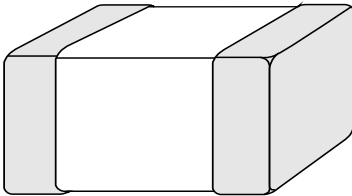


DATA SHEET



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Surface mount NTC thermistors

Preliminary specification
Supersedes data of May 17th 1999
File under BCcomponents, BC02

2001 Jan 17

Surface mount NTC thermistors

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FEATURES

- High sensitivity
- High accuracy over a wide temperature range
- Taped on reel
- Suitable for wave or reflow soldering.

APPLICATION

- Temperature compensation, sensing and protection in, for example:
 - Battery chargers
 - Consumer equipment
 - Office equipment.

DESCRIPTION

Size 0603 chip thermistors with a negative temperature coefficient and silver palladium contacts⁽¹⁾. The device has no marking.

(1) NiSn contacts available on request.

PACKAGING

Available in 8 mm punched paper tape on reel packaging of 4 000 units.

QUICK REFERENCE DATA

PARAMETER	VALUE
Resistance value at 25 °C	4.7 kΩ to 100 kΩ
Tolerance on R ₂₅ -value	±3%; ±5%; ±10%
Tolerance on B _{25/85} -value	see Table 2
Maximum dissipation at 25 °C	125 mW
Operating temperature range	–55 to +150 °C
Climatic category	40/125/56
Mass	≈0.0075 g

MECHANICAL DATA

Outline

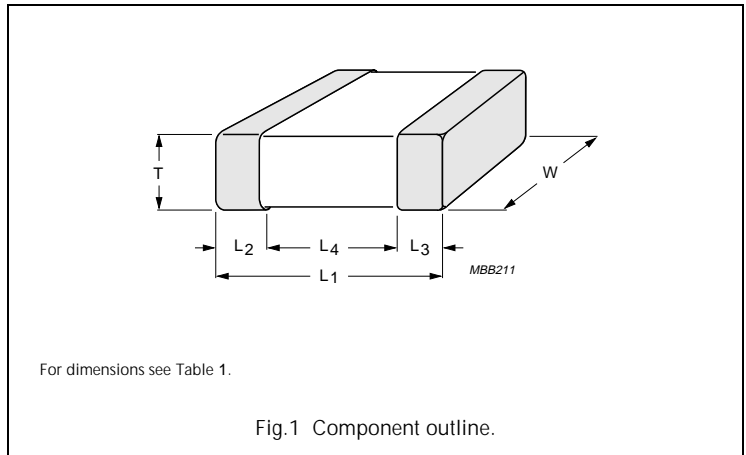


Table 1 Component dimensions; see Fig.1

L ₁ (mm)	W (mm)	T		L ₂ and L ₃ (mm)	L ₄ MIN. (mm)
		MIN. (mm)	MAX. (mm)		
1.6 ±0.1	0.8 ±0.15	0.5	1.0	0.45 ±0.2	0.2

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ELECTRICAL CHARACTERISTICS

Unless otherwise stated, measurements are in accordance with "IEC publication 60539"; see also Table 2.

PARAMETER	VALUE
Tolerance on R ₂₅	±3%; ±5%; ±10%
Tolerance on B _{25/85} -value	see Table 2
Climatic category	40/125/56
Maximum dissipation at 25 °C	125 mW
Thermal time constant τ	≈8 s
Operating temperature range	-55 to +150 °C
R/T values	see Tables 4 to 8

Table 2 R₂₅-values, B_{25/85}-values and catalogue numbers; see Tables 4 to 8

R ₂₅ (Ω)	B _{25/85} -VALUE (K)	TOLERANCE ON B _{25/85} (%)	CATALOGUE NUMBER 2322 615 2....		
			±3% TOL. ON R ₂₅	±5% TOL. ON R ₂₅	±10% TOL. ON R ₂₅
4700	3560	±3	6472	3472	2472
10000	3620	±3	6103	3103	2103
47000	3977	±3	6473	3473	2473
68000	3740	±3	6683	3683	2683
100000	3650	±3	6104	3104	2104

