

## NTC Thermistors, Molded Range



### FEATURES

- Excellent for surface temperature measurement
- Designed for harsh environments
- Based on the "2322 640 0..." naked thermistor chips.
- Old part number was 2322 641 6...
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

### APPLICATIONS

- Temperature control.

QUICK REFERENCE DATA	
PARAMETER	VALUE
Resistance value at 25 °C (R <sub>25</sub> )	2.2 to 470 kΩ
Tolerance on R <sub>25</sub> - value	± 2 %, ± 3 %, ± 5 %, ± 10 %
B <sub>25/85</sub> - values	3740 to 4570 K
Maximum dissipation	250 mW
Response time	≈ 2.7 s
Operating temperature range: at zero dissipation at maximum dissipation	- 40 to + 125 °C 0 to 55 °C
Minimum dielectric withstanding voltage (RMS) between leads and lead insulation	350 V
Minimum insulation resistance between leads and lead insulation at 100 V (DC)	100 MΩ
Climatic category	40/125/56
Mass	≈ 0.3 g

These thermistors have a negative temperature coefficient. The device consists of a moulded chip with two tin-plated solid nickel leads. The body color is white and the device is non-flammable.

### PACKAGING

The smallest packing quantity is 500 units.

### MARKING

White colored body.

### MOUNTING

By soldering in any position or mechanical fixing.

ELECTRICAL DATA AND ORDERING INFORMATION												
R <sub>25</sub> (kΩ)	TC (%/K)	MASS (g)	W (mm)	H (mm)	L (mm)	P (mm)	T (mm)	D (mm)	B <sub>25/85</sub>		12 NC 2381 641 ..... <sup>(2)</sup>	SAP PART NO. NTCLM101E3 <sup>(3)</sup>
									K	TOL. (%)		
2.2	- 4.37	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	3977	± 0.75	6.222	222*B0
2.7	- 4.37	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	3977	± 0.75	6.272	272*B0
12	- 4.10	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	3740	± 2.0	6.123	123*B0
15	- 4.10	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	3740	± 2.0	6.153	153*B0
33	- 4.46	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	4090	± 1.5	6.333	333*B0
100	- 4.57	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	4190	± 1.5	6.104	104*B0
470	- 4.95	≈ 0.3	4 ± 0.2	4.4 ± 0.2	21 ± 1	2.54 ± 0.3	2.5 ± 0.2	0.6 ± 0.15	4570	± 1.5	6.474	474*B0

#### Note

1. R<sub>25</sub> - values, TC, mass, dimensions and catalog numbers.
  - a) Other R<sub>25</sub> - values are available on request.
2. Replace dot in the code numbers by one of the following, depending on required R<sub>25</sub> - value:
  - 4 for a tolerance of ± 2 %
  - 6 for a tolerance of ± 3 %
  - 3 for a tolerance of ± 5 %
  - 2 for a tolerance of ± 10 %
3. Replace \* by G for a tolerance of 2 %, H for 3 %, J for 5 % and K for 10 %

**DIMENSIONS** in millimeters

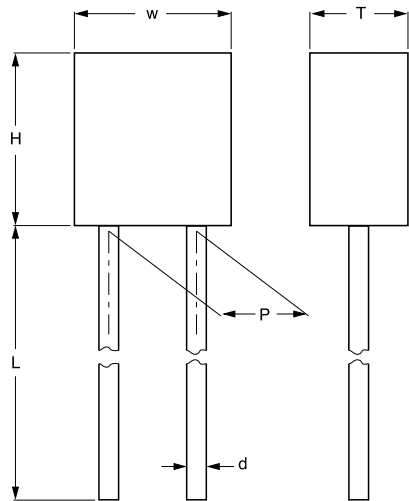
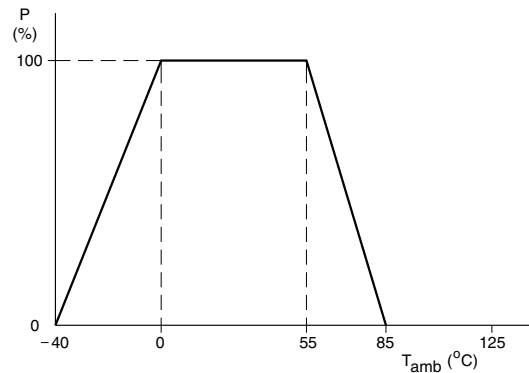


Fig.1 Component outline.

**DERATING**



Power derating curve.

