System Code</th>
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</thead>
<tbody>
<tr>
<td>X</td>
<td>See table A or table B for code number</td>
<td></td>
</tr>
</tbody>
</table>

Options

- Non-standard resistance tolerances
- Non-standard resistance values
- Reference temperature(s) other than 77°F (25°C) - specify
- Mounting in special housings or enclosures
- Longer continuous leads
- Welded or soldered extension leads - specify lead material, diameter, length, and insulation, if any
- Solderable or weldable/solderable leads
- Calibration - specify temperature(s)
- Interchangeable pairs or sets, R-vs-T curve matching; specify temperature range(s) and tolerance(s)
- Special aging and conditioning for high reliability applications

Ordering Information

The code number to be ordered may be specified as follows:

- Code
- Type
- B Glass coated bead structure
- Code Diameter
- 05 05 mils
- 07 07 mils
- 10 10 mils
- 14 14 mils
- 35 35 mils
- 43 43 mils
- Code Lead Configuration
- J Adjacent leads
- K Adjacent leads with stub ends glass coated
- P Opposite leads
- Code Material System Code
- X See table A or table B for code number

Special tolerances are available upon request. Consult factory for special resistance tolerances, non-standard resistances and/or non-standard temperatures.

Thermal Time Constant

B35
- Still air at 77°F (25°C): 4.5 second
- Plunge into water: 100 msec

B43
- Still air at 77°F (25°C): 5.5 second
- Plunge into water: 140 msec

Dissipation Constant

B35
- Still air at 77°F (25°C): 0.30 mW/°C
- Still water at 77°F (25°C): 1.50 mW/°C

B43
- Still air at 77°F (25°C): 0.35 mW/°C
- Still water at 77°F (25°C): 2.00 mW/°C

Power Rating (In Air)

B35
- Maximum Power Rating: 0.035 W
- 100% Maximum Power To: 302°F (150°C)
- Maximum Power Rating: 0.035 W
- 100% Maximum Power To: 302°F (150°C)
- Derated to 0% at: 572°F (300°C)

B43
- Maximum Power Rating: 0.035 W
- 100% Maximum Power To: 302°F (150°C)
- Derated to 0% at: 572°F (300°C)

*The zero-power resistance at 77°F (25°C), expressed in Ω, is identified by a three digit code number. The first two digits represent significant figures, and the last digit specifies the number of zeros to follow. Example: 10k Ω = “103”. The standard resistance values are from the 24-Value series decade as specified in Military Standard MS90178.

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