Table 3 Solderability and resistance to soldering heat

IEC 60068-2-20	TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
6	Tc	solderability	3 s at 215 °C; 2 s at 235 °C	ΔR/R < 5%
		resistance to soldering heat	10 s at 260 °C	ΔR/R < 5%

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Table 4 Resistance values at intermediate temperatures with R_{25} at 4700 Ω ; see also Table 2

T_{oper} (°C)	CATALOGUE NUMBER 2322 615 2.472					
	R_T/R_{25}	TC (%/K)	R_T (Ω)	3% TOL. $\Delta R/R$ (%)	5% TOL. $\Delta R/R$ (%)	10% TOL. $\Delta R/R$ (%)
-40	21.9261	-5.75	103053	9.02	16.71	22.27
-35	16.5224	-5.57	77655	8.44	15.59	21.09
-30	12.5583	-5.40	59024	7.89	14.50	19.96
-25	9.6249	-5.24	45237	7.35	13.47	18.87
-20	7.4362	-5.08	34950	6.84	12.47	17.82
-15	5.7898	-4.93	27212	6.35	11.51	16.82
-10	4.5416	-4.78	21345	5.87	10.59	15.85
-5	3.5881	-4.64	16864	5.42	9.70	14.92
0	2.8545	-4.51	13416	4.98	8.85	14.03
5	2.2860	-4.38	10744	4.55	8.02	13.17
10	1.8425	-4.25	8659.5	4.14	7.23	12.33
15	1.4941	-4.13	7022.5	3.75	6.46	11.53
20	1.2189	-4.01	5728.7	3.37	5.72	10.75
25	1.0000	-3.90	4700.0	3.00	5.00	10.00
30	0.8249	-3.80	3877.2	3.36	5.69	10.73
35	0.6841	-3.69	3215.4	3.70	6.36	11.43
40	0.57025	-3.59	2680.2	4.04	7.01	12.11
45	0.47765	-3.50	2245.0	4.36	7.64	12.77
50	0.40198	-3.40	1889.3	4.67	8.25	13.41
55	0.33984	-3.31	1597.2	4.98	8.84	14.02
60	0.28856	-3.23	1356.2	5.26	9.41	14.62
65	0.24606	-3.15	1156.5	5.56	9.97	15.21
70	0.21067	-3.07	990.1	5.83	10.51	15.77
75	0.18108	-2.99	851.06	6.10	11.03	16.32
80	0.15623	-2.91	734.29	6.37	11.54	16.86
85	0.13529	-2.84	635.86	6.62	12.04	17.37
90	0.11757	-2.77	552.56	6.87	12.52	17.88
95	0.10251	-2.71	481.81	7.11	12.99	18.37
100	0.08968	-2.64	421.50	7.34	13.45	18.85
105	0.07871	-2.58	369.91	7.57	13.89	19.31
110	0.06928	-2.52	325.64	7.79	14.32	19.77
115	0.06117	-2.46	287.51	8.01	14.74	20.21
120	0.05416	-2.41	254.57	8.22	15.15	20.64
125	0.04809	-2.35	226.03	8.43	15.55	21.06
130	0.04282	-2.30	201.23	8.63	15.94	21.46
135	0.03822	-2.25	179.62	8.82	16.32	21.86
140	0.0342	-2.20	160.73	9.02	16.70	22.25
145	0.03068	-2.15	144.17	9.20	17.06	22.63
150	0.02758	-2.10	129.63	9.38	17.41	23.00

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Table 5 Resistance values at intermediate temperatures with R_{25} at 10000 Ω ; see also Table 2