For dimensions see Electrical Data and Ordering Information Table

<b>RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES</b>					
T <sub>OPER</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)	
				2381 641 ..... <sup>(1)</sup>	
				6.222	6.272
-40	33.21	2.66	-6.57	73 062	89 667
-35	23.99	2.41	-6.36	52 779	64 774
-30	17.52	2.17	-6.15	38 545	47 305
-25	12.93	1.94	-5.95	28 444	34 908
-20	9.636	1.71	-5.76	21 199	26 017
-15	7.250	1.50	-5.58	15 950	19 575
-10	5.505	1.29	-5.40	12 110	14 863
-5	4.216	1.08	-5.24	9275	11 383
0	3.255	0.89	-5.08	7162	8790
5	2.534	0.70	-4.92	5575	6842
10	1.987	0.52	-4.78	4372	5366
15	1.570	0.34	-4.64	3454	4239
20	1.249	0.17	-4.50	2747	3372
25	1.000	0.00	-4.37	2200	2700
30	0.8059	0.16	-4.25	1773	2176
35	0.6535	0.32	-4.13	1438	1764
40	0.5330	0.47	-4.02	1173	1439
45	0.4372	0.62	-3.91	961.8	1180
50	0.3605	0.77	-3.80	793.2	973.4
55	0.2989	0.91	-3.70	657.5	807.0
60	0.2490	1.05	-3.60	547.8	672.3
65	0.2084	1.18	-3.51	458.6	562.8
70	0.1753	1.31	-3.42	385.7	473.3
75	0.1481	1.44	-3.33	325.8	399.9
80	0.1256	1.57	-3.25	276.4	339.2
85	0.1070	1.69	-3.16	235.5	289.0
90	0.09154	1.81	-3.09	201.4	247.2
95	0.07860	1.93	-3.01	172.9	212.2
100	0.06773	2.04	-2.94	149.0	182.9
105	0.05858	2.15	-2.87	128.9	158.2
110	0.05083	2.26	-2.80	111.8	137.2
115	0.04426	2.37	-2.73	97.37	119.5
120	0.03866	2.47	-2.67	85.05	104.4
125	0.03387	2.57	-2.61	74.52	91.46



RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES					
T <sub>OPER</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)	
				2381 641 ..... <sup>(1)</sup>	
				6.123	6.153
- 40	25.78	6.81	- 6.09	309 403	386 754
- 35	19.13	6.16	- 5.89	229 509	286 887
- 30	14.32	5.53	- 5.70	171 844	214 805
- 25	10.82	4.93	- 5.52	129 828	162 285
- 20	8.245	4.35	- 5.35	98 935	123 669
- 15	6.335	3.80	- 5.19	76 020	95 025
- 10	4.907	3.26	- 5.03	58 880	73 600
- 5	3.830	2.74	- 4.88	45 954	57 443
0	3.011	2.24	- 4.73	36 130	45 163
5	2.384	1.76	- 4.60	28 607	35 759
10	1.900	1.30	- 4.46	22 805	28 506
15	1.525	0.85	- 4.34	18 298	22 872
20	1.231	0.42	- 4.21	14 774	18 467
25	1.000	0.00	- 4.10	12 000	15 000
30	0.8171	0.41	- 3.98	9804	12 255
35	0.6712	0.80	- 3.88	8054	10 068
40	0.5543	1.19	- 3.77	6652	8315
45	0.4602	1.57	- 3.67	5522	6903
50	0.3839	1.94	- 3.57	4607	5759
55	0.3219	2.30	- 3.48	3862	4828
60	0.2710	2.65	- 3.39	3252	4066
65	0.2293	2.99	- 3.30	2751	3439
70	0.1947	3.33	- 3.22	2337	2921
75	0.1661	3.66	- 3.14	1993	2492
80	0.1422	3.98	- 3.06	1707	2134
85	0.1223	4.29	- 2.99	1467	1834
90	0.1055	4.60	- 2.92	1266	1583
95	0.09135	4.90	- 2.85	1096	1370
100	0.07937	5.19	- 2.78	952.2	1190
105	0.06919	5.48	- 2.71	830.2	1038
110	0.06050	5.76	- 2.65	726.0	907.5
115	0.05307	6.04	- 2.59	636.9	796.1
120	0.04670	6.31	- 2.53	560.4	700.5
125	0.04121	6.57	- 2.47	494.5	618.1

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES					
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				2381 641 ..... <sup>(1)</sup>	
				6.104	
- 40	36.66	5.69	- 6.70	3 666 321	
- 35	26.38	5.15	- 6.49	2 637 604	
- 30	19.17	4.63	- 6.29	1 916 588	
- 25	14.06	4.13	- 6.10	1 406 120	
- 20	10.41	3.65	- 5.92	1 041 190	
- 15	7.779	3.18	- 5.74	777 851	
- 10	5.861	2.73	- 5.57	586 100	
- 5	4.453	2.30	- 5.41	445 260	
0	3.409	1.88	- 5.26	340 944	
5	2.631	1.48	- 5.11	263 055	
10	2.044	1.09	- 4.97	204 447	
15	1.600	0.72	- 4.83	160 015	
20	1.261	0.35	- 4.70	126 087	
25	1.000	0.00	- 4.57	100 000	

**RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES**

T <sub>OPER</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2381 641 ..... <sup>(1)</sup>
				6.104
30	0.7981	0.34	- 4.45	79 808
35	0.6408	0.67	- 4.35	64 077
40	0.5175	1.00	- 4.22	51 746
45	0.4202	1.32	- 4.11	42 021
50	0.3431	1.63	- 4.00	34 308
55	0.2816	1.93	- 3.90	28 156
60	0.2322	2.22	- 3.80	23 223
65	0.1925	2.51	- 3.71	19 246
70	0.1602	2.79	- 3.62	16 025
75	0.1340	3.06	- 3.53	13 402
80	0.1126	3.33	- 3.45	11 258
85	0.09496	3.59	- 3.36	9496
90	0.08042	3.85	- 3.28	8042
95	0.06837	4.10	- 3.21	6837
100	0.05835	4.35	- 3.13	5835
105	0.04998	4.59	- 3.06	4998
110	0.04296	4.82	- 2.99	4296
115	0.03705	5.05	- 2.92	3705
120	0.03206	5.28	- 2.86	3206
125	0.02783	5.50	- 2.80	2783

**RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES**

T <sub>OPER</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2381 641 ..... <sup>(1)</sup>
				6.474
- 40	48.62	6.22	- 7.13	22 849 885
- 35	34.19	5.63	- 6.91	16 068 156
- 30	24.28	5.06	- 6.71	11 412 861
- 25	17.42	4.51	- 6.52	8 185 271
- 20	12.61	3.98	- 6.33	5 925 780
- 15	9.211	3.47	- 6.15	4 329 092
- 10	6.788	2.98	- 5.98	3 190 465
- 5	5.045	2.51	- 5.82	2 371 302
0	3.781	2.06	- 5.66	1 776 920
5	2.855	1.62	- 5.50	1 342 065
10	2.173	1.19	- 5.36	1 021 372
15	1.666	0.78	- 5.22	783 037
20	1.286	0.38	- 5.08	604 583
25	1.000	0.00	- 4.95	470 000
30	0.7825	0.37	- 4.82	367 792
35	0.6163	0.74	- 4.70	289 646
40	0.4883	1.09	- 4.59	229 509
45	0.3892	1.44	- 4.47	182 938
50	0.3120	1.77	- 4.36	146 652
55	0.2515	2.10	- 4.26	118 215
60	0.2038	2.43	- 4.15	95 801
65	0.1660	2.74	- 4.06	78 037
70	0.1359	3.05	- 3.96	63 884
75	0.1118	3.35	- 3.87	52 549
80	0.09240	3.64	- 3.78	43 427
85	0.07670	3.93	- 3.69	30 055
90	0.06395	4.21	- 3.61	25 163
95	0.05354	4.48	- 3.53	21 153
100	0.04501	4.75	- 3.45	17 852
105	0.03798	5.01	- 3.37	15 123



<b>RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES</b>				
T <sub>OPER</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2381 641 ..... <sup>(1)</sup>
				6.474
110	0.03218	5.27	- 3.30	12 859
115	0.02736	5.52	- 3.23	10 973
120	0.02335	5.77	- 3.16	9396
125	0.01999	6.01	- 3.09	9325

<b>RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES</b>				
T <sub>OPER</sub> (°C)	R <sub>T</sub> /R <sub>25</sub>	ΔR DUE TO B-TOLERANCE (%)	TC (%/K)	R <sub>T</sub> (Ω)
				2381 641 ..... <sup>(1)</sup>
				6.333
- 40	33.81	5.55	- 6.55	1116
- 35	24.50	5.02	- 6.34	808.6
- 30	17.93	4.52	- 6.15	591.7
- 25	13.25	4.03	- 5.96	437.1
- 20	9.875	3.56	- 5.78	325.9
- 15	7.425	3.10	- 5.61	245.0
- 10	5.630	2.67	- 5.45	185.8
- 5	4.304	2.24	- 5.29	142.0
0	3.315	1.84	- 5.14	109.4
5	2.573	1.44	- 4.99	84.91
10	2.011	1.07	- 4.85	66.37
15	1.583	0.70	- 4.72	52.24
20	1.254	0.34	- 4.59	41.39
25	1.0000	0.00	- 4.46	33.00
30	0.8024	.033	- 4.34	26.47
35	0.6474	0.66	- 4.23	21.37
40	0.5255	0.98	- 4.12	17.34
45	0.4288	1.28	- 4.01	14.15
50	0.3518	1.59	- 3.91	11.61
55	0.2901	1.88	- 3.81	9.572
60	0.2403	2.17	- 3.71	7.931
65	0.2001	2.45	- 3.62	6.603
70	0.1674	2.72	- 3.53	5.522
75	0.1406	2.99	- 3.44	4.639
80	0.1186	3.25	- 3.36	3.913
85	0.1004	3.51	- 3.28	3.315
90	0.08542	3.76	- 3.20	2.819
95	0.07292	4.00	- 3.13	2.406
100	0.06248	4.24	- 3.06	2.062
105	0.05372	4.47	- 2.98	1.773
110	0.04635	4.70	- 2.92	1.530
115	0.04013	4.93	- 2.85	1.324
120	0.03485	5.15	- 2.79	1.150
125	0.03037	5.36	- 2.73	1.002

**Note**

1. Replace dot in the code numbers by one of the following, depending on required R<sub>25</sub> - value:  
 4 for a tolerance of ± 2 %  
 6 for a tolerance of ± 3 %  
 3 for a tolerance of ± 5 %  
 2 for a tolerance of ± 10 %



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