Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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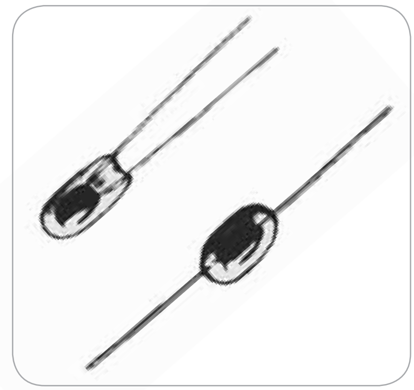
THERMOMETRICS
A COMMITMENT TO EXCELLENCE

NTC Type BR Series

Glass Encapsulated Bead Thermistors



Features

Type BR11/14/16/25

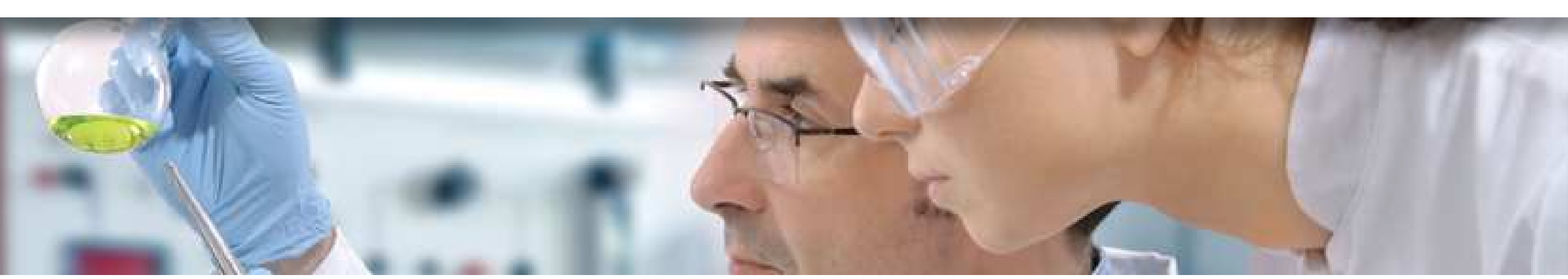
Small glass encapsulated bead thermistors on fine diameter alloy lead-wires.

- Suitable for most low cost temperature measurement, control or compensation applications
- Very fast thermal response times
- Rugged glass encapsulation provides hermetic seal and better strain relief than small glass coated bead thermistors
- Long term stability is better than small glass coated bead thermistors
- Suitable for self-heated applications such as liquid level sensing or gas flow measurement
- Recommended for all applications where the customer will perform further assembly operations
- 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 B32/42/55

Large glass encapsulated bead thermistors on fine diameter platinum alloy lead-wires.

- Suitable for most low cost temperature measurement, control or compensation applications
- Fast thermal response times
- Rugged glass encapsulation provides hermetic seal and better strain relief than large glass coated bead thermistors
- Long term stability is better than large glass coated bead thermistors
- Suitable for self-heated applications such as liquid level sensing or gas flow measurement
- Recommended for all applications where the customer will perform further assembly operations
- 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



Amphenol

Advanced Sensors

Type BR Series Specifications

Type BR11/14/16/23

Thermal and Electrical Properties

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

Body Dimensions

BR11
- Nominal diameter: 0.011 in (0.28 mm)
- Maximum diameter: 0.012 in (0.30 mm)
- Maximum length: 0.0242 in (0.610 mm)

BR14
- Nominal diameter: 0.014 in (0.36 mm)
- Maximum diameter: 0.016 in (0.41 mm)
- Maximum length: 0.032 in (0.81 mm)

BR16
- Nominal diameter: 0.016 in (0.41 mm)
- Maximum diameter: 0.017 in (0.43 mm)
- Maximum length: 0.034 in (0.86 mm)

BR23
- Nominal diameter: 0.023 in (0.58 mm)
- Maximum diameter: 0.025 in (0.63 mm)
- Maximum length: 0.056 in (1.46 mm)

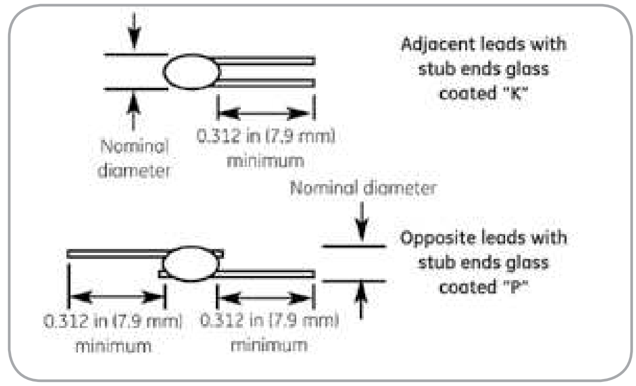
Lead-Wires

BR11
- Nominal diameter: 0.0007 in (0.02 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite

