

NTC THERMISTORS: TYPE BR11/14/16/23

GLASS ENCAPSULATED BEAD THERMISTOR

DESCRIPTION:

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

FEATURES:

- 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 -80°C to:

105°C for Material system E0 200°C for Material systems A1 through A4 300°C for Material systems A5 through D17

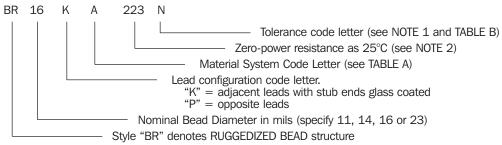
- Unaffected by severe environmental exposures, including nuclear radiation.
- Intermittent operation to 600°C is permissible, however, stability will be degraded.

OPTIONS:

- Non-standard resistance tolerances
- Non-standard resistance values
- Reference temperature(s) other than 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
- 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

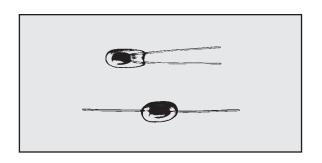
CODING:

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



- **NOTE 1:** Special tolerances are available upon request. Consult factory for special resistance tolerances, non-standard resistances and/or non-standard temperatures.
- NOTE 2: The zero-power resistance at 25°C, expressed in Ohms, 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: 22k Ohms= "223". 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



DIMENSIONS:

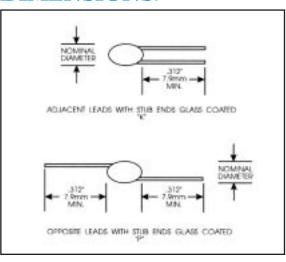


TABLE A: THERMAL AND ELECTRICAL PROPERTIES:

The following table lists the THERMAL and ELECTRICAL properties for all SMALL RUGGEDIZED THERMISTORS. All definitions and test methods are per MIL-PRF-23648.

THERMISTOR SERIES:			BR11		BR14		BR16		BR23		
BODY DIMENS											
	Nom. Diameter:		.011"	(.28 mm)	.014"	(.36 mm)	.016"	(.41 mm)	.023"	(.58 mm)	
	Max. Diameter:		.012"	(.30 mm)	.016"	(.41 mm)	.017"	(.43 mm)	.025"	(.63 mm)	
	Max. Length:		.024"	(.61 mm)	.032"	(.81 mm)	.034"	(.86 mm)	.056"	(1.4 mm)	
lead-wires:											
	Nom. Diameter:			(.02 mm)	.0011"	(.03 mm)	.0011"	(.03 mm)	.002"	(.05 mm)	
	Minimum Lead Length:			(7.9 mm)	.312"	(7.9 mm)	.312" (7.9 mm)		.312" (7.9 mm)		
	Lead Material:			n Alloy	Platinum	Platinum Alloy		Platinum Alloy		Platinum Alloy	
		Available Cuts:	"K"	adjacent	"K"	adjacent	"K"	adjacent	"K"	adjacent	
			"P"	opposite	"P"	opposite	"P"	opposite	"P"	opposite	
			ļ <u>.</u> .								
	MATERIAL SYSTEM:			minal	_	minal	Nominal		Nominal		
CODE	-			stance	Resistance Range @ 25°C		Resistance Range @ 25°C		Resistance Range @ 25°C		
LETTER	CURVE	RATIO	Range	@ 25°C	Range	@ 25 C	Range	e @ 25°C	Range	@ 25°C	
Е	0	5.0		_	-	_		_		_	
А	1	11.8	1	$-$ 1.5 k Ω	300 Ω	$-$ 680 Ω	300 Ω	$-$ 680 Ω	300 Ω	– 680 Ω	
А	2	12.5	1.5 kΩ	$-$ 3.6 k Ω		$-$ 1.6 Ω	680 Ω	$-$ 1.6 Ω	680 Ω	$-$ 1.6 Ω	
А	3	14.0	1	$-$ 7.5 k Ω	-	$-$ 3.6 k Ω		$-$ 3.6 k Ω	1	$-$ 3.6 k Ω	
А	4	16.9	1	$-$ 15 k Ω		$-$ 6.8 k Ω		$-$ 6.8 k Ω		$-$ 6.8 k Ω	
А	5	19.8	15 kΩ	$-$ 51 k Ω	6.8 kΩ	$-$ 27 k Ω	6.8 kΩ	$-$ 27 k Ω	6.8 VΩ	– 27 kΩ	
Α	6	22.1			-			_		_	
Α	7	22.7	1	$-$ 150 k Ω		$-75~\mathrm{k}\Omega$	1	$-75~\text{k}\Omega$	1	$-75 \text{ k}\Omega$	
В	8	29.4		– 270 kΩ	1	– 130 kΩ		– 130 kΩ		– 130 kΩ	
В	9	30.8	1	– 470 kΩ	1	– 240 kΩ		– 240 kΩ	1	– 240 kΩ	
В	10	32.3	1	– 750 kΩ	1	– 360 kΩ		– 360 kΩ	1	– 360 kΩ	
В	11	35.7		- 1.6 MΩ		– 820 kΩ	1	- 820 kΩ		– 820 kΩ	
В	12	38.1	1	$-2.7~\mathrm{M}\Omega$	1	- 1.3 MΩ		- 1.3 MΩ	1	- 1.3 MΩ	
В	13	45.0	1	- 6.8 MΩ	1	- 3.3 MΩ		- 3.3 MΩ	1	- 3.3 MΩ	
B B	14	48.1	6.8 1012	$-$ 10 M Ω		- 6.8 MΩ		- 6.8 MΩ		- 6.8 MΩ	
D B	15 16	56.5 75.6		_	0.8 1/122	– 10 MΩ	0.8 1/122	– 10 MΩ	0.8 1/11/2	– 10 MΩ	
D	16 17	81.0		_	-			_			
	11	61.0		_	-			_			
THERMAL TIM	IF CONSTANT:										
11121311732 11141		Still Air at 25°C:	0.8	3 sec	1 () sec	1	2 sec	1	7 sec	
		nge into Water:		msec		msec		msec		msec	
	. 14	G			-						
DISSIPATION	CONSTANT:										
	Still Air at 25°C:				.10 mW/°C		.12 mW/°C		.18	mw/°C	
	Still	Water at 25°C:	.33 ו	mW/°C	.50 mW/°C		.60 mW/°C		.90 mW/°C		
POWER RATING: (in air)											
Maximum Power Rating:			.007 Watts		.015 Watts		.015 Watts		.020 Watts		
	12	25°C	12	25°C	125°C		125°C				
	30	0°C	30	00°C	300°C		30	00°C			
									1		

RESISTANCE -VS- TEMPERATURE CHARACTERISTICS: The nominal resistance range for the zero-power resistance at 25°C is shown for each THERMISTOR Type and each available Material System. Each Material System is denoted by an ordering Code Letter, a referenced Curve number and the nominal 25°C/125°C resistance ratio.

TABLE B: STANDARD TOLERANCES:

Tolerance Code Letter	F	G	J	K	L	М	N	Р	Q	R	S
± % Tolerance at 25°C	1	2	5	10	15	20	25	30	40	50	Non-standard – consult factory