

## NTC Thermistors, Low Thermal Gradient Lug Sensors



### FEATURES

- Thermistor used for surface temperature sensing and control <sup>(1)</sup>
- Good reduced thermal gradient due to the use of nickel conductor and low profile ring tongue
- AEC-Q200 qualified
- Compliant to RoHS directive 2002/95/EC



**RoHS**  
COMPLIANT

QUICK REFERENCE DATA	
PARAMETER	VALUE
Resistance value at 25 °C	4.7 kΩ to 10 kΩ
Tolerance on $R_{25}$ - value	± 1 %, ± 2 %
$B_{25/85}$ value	3984K
Tolerance on $B_{25/85}$ - value	± 0.5 %
Maximum dissipation at 25 °C	100 mW
Thermal time constant $\tau$	≈ 5 s
Dissipation factor	10 mW/K
Operating temperature range at zero power	- 55 °C to 125 °C
Min. dielectric withstanding voltage between terminals and lug	1000 V <sub>AC</sub>
Climatic category (IEC 60539)	55/125/56
Weight	≈ 1.0 g

#### Note

<sup>(1)</sup> Consult Vishay for automotive applications

### PACKAGING

The thermistors are packed in cardboard boxes; the smallest packaging quantity is 250 units.

### MOUNTING

The device is suitable for screwing e.g. on a metal surface through means of an M3 screw. The connections are suitable for soldering on a PCB or for connector insertion. The sensor is not suitable for being in permanent contact with water or liquids.

DIMENSIONS in millimeters						
$L_1$	$L_2$	$\varnothing D_1$	$\varnothing D_2$	$\varnothing D_3$	$L_3$	$T$
45 ± 3	6 ± 1	3.7	8.5	4.1	16.8	0.8

#### Notes

- (2) Vishay thermistor chip NTC with epoxy coating and middle buffer layer
  - (3) Metal ring lug
  - (4) Insulated leads: AWG#30, monostranded,  $\varnothing$  0.254 mm, silver-plated nickel, PEEK insulated (insulation  $\varnothing$  0.56 mm)
- The non dimensioned details do not affect the performance of the device

### DESIGNERS TOOL

- NTC thermistor curve computation (Resistance/ Temperature) is available at: [www.vishay.com/thermistors/curve-computation-list/](http://www.vishay.com/thermistors/curve-computation-list/)
- Other applicable screw size are available, for example stud size metric 3 mm/American 3 to 4.
- 3D or 2D solid models are available. Refer to [www.vishay.com/doc?29106](http://www.vishay.com/doc?29106).
- Other resistance curves and tolerances, e.g. based on 2381 645 2x series, are available on request.
- Other lead length, insulation or connector crimping available on request.
- AWG#28 or AWG#26 wires available on request.

ELECTRICAL DATA AND ORDERING INFORMATION					
$R_{25}$ (kΩ)	$R_{25}$ TOL.	$B_{25/85}$ - VALUE (K)	$B_{25/85}$ TOL.	12NC ORDERING CODE	SAP MATERIAL NO.
4.7	± 2 %	3984	± 0.5 %	-	NTCALUG02A472G
4.7	± 1 %	3984	± 0.5 %	-	NTCALUG02A472F
5	± 2 %	3984	± 0.5 %	-	NTCALUG02A502G
10	± 2 %	3984	± 0.5 %	2381 645 90294	NTCALUG02A103G
10	± 1 %	3984	± 0.5 %	-	NTCALUG02A103F



