NTC Thermistors, 2-Point Micro Chip Sensor Insulated Leads

FEATURES

- Flexible insulated leads for special mounting or assembly
- Miniature sized very fast reacting
- Accurate over a wide temperature range
- High stability over a long life
- Exceptional withstanding in thermal shocks
- AEC-Q200 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Fulfils the ELV 2000/53/EC

AUTOMOTIVE GRADE

RoHS COMPLIANT

APPLICATIONS

- Temperature measurement, sensing and control in automotive and industrial applications

DESCRIPTION

These negative temperature coefficient thermistors consist of a micro NTC chip with two insulated solid silver plated nickel wires and coated with a ochre-colored epoxy lacquer.

PACKAGING

The thermistors are packed in cardboard boxes; the smallest packing quantity is 1000 pieces.

MARKING

The components are not marked.

DESIGN-IN SUPPORT

R(T) tables spreadsheet available on request at nlr@vishay.com.

MOUNTING

By soldering or welding in any position.
The parts can be potted in suitable resins.

QUICK REFERENCE DATA

PARAMETER	VALUE	UNIT
Resistance value at 25 °C	2.06K to 10K	Ω
Tolerance on R_{25}-value	± 1.92; ± 2.19	%
$B_{25/85}$-value	3511 to 3984	K
Tolerance on $B_{25/85}$	± 0.5 to ± 1	%
Accuracy of temperature measurement	± 0.5 between 25 and 85	°C
Operating temperature range	- 40 to + 125	°C
Maximum power dissipation at 55 °C	50	mW
Dissipation factor δ (in still air)	≈ 0.8	mW/K
Response time (in stirred air) (in oil)	≈ 3 ≈ 0.7	s
Climatic category (LCT/UCT/days)	40/125/56	
Minimum dielectric withstanding voltage between leads termination and coated body	100	V_{RMS}
Weight	≈ 0.05	g

ELECTRICAL DATA AND ORDERING INFORMATION

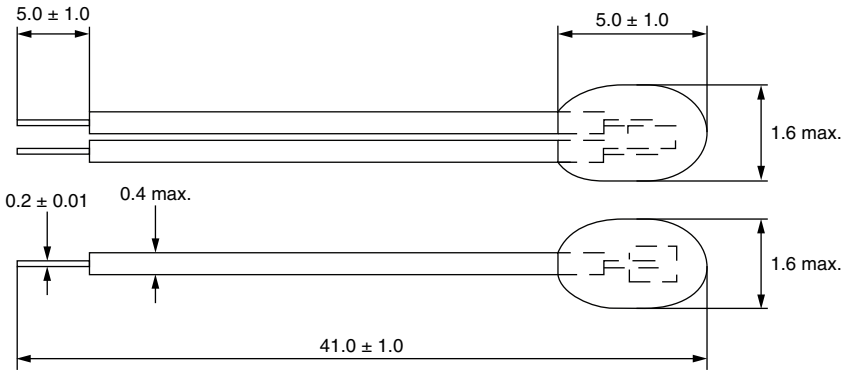
SAP PART AND ORDERING NUMBER	R_{25} (1) (Ω)	α (25 °C) (%/K)	R_{25} TOL. (%)	$B_{25/85}$ (1) (K)	$B_{25/85}$ TOL. (%)	$\Delta T_{MAX.}$ (2) 25 TO 85 (°C)
NTCLE305E4202SB	2060	- 3.85	1.92	3511	1.0	± 0.5
NTCLE305E4502SB	5000	- 4.39	2.19	3984	0.5	± 0.5
NTCLE305E4103SB	10 000	- 4.39	2.19	3984	0.5	± 0.5