BR14
- Nominal diameter: 0.0011 in (0.03 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite

BR16
- Nominal diameter: 0.0011 in (0.03 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite

BR23
- Nominal diameter: 0.002 in (0.05 mm)
- Maximum lead length: 0.312 in (8 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite



Type BR Series dimensions

Material System (Table A)

Code Letter	R vs T Curve	25/125 Ratio	Nominal Resistance Range at 77°F (25°C)			
			BR11	BR14	BR16	BR23
E	0	5.0	–	–	–	–
A	1	11.8	1 to 1.5 kΩ	300 to 680 Ω	300 to 680 Ω	300 to 680 Ω
A	2	12.5	1.5 to 3.6 kΩ	680 to 1.6 kΩ	680 to 1.6 kΩ	680 to 1.6 kΩ
A	3	14	3.6 to 7.5 kΩ	1.6 to 3.6 kΩ	1.6 to 3.6 kΩ	1.6 to 3.6 kΩ
A	4	16.9	7.5 to 15 kΩ	3.6 to 6.8 kΩ	3.6 to 6.8 kΩ	3.6 to 6.8 kΩ
A	5	19.8	15 to 51 kΩ	6.8 to 27 kΩ	6.8 to 27 kΩ	6.8 to 27 kΩ
A	6	22.1	–	–	–	–
A	7	22.7	51 to 150 kΩ	27 to 75 kΩ	27 to 75 kΩ	27 to 75 kΩ
B	8	29.4	150 to 270 kΩ	75 to 130 kΩ	75 to 130 kΩ	75 to 130 kΩ
B	9	30.8	270 to 470 kΩ	130 to 240 kΩ	130 to 240 kΩ	130 to 240 kΩ
B	10	32.3	470 to 750 kΩ	240 to 360 kΩ	240 to 360 kΩ	240 to 360 kΩ
B	11	35.7	750 to 1.6 MΩ	360 to 820 kΩ	360 to 820 kΩ	360 to 820 kΩ
B	12	38.1	1.6 to 2.7 MΩ	820 to 1.3 MΩ	820 to 1.3 MΩ	820 to 1.3 MΩ
B	13	45	2.7 to 6.8 MΩ	1.3 to 3.36 MΩ	1.3 to 3.36 MΩ	1.3 to 3.36 MΩ
B	14	48.1	6.8 to 10 MΩ	3.3 to 6.86 MΩ	3.3 to 6.86 MΩ	3.3 to 6.86 MΩ
B	15	56.5	–	6.8 to 10 MΩ	6.8 to 10 MΩ	6.8 to 10 MΩ
D	16	75.6	–	–	–	–
D	17	81	–	–	–	–

Thermal Time Constant

BR11
- Still air at 77°F (25°C): 0.8 second
- Plunge into water: 12 msec

BR14
- Still air at 77°F (25°C): 1 second
- Plunge into water: 14 msec

BR16
- Still air at 77°F (25°C): 1.2 second
- Plunge into water: 16 msec

BR23
- Still air at 77°F (25°C): 1.7 second
- Plunge into water: 40 msec

Type BR Series Specifications

Dissipation Constant

BR11
- Still air at 77°F (25°C): 0.065 mW/°C
- Still water at 77°F (25°C): 0.33 mW/°C

BR14
- Still air at 77°F (25°C): 0.10 mW/°C
- Still water at 77°F (25°C): 0.50 mW/°C

BR16
- Still air at 77°F (25°C): 0.12 mW/°C
- Plunge into water: 0.60 mW/°C

BR23
- Still air at 77°F (25°C): 0.18 mW/°C
- Plunge into water: 0.9 mW/°

Power Rating (In Air)

BR11
- Maximum Power Rating: 0.007 W
- 100% Maximum Power To: 257°F (125°C)
- Derated to 0% at: 572°F (300°C)

BR14
- Maximum Power Rating: 0.015 W
- 100% Maximum Power To: 257°F (125°C)
- Derated to 0% at: 572°F (300°C)

BR16
- Maximum Power Rating: 0.015 W
- 100% Maximum Power To: 257°F (125°C)
- Derated to 0% at: 572°F (300°C)

BR23
- Maximum Power Rating: 0.020 W
- 100% Maximum Power To: 257°F (125°C)
- Derated to 0% at: 572°F (300°C)

Options

- Non-standard resistance tolerances
- Non-standard resistance values
- Specify reference temperature(s) if it is not 77°F (25°C)
- 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
- Leads can be pre-tinned or treated for improved soldering
- 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 BR32/42/55

Thermal and Electrical Properties

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

Body Dimensions

BR32
- Nominal diameter: 0.032 in (0.81 mm)
- Maximum diameter: 0.033 in (0.84 mm)
- Maximum length: 0.084 in (2.1 mm)

BR42
- Nominal diameter: 0.042 in (1.16 mm)
- Maximum diameter: 0.046 in (1.2 mm)
- Maximum length: 0.095 in (2.4 mm)