NTCALUG02A472G	NTC LUG02A 4.7K 2 % 3984K 0.5 %
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RESISTANCE TEMPERATURE CHARACTERISTICS							
TEMP. [°C]	$R(T)/R_{25}$	RESISTANCE [Ω]	$\Delta R/R$ [%]	$\alpha$ [%/K]	$\Delta T$ [K]	$R_{min.}$ [Ω]	$R_{max.}$ [Ω]
-40	33.427	157 109	3.90	- 6.63	0.59	150 982	163 236
-35	24.132	113 422	3.72	- 6.41	0.58	109 206	117 638
-30	17.613	82 782	3.54	- 6.19	0.57	79 851	85714
-25	12.990	61 053	3.37	- 5.99	0.56	58 994	63 112
-20	9.676	45 478	3.21	- 5.79	0.55	44 017	46 938
-15	7.276	34 199	3.06	- 5.61	0.54	33 154	35 244
-10	5.522	25 953	2.91	- 5.43	0.54	25 198	26 707
-5	4.227	19 866	2.76	- 5.26	0.53	19 317	20 415
0	3.262	15 333	2.62	- 5.10	0.51	14 931	15 736
5	2.538	11 929	2.49	- 4.94	0.50	11 632	12 226
10	1.990	9352	2.36	- 4.80	0.49	9131	9572
15	1.571	7384	2.24	- 4.65	0.48	7219	7549
20	1.249	5872	2.12	- 4.52	0.47	5747	5996
25	1.000	4700	2.00	- 4.39	0.46	4606	4794
30	0.806	3786	2.11	- 4.26	0.50	3706	3866
35	0.653	3069	2.22	- 4.14	0.54	3001	3137
40	0.532	2502	2.33	- 4.03	0.58	2444	2560
45	0.437	2052	2.43	- 3.92	0.62	2002	2102
50	0.360	1691	2.53	- 3.81	0.66	1649	1734
55	0.298	1402	2.62	- 3.71	0.71	1365	1438
60	0.248	1167	2.72	- 3.61	0.75	1136	1199
65	0.208	977.0	2.81	- 3.51	0.80	949.6	1004
70	0.175	821.4	2.89	- 3.42	0.85	797.6	845.2
75	0.148	693.7	2.98	- 3.34	0.89	673.0	714.3
80	0.125	588.3	3.06	- 3.25	0.94	570.3	606.4
85	0.107	501.1	3.14	- 3.17	0.99	485.3	516.8
90	0.091	428.4	3.22	- 3.09	1.04	414.7	442.2
95	0.078	367.8	3.30	- 3.02	1.09	355.6	379.9
100	0.067	316.8	3.37	- 2.94	1.14	306.2	327.5
105	0.058	273.9	3.44	- 2.87	1.20	264.5	283.4
110	0.051	237.7	3.51	- 2.81	1.25	229.3	246.0
115	0.044	206.9	3.58	- 2.74	1.31	199.5	214.3
120	0.038	180.7	3.65	- 2.68	1.36	174.1	187.3
125	0.034	158.3	3.71	- 2.62	1.42	152.4	164.1



NTCALUG02A472F	NTC LUG02A 4.7K 1 % 3984K 0.5 %
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RESISTANCE TEMPERATURE CHARACTERISTICS							
TEMP. [°C]	$R_{(T)}/R_{25}$	RESISTANCE [Ω]	$\Delta R/R$ [%]	$\alpha$ [%/K]	$\Delta T$ [K]	$R_{min.}$ [Ω]	$R_{max.}$ [Ω]
-40	33.427	157 109	2.88	- 6.63	0.43	152 582	161 636
-35	24.132	113 422	2.70	- 6.41	0.42	110 359	116 484
-30	17.613	82 782	2.53	- 6.19	0.41	80 691	84 874
-25	12.990	61 053	2.36	- 5.99	0.39	59 612	62 494
-20	9.676	45 478	2.20	- 5.79	0.38	44 477	46 478
-15	7.276	34 199	2.05	- 5.61	0.36	33 500	34 899
-10	5.522	25 953	1.90	- 5.43	0.35	25 460	26 445
-5	4.227	19 866	1.75	- 5.26	0.33	19 517	20 215
0	3.262	15 333	1.62	- 5.10	0.32	15 085	15 581
5	2.538	11 929	1.49	- 4.94	0.30	11 752	12 106
10	1.990	9352	1.36	- 4.80	0.28	9225	9478
15	1.571	7384	1.23	- 4.65	0.27	7293	7475
20	1.249	5872	1.12	- 4.52	0.25	5806	5937
25	1.000	4700	1.00	- 4.39	0.23	4653	4747
30	0.806	3786	1.11	- 4.26	0.26	3744	3828
35	0.653	3069	1.22	- 4.14	0.29	3032	3106
40	0.532	2502	1.32	- 4.03	0.33	2469	2535
45	0.437	2052	1.42	- 3.92	0.36	2022	2081
50	0.360	1691	1.52	- 3.81	0.40	1666	1717
55	0.298	1402	1.62	- 3.71	0.44	1379	1424
60	0.248	1167	1.71	- 3.61	0.47	1147	1187
65	0.208	977.0	1.80	- 3.51	0.51	959.4	994.5
70	0.175	821.4	1.88	- 3.42	0.55	805.9	836.9
75	0.148	693.7	1.97	- 3.34	0.59	680.0	707.3
80	0.125	588.3	2.05	- 3.25	0.63	576.3	600.4
85	0.107	501.1	2.13	- 3.17	0.67	490.4	511.7
90	0.091	428.4	2.21	- 3.09	0.71	419.0	437.9
95	0.078	367.8	2.28	- 3.02	0.76	359.4	376.2
100	0.067	316.8	2.36	- 2.94	0.80	309.4	324.3
105	0.058	273.9	2.43	- 2.87	0.84	267.3	280.6
110	0.051	237.7	2.50	- 2.81	0.89	231.7	243.6
115	0.044	206.9	2.56	- 2.74	0.94	201.6	212.2
120	0.038	180.7	2.63	- 2.68	0.98	175.9	185.4
125	0.034	158.3	2.69	- 2.62	1.03	154.0	162.5



