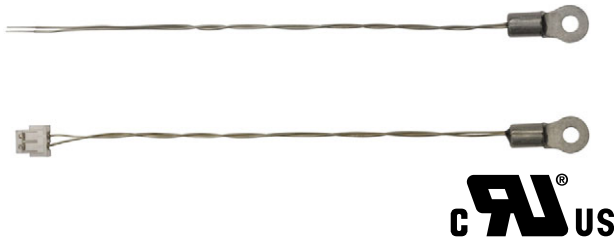




NTC Thermistors, Mini Lug Sensors



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 ⁽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	~ 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 cm², 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

- 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



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.

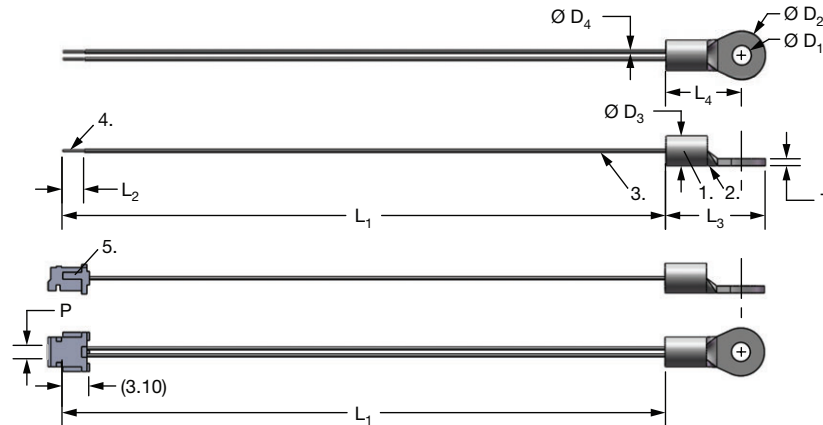
CAUTIONS AND WARNINGS ON MOUNTING AND HANDLING

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

- 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/

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 ± 0.3	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 ₂₅ (Ω)	R ₂₅ - TOL. (± %)	B _{25/85} (K)	B _{25/85} - 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
- For the type with connector, the JST ZHR-2 connector can mate with following counter-connectors ⁽¹⁾:
 - 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

⁽¹⁾ 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 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		



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.