BR55
- Nominal diameter: 0.055 in (1.41 mm)
- Maximum diameter: 0.060 in (1.5 mm)
- Maximum length: 0.120 in (3 mm)

Lead-Wires

BR32
- Nominal diameter: 0.003 in (0.08 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite

BR42
- Nominal diameter: 0.004 in (0.10 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite

BR55
- Nominal diameter: 0.004 in (0.10 mm)
- Maximum lead length: 0.312 in (7.9 mm)
- Lead material: platinum alloy
- Available cuts: “K” adjacent or “P” opposite

Thermal Time Constant

BR32
- Still air at 77°F (25°C): 4.5 second
- Plunge into water: 90 msec

BR42
- Still air at 77°F (25°C): 5 second
- Plunge into water: 140 msec

BR55
- Still air at 77°F (25°C): 7 second
- Plunge into water: 200 msec

Material System (Table B)

Code Letter	R vs T Curve	25/125 Ratio	Nominal Resistance Range at 77°F (25°C)		
			BR32	BR42	BR55
E	0	5.0	-	30 to 51 Ω	30 to 51 Ω
A	1	11.8	100 to 300 Ω	51 to 150 Ω	51 to 150 Ω
A	2	12.5	300 to 750 Ω	150 to 360 Ω	150 to 360 Ω
A	3	14	750 to 1.5 kΩ	360 to 750 Ω	360 to 750 Ω
A	4	16.9	1.5 to 3.0 kΩ	750 to 1.5 kΩ	750 to 1.5 kΩ
A	5	19.8	3.0 to 6.8 kΩ	1.5 to 3.6 kΩ	1.5 to 3.6 kΩ
A	6	22.1	6.8 to 13 kΩ	3.6 to 6.2 kΩ	3.6 to 6.2 kΩ
A	7	22.7	13 to 18 kΩ	6.2 to 9.1 kΩ	6.2 to 9.1 kΩ
B	8	29.4	18 to 51 kΩ	9.1 to 27 kΩ	9.1 to 27 kΩ
B	9	30.8	51 to 82 kΩ	27 to 43 kΩ	27 to 43 kΩ
B	10	32.3	82 to 150 kΩ	43 to 75 kΩ	43 to 75 kΩ
B	11	35.7	150 to 330 kΩ	75 to 160 kΩ	75 to 160 kΩ
B	12	38.1	330 to 680 kΩ	160 to 360 kΩ	160 to 360 kΩ
B	13	45	680 to 1.5 MΩ	360 to 750 kΩ	360 to 750 kΩ
B	14	48.1	1.5 to 3.0 MΩ	750 to 1.5 MΩ	750 to 1.5 MΩ
B	15	56.5	3.0 to 6.2 MΩ	1.5 to 3.0 MΩ	1.5 to 3.0 MΩ
D	16	75.6	6.2 to 10 MΩ	3.0 to 8.2 MΩ	3.0 to 8.2 MΩ
D	17	81	-	8.2 to 20 MΩ	8.2 to 20 MΩ

Dissipation Constant

BR32

- Still air at 77°F (25°C): 0.285 mW/°C
- Still water at 77°F (25°C): 1.4 mW/°C

BR42

- Still air at 77°F (25°C): 0.33 mW/°C
- Still water at 77°F (25°C): 1.65 mW/°C

BR55

- Still air at 77°F (25°C): 0.5 mW/°C
- Still water at 77°F (25°C): 2.50 mW/°C

Power Rating (In Air)

BR32

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

BR42

- Maximum Power Rating: 0.042 W
- 100% Maximum Power To: 302°F (150°C)
- Derated to 0% at: 572°F (300°C)

BR55

- Maximum Power Rating: 0.050 W
- 100% Maximum Power To: 302°F (150°C)
- Derated to 0% at: 572°F (300°C)

Options

- Non-standard resistance tolerances
- Non-standard resistance values
- Specify reference temperature(s) if it is not 77°F (25°C)
- 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
- Leads can be pre-tinned or treated for improved soldering
- 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
BR	Ruggedized bead structure

Code	Diameter
11	11 mils
14	14 mils
16	16 mils
23	23 mils
32	32 mils
42	42 mils
55	55 mils

Code	Lead Configuration
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

Code	Power
X	Zero-power resistance as 77°F (25°C) (see note 2 for code number)

Code	Tolerance*
F	1
G	2
J	5
K	10
L	15
M	20
N	25
P	30
Q	40
R	50
S	Non-standard (consult factory)

BR - ____ - ____ - ____ - ____ - ____ Typical model number

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

*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.
1.0 / 1.1 / 1.2 / 1.3 / 1.5 / 1.6 / 1.8 / 2.0 / 2.2 / 2.4 / 2.7 / 3.0
3.3 / 3.6 / 3.9 / 4.3 / 4.7 / 5.1 / 5.6 / 6.2 / 6.8 / 7.5 / 8.2 / 9.1

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