

# NTC Thermistors, Radial Leaded, Accuracy Line


**RoHS**  
COMPLIANT

## FEATURES

- Accurate over a wide temperature range (tolerance on B-value down to 0.5 %)
- Good stability over a long life
- Excellent price/performance ratio
- Low heat conductivity through 0.4 mm Ni-leads
- cULus recognized, file E148885 (UL category XGPU2/XGPU8)
- Mounting: radial
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

## APPLICATIONS

- Temperature measurement, sensing and control in industrial, consumer, and telecom applications. For on-board sensing or accurate remote sensing

## DESCRIPTION

These thermistors are made of NTC ceramic material. The device consists of a chip with two tinned nickel leads. The parts are coated and color marked.

## PACKAGING

The thermistors are packed in cardboard boxes; the smallest packing quantity is 500 units.

## DESIGN-IN SUPPORT

For complete curve computation, please visit: [www.vishay.com/en/thermistors/ntc-rt-calculator/](http://www.vishay.com/en/thermistors/ntc-rt-calculator/).

## MARKING

The thermistors are marked with colored dots on a gray epoxy base coating; see Dimensions and "Electrical Data and Ordering Information".

## CAUTIONS AND WARNINGS ON MOUNTING AND HANDLING

Please read the special instructions: see [www.vishay.com/doc?29222](http://www.vishay.com/doc?29222).

By soldering in any position. Not intended for potting.


## LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	2K to 470K	Ω
Tolerance on $R_{25}$ -value	± 1; ± 2; ± 3; ± 5	%
$B_{25/85}$ -value	3528 to 4570	K
Tolerance on $B_{25/85}$ -value	± 0.5 to ± 2.0	%
Operating temperature range at: Zero power dissipation (continuously) Zero power dissipation (for short periods) <sup>(2)</sup>	-40 to +125 ≤ 150	°C
Maximum power dissipation at 55 °C	100	mW
Dissipation factor $\delta$ in still air (for info)	2.2	mW/K
Response time <sup>(1)</sup>	≈ 1.7	s
Thermal time constant $\tau$ <sup>(1)</sup>	13	s
Mass	≈ 0.11	g

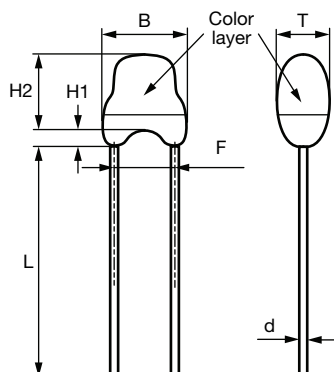
### Notes

- <sup>(1)</sup> Response time in silicone oil MS200/50. This is the time needed for the sensor to reach 63.2 % of the total temperature difference when subjected to a temperature change from 25 °C in air to 85 °C in oil. Thermal time constant by cooling from electrically pre-heated body
- <sup>(2)</sup> Valid for all types with the exception of the  $R_{25}$  values 12 kΩ, 22 kΩ and 470 kΩ