NTCALUG02A502G	NTC LUG02A 5K 2 % 3984K 0.5 %
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RESISTANCE TEMPERATURE CHARACTERISTICS							
TEMP. [°C]	$R(T)/R_{25}$	RESISTANCE [Ω]	$\Delta R/R$ [%]	$\alpha$ [%/K]	$\Delta T$ [K]	$R_{min.}$ [Ω]	$R_{max.}$ [Ω]
-40	33.427	167 137	3.90	- 6.63	0.59	160 619	173 655
-35	24.132	120 661	3.72	- 6.41	0.58	116 177	125 146
-30	17.613	88 066	3.54	- 6.19	0.57	84 947	91 185
-25	12.990	64 950	3.37	- 5.99	0.56	62 759	67 141
-20	9.676	48 381	3.21	- 5.79	0.55	46 827	49 934
-15	7.276	36 382	3.06	- 5.61	0.54	35 270	37 494
-10	5.522	27 609	2.91	- 5.43	0.54	26 807	28 411
-5	4.227	21 134	2.76	- 5.26	0.53	20 550	21 718
0	3.262	16 312	2.62	- 5.10	0.51	15 884	16 740
5	2.538	12 691	2.49	- 4.94	0.50	12 375	13 007
10	1.990	9948	2.36	- 4.80	0.49	9714	10 183
15	1.571	7856	2.24	- 4.65	0.48	7680	8031
20	1.249	6246	2.12	- 4.52	0.47	6114	6379
25	1.000	5000	2.00	- 4.39	0.46	4900	5100
30	0.806	4028	2.11	- 4.26	0.50	3943	4113
35	0.653	3265	2.22	- 4.14	0.54	3192	3337
40	0.532	2662	2.33	- 4.03	0.58	2600	2724
45	0.437	2183	2.43	- 3.92	0.62	2130	2236
50	0.360	1799	2.53	- 3.81	0.66	1754	1845
55	0.298	1491	2.62	- 3.71	0.71	1452	1530
60	0.248	1242	2.72	- 3.61	0.75	1208	1276
65	0.208	1039	2.81	- 3.51	0.80	1010	1068
70	0.175	873.8	2.89	- 3.42	0.85	848.5	899.1
75	0.148	738.0	2.98	- 3.34	0.89	716.0	759.9
80	0.125	625.9	3.06	- 3.25	0.94	606.7	645.1
85	0.107	533.1	3.14	- 3.17	0.99	516.3	549.8
90	0.091	455.8	3.22	- 3.09	1.04	441.1	470.5
95	0.078	391.2	3.30	- 3.02	1.09	378.3	404.1
100	0.067	337.1	3.37	- 2.94	1.14	325.7	348.4
105	0.058	291.4	3.44	- 2.87	1.20	281.4	301.5
110	0.051	252.8	3.51	- 2.81	1.25	244.0	261.7
115	0.044	220.1	3.58	- 2.74	1.31	212.2	228.0
120	0.038	192.2	3.65	- 2.68	1.36	185.2	199.2
125	0.034	168.4	3.71	- 2.62	1.42	162.1	174.6

