NTC Thermistors, Mini Lug Sensors



LINKS TO ADDITIONAL RESOURCES

3D Models | Design Tools | SPICE Models | Related Documents | Capabilities and Custom Options

QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	10K to 47K	Ω
Tolerance on R_{25}-value	± 1 to ± 3	%
$B_{25/85}$-value	3740; 3984	K
Tolerance on $B_{25/85}$-value	± 0.5 to ± 1.5	%
Operating temperature range (without connector)	-55 to +125	°C
Storage temperature range	-55 to +150	°C
Response time for info (1)	2.8	s
Thermal time constant τ_c (2)	1.5	s
Dissipation factor δ (2)	3	mW/K
Max. power dissipation at 55 °C (3)	100	mW
Thermal gradient (4)	0.02	K/K
Minimum dielectric withstanding voltage between terminals and lug	1000	V_{AC}
Minimum insulation resistance between terminals and lug at 500 V_{DC}	100	MΩ
Weight without connector with connector	 ~ 0.5 ~ 0.6	g

Notes

(1) The response time is the time the sensor responds to a 63.2 % step change in temperature, usually set to ΔT = 60 °C (25 to 85) unless mentioned differently. This step is generally conducted by quickly transferring the NTC from one liquid to another (generally water or oil)

(2) Measured with screw mounted on an aluminum heatsink of 100 cm^2, thickness 1.5 mm, in still air at T_{amb} = +25 °C

(3) In still air on an aluminum plate

(4) The thermal gradient is the difference per °C between the true temperature of the surface to be sensed and the temperature measured by the sensor

AGENCY APPROVALS

- cUL certificate XGPU8.E148885
- ULus certificate XGPU2.E148885

Note

- Agency approval documents, please see: www.vishay.com/ppg?29114&documents

PACKAGING

Available in plastic bags.

FEATURES

Pb-free Available

e4

RoHS COMPLIANT

- Fast time response for surface applications compared to industry standard NTC lug sensors
- Reduced thermal gradient, due to the use of small dimensions and nickel conductor, allowing for an accurate surface temperature measurement
- The sensor is not suitable for being permanently in contact with water or liquids
- Small size connector and small lug ring tongue terminal, allowing for temperature sensing at locations where only limited space is available
- Optional connector, rated +85 °C, tin plated (e3)
- AEC-Q200 qualified available (grade 1)
- cULus recognized, file E148885 (UL category XGPU2/XGPU8)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

Thermistors used for surface temperature sensing and control in:

- Computer equipment
- MOSFETS, IC's, power electronics, heatsink temperature control, LED emitter heat-sink control
- Consumer appliances
- Industrial equipment
- Automotive equipment

DESCRIPTION

Miniature insulated chip thermistor with a negative temperature coefficient soldered to AWG#32 silver plated nickel and insulated cables, and mounted inside a mini lug tin plated copper barrel.

CAUTIONS AND WARNINGS ON MOUNTING AND HANDLING

Please read the special instructions:
see www.vishay.com/doc?29221.

- The sensor NTCALUG03A can be mounted by means of a screw M2 (stud #1, #2), or a screw M3 (stud #3, #4) for NTCALUG39A
- For the type without connector, the electrical connection can be made by soldering, crimping, or welding
- For the type with connector, see section Mounting Connector

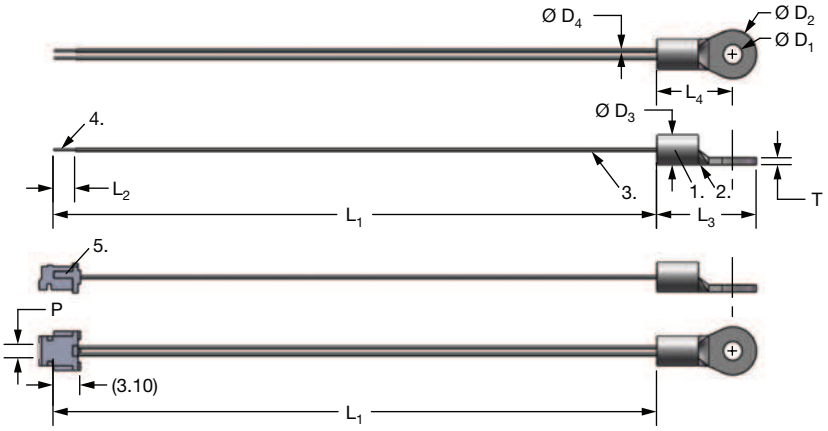
DESIGN-IN SUPPORT

- Other resistance curves and tolerances are available on request
- Consult Vishay for other lead length, other connector crimping, or other features
  https://info.vishay.com/vishay-ntc-modification-request
- 3D solid models: www.vishay.com/doc?29147
- NTC curve computation:
  www.vishay.com/thermistors/ntc-rt-calculator/