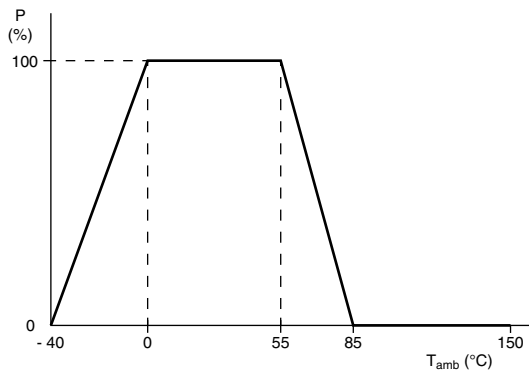
ELECTRICAL DATA AND ORDERING INFORMATION							
$R_{25}$ (Ω)	$R_{25}$ -TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$ -TOL. (± %)	COLOR MARKING	UL RECOG. 	SAP MATERIAL AND ORDERING NUMBER <sup>(1)</sup>	
						RoHS-COMPLIANT WITH EXEMPTION <sup>(2)</sup>	RoHS-COMPLIANT
2000	1, 2, 3, 5	3528	0.5	Orange	✓	NTCLE203E3202*B0	NTCLE203E3202*B0A
2700	1, 2, 3, 5	3977	0.75	Red	✓	NTCLE203E3272*B0	NTCLE203E3272*B0A
4700	1, 2, 3, 5	3977	0.75	Green	✓	NTCLE203E3472*B0	NTCLE203E3472*B0A
5000	1, 2, 3, 5	3977	0.75	Pink	✓	NTCLE203E3502*B0	NTCLE203E3502*B0A
10 000	1, 2, 3, 5	3977	0.75	Blue	✓	NTCLE203E3103*B0	NTCLE203E3103*B0A
12 000	1, 2, 3, 5	3740	2	Yellow	✓	NTCLE203E3123*B0	NTCLE203E3123*B0A
22 000	1, 2, 3, 5	3740	2	White	✓	NTCLE203E3223*B0	NTCLE203E3223*B0A
47 000	1, 2, 3, 5	4090	1.5	Black	✓	NTCLE203E3473*B0	NTCLE203E3473*B0A
68 000	1, 2, 3, 5	4190	1.5	Grey	✓	NTCLE203E3683*B0	NTCLE203E3683*B0A
100 000	1, 2, 3, 5	4190	1.5	Brown	✓	NTCLE203E3104*B0	NTCLE203E3104*B0A
470 000	2, 3, 5	4570	1.5	Violet	✓	NTCLE203E3474*B0	NTCLE203E3474*B0A

### Notes

- Preferred versions for new designs
- <sup>(1)</sup> Replace \* in SAP by J for ± 5 %, H for ± 3 %, G for ± 2 %, F for ± 1 %
  - <sup>(2)</sup> RoHS exemption 7(c)-I: electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezo-electronic devices, or in a glass or ceramic matrix compound

**DIMENSIONS** in millimeters


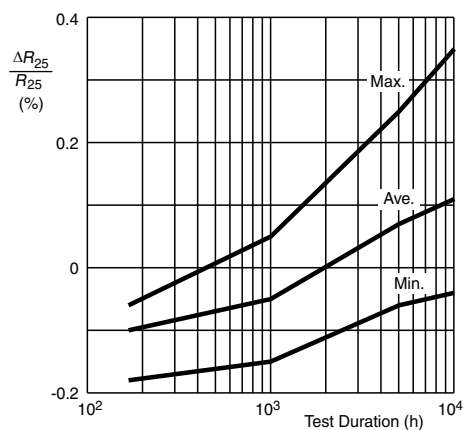
B max.	T max.	H <sub>1</sub>	H <sub>2</sub> max.	L	d	F
3.6	3.0	2.0 ± 1.0	6.0	40 ± 1.5	0.4 ± 0.04	2.54

**DERATING**


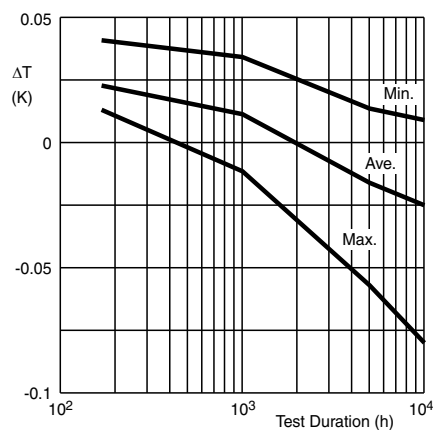
Power derating curve

**Note**

- Zero power is considered as measuring power max. 1 % of max. power

**LONG TERM STABILITY AS A FUNCTION OF TEST DURATION AT MAXIMUM TEMPERATURE (150 °C)**
**TYPICAL  $R_{25}$  STABILITY**


Typical curves valid for 2.2 kΩ to 10 kΩ

**TYPICAL ROOM TEMPERATURE STABILITY**


Typical curves valid for 2.2 kΩ to 10 kΩ



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