



## NTC Thermistors, Mini Lug Sensors



### LINKS TO ADDITIONAL RESOURCES



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 <sup>(1)</sup>	2.8	s
Thermal time constant $\tau_c$ <sup>(2)</sup>	1.5	s
Dissipation factor $\delta$ <sup>(2)</sup>	3	mW/K
Max. power dissipation at 55 °C <sup>(3)</sup>	100	mW
Thermal gradient <sup>(4)</sup>	0.02	K/K
Minimum dielectric withstanding voltage between terminals and lug	1000	V <sub>AC</sub>
Minimum insulation resistance between terminals and lug at 500 V <sub>DC</sub>	100	MΩ
Weight		
without connector	~ 0.5	g
with connector	~ 0.6	

#### Notes

- (1) The response time is the time the sensor responds to a 63.2 % step change in temperature, usually set to  $\Delta T = 60$  °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<sup>2</sup>, 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](http://www.vishay.com/ppg?29114&documents)

### PACKAGING

Available in plastic bags.

### FEATURES

- 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](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

### 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.

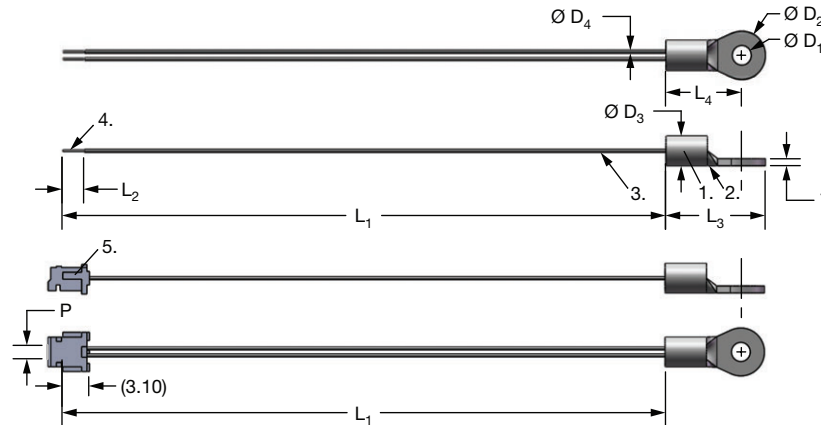
### CAUTIONS AND WARNINGS ON MOUNTING AND HANDLING

Please read the special instructions: see [www.vishay.com/doc?29221](http://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](http://www.vishay.com/doc?29147)
- NTC curve computation: [www.vishay.com/thermistors/ntc-rt-calculator/](http://www.vishay.com/thermistors/ntc-rt-calculator/)

**DIMENSIONS** in millimeters


MODEL	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	L <sub>1</sub> + L <sub>3</sub> (item without connector)	Ø D <sub>1</sub>	Ø D <sub>2</sub>	Ø D <sub>3</sub>	Ø D <sub>4</sub>	T	PITCH P
NTCALUG03A	70 ± 5	4 ± 1	11.5 ± 0.5	8.8 ± 0.3	81.5 ± 5	2.2 ± 0.3	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 ± 0.3	5.5 ± 0.3	3.4 ± 0.3	0.35 ± 0.1	0.8 ± 0.1	1.5 ± 0.3

**Notes**

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

ELECTRICAL DATA AND ORDERING INFORMATION								
R <sub>25</sub> (Ω)	R <sub>25</sub> - TOL. (± %)	B <sub>25/85</sub> (K)	B <sub>25/85</sub> - TOL. (± %)	DESCRIPTION	UL RECOG. 	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



## MOUNTING CONNECTOR

- Important mounting and handling instructions: see [www.vishay.com/doc?29221](http://www.vishay.com/doc?29221)
- For the type with connector, the JST ZHR-2 connector can mate with following counter-connectors <sup>(1)</sup>:
  - 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)
  - 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)
  - The wire-to-wire connector:
    - JST ZMR-02 housing (x 1) + JST SMM-003T-P0.5 terminals (x 2)

### Note

<sup>(1)</sup> Additional details and dimensions can be found in JST ZH and JST ZM datasheets

GENERAL ORDER INFORMATION									
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 $\Omega$ 123 = 12 000 $\Omega$ 473 = 47 000 $\Omega$	F = $\pm 1\%$ G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$	'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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