For technical questions, contact: nlr@vishay.com

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DIMENSIONS in millimeters



MODEL	L_1	L_2	L_3	L_4	$L_1 + L_3$ (item without connector)	Ø D_1	Ø D_2	Ø D_3	Ø D_4	T	PITCH P
NTCALUG03A	70 ± 5	4 ± 1	11.5 ± 0.5	8.8 ± 0.3	81.5 ± 5	2.2 + 0.2 / - 0	5.5 ± 0.3	3.4 ± 0.3	0.35 ± 0.1	0.8 ± 0.1	1.5 ± 0.3
NTCALUG39A	70 ± 5	4 ± 1	11.5 ± 0.5	8.8 ± 0.3	81.5 ± 5	3.2 + 0.2 / - 0	5.5 ± 0.3	3.4 ± 0.3	0.35 ± 0.1	0.8 ± 0.1	1.5 ± 0.3

Notes

1. Vishay thermistor chip NTC, with epoxy coating
2. Metal ring lug, tin plated
3. Insulated leads: AWG#32, monostranded, diam 0.20 mm, silver plated nickel, ETFE insulated, diameter 0.35 mm
4. End wire stripped
5. 2-poles JST ZHR-2 connector crimped

ELECTRICAL DATA AND ORDERING INFORMATION

R_{25} (Ω)	R_{25}-TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$-TOL. (± %)	DESCRIPTION	UL RECOG. c UL us	SAP MATERIAL AND ORDERING NUMBER	
						RoHS-COMPLIANT WITH EXEMPTION (1)	RoHS-COMPLIANT
10 000	1	3984	0.5	NTC Mini Lug M2 10K 1 % 3984 K 0.5 %	✓	-	NTCALUG03A103FA
10 000	2	3984	0.5	NTC Mini Lug M2 10K 2 % 3984 K 0.5 %	✓	NTCALUG03A103G	NTCALUG03A103GA
10 000	2	3984	0.5	NTC Mini Lug M3 10K 2 % 3984 K 0.5 %	✓	NTCALUG39A103G	NTCALUG39A103GA
10 000	2	3984	0.5	NTC Mini Lug M2 10K 2 % 3984 K 0.5 % with connector	✓	NTCALUG03A103GC	NTCALUG03A103GCA
10 000	2	3984	0.5	NTC Mini Lug M3 10K 2 % 3984 K 0.5 % with connector	✓	NTCALUG39A103GC	NTCALUG39A103GCA
10 000	3	3984	0.5	NTC Mini Lug M2 10K 3 % 3984 K 0.5 %	✓	NTCALUG03A103H	NTCALUG03A103HA
10 000	3	3984	0.5	NTC Mini Lug M2 10K 3 % 3984 K 0.5 % with connector	✓	NTCALUG03A103HC	NTCALUG03A103HCA
12 000	3	3740	1.5	NTC Mini Lug M2 12K 3 %		NTCALUG03A123H	NTCALUG03A123HA
12 000	3	3740	1.5	NTC Mini Lug M2 12K 3 % with connector		NTCALUG03A123HC	NTCALUG03A123HCA
47 000	3	3740	1.5	NTC Mini Lug M2 47K 3 %		NTCALUG03A473H	NTCALUG03A473HA
47 000	3	3740	1.5	NTC Mini Lug M2 47 kΩ 3 % with connector		NTCALUG03A473HC	NTCALUG03A473HCA

Notes

Preferred versions for new designs

(1) 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

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MOUNTING CONNECTOR

- **Important mounting and handling instructions: see** www.vishay.com/doc?29221
- For the type with connector, the JST ZHR-2 connector can mate with following counter-connectors [1]:

A. One of the PCB connector - through hole:
- JST B 2B-ZR (top entry)
- JST S 2B-ZR (side entry)
- JST B 2B-ZR-3.4 (top entry, for 1.6 mm board)
- JST S 2B-ZR-3.4 (side entry, for 1.6 mm board)

B. One of the PCB board connector - SMT surface mount:
- JST S 2B-ZR-SM2-TF (SM2 side entry)
- JST B 2B-ZR-SM3-TF (SM3 top entry)
- JST S 2B-ZR-SM3A-TF (SM3 side entry)
- JST B 2B-ZR-SM4-TF (SM4 top entry)
- JST S 2B-ZR-SM4A-TF (SM4 side entry)

C. The wire-to-wire connector:
- JST ZMR-02 housing (x 1) + JST SMM-003T-P0.5 terminals (x 2)

Note

[1] Additional details and dimensions can be found in JST ZH and JST ZM datasheets

GENERAL ORDER INFORMATION

N	T	C	A	L	U	G	0	3	A	1	0	3	G	a	b	c	C	A

PRODUCT FAMILY	EXECUTION	LUG SIZE AND CABLE TYPE	R_{25} VALUE	TOLERANCE ON R_{25}	OPTIONAL LEAD LENGTH AND B VALUE	CONNECTOR OPTION	RoHS-COMPLIANCE PRODUCT
NTC	**A** = assemblies	**LUG03A** = M2 screw and ETFE AWG32 **LUG39A** = M2 screw and ETFE AWG32	**103** = 10 000 Ω **123** = 12 000 Ω **473**= 47 000 Ω	**F** = ± 1 % **G** = ± 2 % **H** = ± 3 % **J** = ± 5 %	**'abc'** = blank: standard length	**C** = with ZHR-2 connector Blank = without connector	Blank = RoHS-compliant (with exemption) **A** = lead (Pb)-free and RoHS-compliant

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