Notes

(1) Other R_{25} and B-values available on request

(2) ΔT is the temperature measurement accuracy in the defined temperature range

DIMENSIONS in millimeters



RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 2060 Ω							
SAP PART AND ORDERING NUMBER: NTCLE305E4202SB							
TEMPERATURE (°C)	RESISTANCE (Ω)	R/R_{25}	$\Delta R/R$ (%)	α (%/K)	$\Delta T_{MAX.}$ (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
- 40.0	47 326	22.974	5.27	- 6.03	0.87	44 832	49 820
- 35.0	35 203	17.089	4.95	- 5.81	0.85	33 461	36 945
- 30.0	26 473	12.851	4.64	- 5.60	0.83	25 245	27 700
- 25.0	20 115	9.7643	4.34	- 5.39	0.81	19 241	20 988
- 20.0	15 435	7.4925	4.06	- 5.20	0.78	14 808	16 061
- 15.0	11 954	5.8031	3.78	- 5.02	0.75	11 502	12 407
- 10.0	9341.4	4.5347	3.52	- 4.85	0.73	9012.6	9670.2
- 5.0	7361.4	3.5735	3.27	- 4.68	0.70	7120.9	7601.8
0.0	5847.7	2.8387	3.02	- 4.53	0.67	5671.0	6024.5
5.0	4680.9	2.2723	2.79	- 4.38	0.64	4550.5	4811.4
10.0	3774.3	1.8322	2.56	- 4.24	0.60	3677.7	3870.9
15.0	3064.4	1.4876	2.34	- 4.10	0.57	2992.7	3136.2
20.0	2504.6	1.2158	2.13	- 3.97	0.54	2451.3	2557.9
25.0	2060.0	1.0000	1.92	- 3.85	0.50	2020.4	2099.6
30.0	1704.5	0.82744	1.86	- 3.73	0.50	1672.7	1736.3
35.0	1418.6	0.68864	1.81	- 3.62	0.50	1392.9	1444.3
40.0	1186.9	0.57618	1.76	- 3.52	0.50	1166.1	1207.8
45.0	997.97	0.48445	1.71	- 3.42	0.50	980.90	1015.0
50.0	842.90	0.40917	1.67	- 3.33	0.50	828.85	856.95
55.0	714.92	0.34705	1.63	- 3.25	0.50	703.29	726.55
60.0	608.74	0.29550	1.59	- 3.18	0.50	599.06	618.41
65.0	520.21	0.25253	1.55	- 3.11	0.50	512.13	528.30
70.0	446.08	0.21654	1.52	- 3.04	0.50	439.29	452.86
75.0	383.73	0.18628	1.49	- 2.98	0.50	378.01	389.45
80.0	331.09	0.16072	1.46	- 2.92	0.50	326.25	335.93
85.0	286.48	0.13907	1.43	- 2.87	0.50	282.37	290.59
90.0	248.55	0.12065	1.57	- 2.81	0.56	244.64	252.45
95.0	216.18	0.10494	1.70	- 2.77	0.62	212.50	219.87
100.0	188.49	0.091501	1.83	- 2.72	0.67	185.04	191.95
105.0	164.73	0.079964	1.96	- 2.67	0.73	161.50	167.95
110.0	144.27	0.070036	2.08	- 2.63	0.79	141.27	147.28
115.0	126.63	0.061470	2.20	- 2.59	0.85	123.84	129.42
120.0	111.36	0.054061	2.32	- 2.55	0.91	108.78	113.95
125.0	98.133	0.047637	2.43	- 2.51	0.97	95.746	100.52

Note

- *R*(T) table spreadsheet available on request at nlr@vishay.com

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 5 kΩ							
SAP PART AND ORDERING NUMBER: NTCLE305E4502SB							
TEMPERATURE (°C)	RESISTANCE (Ω)	R/R_{25}	$\Delta R/R$ (%)	α (%/K)	$\Delta T_{MAX.}$ (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
- 40	167 137	33.427	4.10	- 6.63	0.62	160 290	173 984
- 35	120 661	24.132	3.91	- 6.41	0.61	115 939	125 383
- 30	88 066	17.613	3.74	- 6.19	0.60	84 775	91 358
- 25	64 950	12.990	3.57	- 5.99	0.60	62 632	67 268
- 20	48 381	9.6761	3.41	- 5.79	0.59	46 732	50 029
- 15	36 382	7.2765	3.25	- 5.61	0.58	35 199	37 565
- 10	27 609	5.5218	3.10	- 5.43	0.57	26 753	28 465
- 5	21 134	4.2268	2.96	- 5.26	0.56	20 509	21 759
0	16 312	3.2624	2.82	- 5.10	0.55	15 852	16 772
5	12 691	2.5381	2.68	- 4.94	0.54	12 350	13 031
10	9948.4	1.9897	2.55	- 4.80	0.53	9694.3	10 203
15	7855.6	1.5711	2.43	- 4.65	0.52	7664.7	8046.5
20	6246.4	1.2493	2.31	- 4.52	0.51	6102.1	6390.6
25	5000.0	1.0000	2.19	- 4.39	0.50	4890.3	5109.7
30	4028.0	0.80560	2.13	- 4.26	0.50	3942.2	4113.8
35	3264.9	0.65297	2.07	- 4.14	0.50	3197.3	3332.5
40	2661.9	0.53239	2.01	- 4.03	0.50	2608.4	2715.5
45	2182.6	0.43653	1.96	- 3.92	0.50	2139.9	2225.4
50	1799.4	0.35987	1.90	- 3.81	0.50	1765.1	1833.6
55	1491.1	0.29823	1.85	- 3.71	0.50	1463.5	1518.8
60	1241.9	0.24838	1.80	- 3.61	0.50	1219.5	1264.3
65	1039.3	0.20787	1.76	- 3.51	0.50	1021.1	1057.6
70	873.83	0.17477	1.71	- 3.42	0.50	858.87	888.79
75	737.96	0.14759	1.67	- 3.34	0.50	725.65	750.27
80	625.90	0.12518	1.63	- 3.25	0.50	615.72	636.08
85	533.05	0.10661	1.59	- 3.17	0.50	524.60	541.51
90	455.79	0.091159	1.66	- 3.09	0.54	448.21	463.37
95	391.23	0.078246	1.74	- 3.02	0.58	384.43	398.03
100	337.06	0.067411	1.81	- 2.94	0.62	330.95	343.16
105	291.42	0.058284	1.88	- 2.87	0.66	285.93	296.91
110	252.84	0.050568	1.95	- 2.81	0.70	247.90	257.78
115	220.09	0.044019	2.02	- 2.74	0.74	215.64	224.54
120	192.21	0.038441	2.09	- 2.68	0.78	188.19	196.22
125	168.37	0.033675	2.15	- 2.62	0.82	164.75	172.00