NTCALUG02A103G	NTC LUG02A 10K 2 % 3984K 0.5 %
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RESISTANCE TEMPERATURE CHARACTERISTICS							
TEMP. [°C]	$R_{(T)}/R_{25}$	RESISTANCE [Ω]	$\Delta R/R$ [%]	$\alpha$ [%/K]	$\Delta T$ [K]	$R_{min.}$ [Ω]	$R_{max.}$ [Ω]
-40	33.427	334 274	3.90	- 6.63	0.59	321 238	347 311
-35	24.132	241 323	3.72	- 6.41	0.58	232 353	250 293
-30	17.613	176 133	3.54	- 6.19	0.57	169 895	182 370
-25	12.990	129 900	3.37	- 5.99	0.56	125 518	134 282
-20	9.676	96 761	3.21	- 5.79	0.55	93 654	99 869
-15	7.276	72 765	3.06	- 5.61	0.54	70 541	74 988
-10	5.522	55 218	2.91	- 5.43	0.54	53 613	56 823
-5	4.227	42 268	2.76	- 5.26	0.53	41 100	43 435
0	3.262	32 624	2.62	- 5.10	0.51	31 768	33 480
5	2.538	25 381	2.49	- 4.94	0.50	24 749	26 013
10	1.990	19 897	2.36	- 4.80	0.49	19 427	20 367
15	1.571	15 711	2.24	- 4.65	0.48	15 360	16 063
20	1.249	12 493	2.12	- 4.52	0.47	12 228	12 757
25	1.000	10 000	2.00	- 4.39	0.46	9800	10 200
30	0.806	8056	2.11	- 4.26	0.50	7886	8226
35	0.653	6530	2.22	- 4.14	0.54	6385	6675
40	0.532	5324	2.33	- 4.03	0.58	5200	5448
45	0.437	4365	2.43	- 3.92	0.62	4259	4471
50	0.360	3599	2.53	- 3.81	0.66	3508	3690
55	0.298	2982	2.62	- 3.71	0.71	2904	3060
60	0.248	2484	2.72	- 3.61	0.75	2416	2551
65	0.208	2079	2.81	- 3.51	0.80	2020	2137
70	0.175	1748	2.89	- 3.42	0.85	1697	1798
75	0.148	1476	2.98	- 3.34	0.89	1432	1520
80	0.125	1252	3.06	- 3.25	0.94	1213	1290
85	0.107	1066	3.14	- 3.17	0.99	1033	1100
90	0.091	911.6	3.22	- 3.09	1.04	882.2	940.9
95	0.078	782.5	3.30	- 3.02	1.09	756.7	808.2
100	0.067	674.1	3.37	- 2.94	1.14	651.4	696.8
105	0.058	582.8	3.44	- 2.87	1.20	562.8	602.9
110	0.051	505.7	3.51	- 2.81	1.25	487.9	523.4
115	0.044	440.2	3.58	- 2.74	1.31	424.4	455.9
120	0.038	384.4	3.65	- 2.68	1.36	370.4	398.4
125	0.034	336.7	3.71	- 2.62	1.42	324.2	349.2



NTCALUG02A103F	NTC LUG02A 10K 1 % 3984K 0.5 %
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RESISTANCE TEMPERATURE CHARACTERISTICS							
TEMP. [°C]	$R_{(T)}/R_{25}$	RESISTANCE [Ω]	$\Delta R/R$ [%]	$\alpha$ [%/K]	$\Delta T$ [K]	$R_{min.}$ [Ω]	$R_{max.}$ [Ω]
-40	33.427	334 274	2.88	- 6.63	0.43	324 643	343 906
-35	24.132	241 323	2.70	- 6.41	0.42	234 807	247 839
-30	17.613	176 133	2.53	- 6.19	0.41	171 683	180 582
-25	12.990	129 900	2.36	- 5.99	0.39	126 835	132 965
-20	9.676	96 761	2.20	- 5.79	0.38	94 633	98 889
-15	7.276	72 765	2.05	- 5.61	0.36	71 276	74 253
-10	5.522	55 218	1.90	- 5.43	0.35	54 170	56 266
-5	4.227	42 268	1.75	- 5.26	0.33	41 526	43 010
0	3.262	32 624	1.62	- 5.10	0.32	32 096	33 152
5	2.538	25 381	1.49	- 4.94	0.30	25 004	25 758
10	1.990	19 897	1.36	- 4.80	0.28	19 627	20 167
15	1.571	15 711	1.23	- 4.65	0.27	15 517	15 905
20	1.249	12 493	1.12	- 4.52	0.25	12 353	12 632
25	1.000	10 000	1.00	- 4.39	0.23	9900	10 100
30	0.806	8056	1.11	- 4.26	0.26	7966	8145
35	0.653	6530	1.22	- 4.14	0.29	6450	6609
40	0.532	5324	1.32	- 4.03	0.33	5253	5394
45	0.437	4365	1.42	- 3.92	0.36	4303	4427
50	0.360	3599	1.52	- 3.81	0.40	3544	3653
55	0.298	2982	1.62	- 3.71	0.44	2934	3030
60	0.248	2484	1.71	- 3.61	0.47	2441	2526
65	0.208	2079	1.80	- 3.51	0.51	2041	2116
70	0.175	1748	1.88	- 3.42	0.55	1715	1781
75	0.148	1476	1.97	- 3.34	0.59	1447	1505
80	0.125	1252	2.05	- 3.25	0.63	1226	1277
85	0.107	1066	2.13	- 3.17	0.67	1043	1089
90	0.091	911.6	2.21	- 3.09	0.71	891.5	931.7
95	0.078	782.5	2.28	- 3.02	0.76	764.6	800.3
100	0.067	674.1	2.36	- 2.94	0.80	658.2	690.0
105	0.058	582.8	2.43	- 2.87	0.84	568.7	597.0
110	0.051	505.7	2.50	- 2.81	0.89	493.0	518.3
115	0.044	440.2	2.56	- 2.74	0.94	428.9	451.5
120	0.038	384.4	2.63	- 2.68	0.98	374.3	394.5
125	0.034	336.7	2.69	- 2.62	1.03	327.7	345.8



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