NTC Thermistors, 2-Point Micro Chip Sensor Insulated Leads

DESIGN SUPPORT TOOLS AVAILABLE

3D Models Design Tools

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
- Fulfills the ELV 2000/53/EC
- RoHS compliant, available with or without exemptions
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

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	%
Temperature accuracy between 25 °C and 85 °C	± 0.5	°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
Minimum dielectric withstanding voltage between leads termination and coated body	100	V_{RMS}
Weight	≈ 0.05	g

APPLICATIONS

Temperature measurement, sensing and control in automotive and industrial applications

DESCRIPTION

These thermistors consist of a micro NTC ceramic chip soldered between two ETFE insulated AWG #32 solid silver plated nickel leads. The thermistor body is coated with a ocher colored insulating lacquer.

PACKAGING

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

MARKING

The components are not marked.

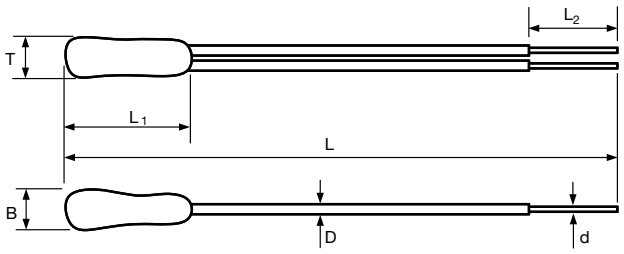
DESIGN-IN SUPPORT

For complete curve computation, please visit: www.vishay.com/thermistors/ntc-curve-list/.

MOUNTING

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

DIMENSIONS in millimeters



$T_{MAX.}$	$B_{MAX.}$	L	L_1	L_2	Ø $D_{MAX.}$	Ø d
1.6	1.6	41.0 ± 1	5.0 ± 1	5.0 ± 1	0.40	0.20 ± 0.01

ELECTRICAL DATA AND ORDERING INFORMATION

R_{25} (1) (Ω)	R_{25}-TOL. (± %)	$B_{25/85}$ (1) (K)	$B_{25/85}$-TOL. (± %)	SAP PART AND ORDERING NUMBER RoHS COMPLIANT WITH EXEMPTIONS	SAP PART AND ORDERING NUMBER RoHS COMPLIANT WITHOUT EXEMPTIONS
2060	1.92	3511	1.0	NTCLE305E4202SB	NTCLE305E4202SBA
5000	2.19	3984	0.5	NTCLE305E4502SB	NTCLE305E4502SBA
10 000	2.19	3984	0.5	NTCLE305E4103SB	NTCLE305E4103SBA

Note

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

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 2060 Ω							
SAP PART AND ORDERING NUMBER: NTCLE305E4202SB							
TEMPERATURE (°C)	RESISTANCE (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °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

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES WITH R_{25} AT 5 kΩ							
SAP PART AND ORDERING NUMBER: NTCLE305E4502SB							
TEMPERATURE (°C)	RESISTANCE (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °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

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

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