Note

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RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 10 kΩ							
SAP PART AND ORDERING NUMBER: NTCLE305E4103SB							
TEMPERATURE (°C)	RESISTANCE (Ω)	R/R_{25}	$\Delta R/R$ (%)	α (%/K)	$\Delta T_{MAX.}$ (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
- 40	334 274	33.427	4.10	- 6.63	0.62	320 580	347 969
- 35	241 323	24.132	3.91	- 6.41	0.61	231 879	250 767
- 30	176 133	17.613	3.74	- 6.19	0.60	169 549	182 716
- 25	129 900	12.990	3.57	- 5.99	0.60	125 264	134 536
- 20	96 761	9.6761	3.41	- 5.79	0.59	93 465	100 058
- 15	72 765	7.2765	3.25	- 5.61	0.58	70 399	75 130
- 10	55 218	5.5218	3.10	- 5.43	0.57	53 506	56 931
- 5	42 268	4.2268	2.96	- 5.26	0.56	41 018	43 518
0	32 624	3.2624	2.82	- 5.10	0.55	31 705	33 544
5	25 381	2.5381	2.68	- 4.94	0.54	24 700	26 063
10	19 897	1.9897	2.55	- 4.80	0.53	19 389	20 405
15	15 711	1.5711	2.43	- 4.65	0.52	15 329	16 093
20	12 493	1.2493	2.31	- 4.52	0.51	12 204	12 781
25	10 000	1.0000	2.19	- 4.39	0.50	9780.7	10 219
30	8056.0	0.80560	2.13	- 4.26	0.50	7884.3	8227.6
35	6529.7	0.65297	2.07	- 4.14	0.50	6394.5	6664.9
40	5323.9	0.53239	2.01	- 4.03	0.50	5216.7	5431.1
45	4365.3	0.43653	1.96	- 3.92	0.50	4279.8	4450.7
50	3598.7	0.35987	1.90	- 3.81	0.50	3530.2	3667.3
55	2982.3	0.29823	1.85	- 3.71	0.50	2927.0	3037.6
60	2483.8	0.24838	1.80	- 3.61	0.50	2439.0	2528.6
65	2078.7	0.20787	1.76	- 3.51	0.50	2042.1	2115.2
70	1747.7	0.17477	1.71	- 3.42	0.50	1717.7	1777.6
75	1475.9	0.14759	1.67	- 3.34	0.50	1451.3	1500.5
80	1251.8	0.12518	1.63	- 3.25	0.50	1231.4	1272.2
85	1066.1	0.10661	1.59	- 3.17	0.50	1049.2	1083.0
90	911.59	0.091159	1.66	- 3.09	0.54	896.42	926.75
95	782.46	0.078246	1.74	- 3.02	0.58	768.85	796.06
100	674.11	0.067411	1.81	- 2.94	0.62	661.89	686.33
105	582.84	0.058284	1.88	- 2.87	0.66	571.86	593.83
110	505.68	0.050568	1.95	- 2.81	0.70	495.79	515.56
115	440.19	0.044019	2.02	- 2.74	0.74	431.28	449.09
120	384.41	0.038441	2.09	- 2.68	0.78	376.38	392.44
125	336.75	0.033675	2.15	- 2.62	0.82	329.50	344.00

Note

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