T_{oper} (°C)	CATALOGUE NUMBER 2322 615 2.103					
	R_T/R_{25}	TC (%/K)	R_T (Ω)	3% TOL. $\Delta R/R$ (%)	5% TOL. $\Delta R/R$ (%)	10% TOL. $\Delta R/R$ (%)
-40	23.0973	-5.84	230973	9.02	16.71	22.27
-35	17.3222	-5.67	173222	8.44	15.59	21.09
-30	13.1054	-5.49	131054	7.89	14.50	19.96
-25	9.99934	-5.33	99993	7.35	13.47	18.87
-20	7.69193	-5.17	76919	6.84	12.47	17.82
-15	5.96369	-5.01	59637	6.35	11.51	16.82
-10	4.6589	-4.86	46589	5.87	10.59	15.85
-5	3.66623	-4.72	36662	5.42	9.70	14.92
0	2.9054	-4.58	29054	4.98	8.85	14.03
5	2.31806	-4.45	23181	4.55	8.02	13.17
10	1.86153	-4.32	18615.3	4.14	7.23	12.33
15	1.50429	-4.20	15042.9	3.75	6.46	11.53
20	1.22295	-4.08	12229.5	3.37	5.72	10.75
25	1.00	-3.97	10000.0	3.00	5.00	10.00
30	0.82227	-3.86	8222.7	3.36	5.69	10.73
35	0.67977	-3.75	6797.7	3.70	6.36	11.43
40	0.56487	-3.65	5648.7	4.04	7.01	12.11
45	0.47174	-3.55	4717.4	4.36	7.64	12.77
50	0.39585	-3.46	3958.5	4.67	8.25	13.41
55	0.33371	-3.37	3337.1	4.98	8.84	14.02
60	0.28258	-3.28	2825.8	5.27	9.41	14.62
65	0.24031	-3.20	2403.1	5.56	9.97	15.21
70	0.20521	-3.12	2052.1	5.83	10.51	15.77
75	0.17594	-3.04	1759.37	6.10	11.03	16.32
80	0.15142	-2.96	1514.20	6.37	11.54	16.86
85	0.1308	-2.89	1308.04	6.62	12.04	17.37
90	0.1134	-2.82	1134.00	6.87	12.52	17.88
95	0.09865	-2.75	986.53	7.11	12.99	18.37
100	0.08611	-2.69	861.10	7.34	13.45	18.85
105	0.0754	-2.62	754.04	7.57	13.89	19.31
110	0.06624	-2.56	662.36	7.79	14.32	19.77
115	0.05836	-2.50	583.58	8.01	14.74	20.21
120	0.05157	-2.45	515.67	8.22	15.15	20.64
125	0.4569	-2.39	456.94	8.43	15.55	21.06
130	0.0406	-2.34	406.01	8.63	15.94	21.46
135	0.03617	-2.29	361.71	8.82	16.32	21.86
140	0.03231	-2.23	323.06	9.02	16.70	22.25
145	0.02893	-2.19	289.26	9.20	17.06	22.63
150	0.02596	-2.14	259.61	8.38	17.41	23.00

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Table 6 Resistance values at intermediate temperatures with R_{25} at 47000 Ω ; see also Table 2

T_{oper} (°C)	CATALOGUE NUMBER 2322 615 2.473					
	R_T/R_{25}	TC (%/K)	R_T (Ω)	3% TOL. $\Delta R/R$ (%)	5% TOL. $\Delta R/R$ (%)	10% TOL. $\Delta R/R$ (%)
-40	33.21001	-6.62	1560870	9.02	16.71	22.27
-35	23.99043	-6.39	1127550	8.44	15.59	21.09
-30	17.52031	-6.18	823454	7.89	14.50	19.96
-25	12.92895	-5.98	607660	7.35	13.47	18.87
-20	9.63600	-5.78	452892	6.84	12.47	17.82
-15	7.25018	-5.60	340758	6.35	11.51	16.82
-10	5.50470	-5.42	258721	5.87	10.59	15.85
-5	4.21578	-5.25	198142	5.42	9.70	14.92
0	3.25548	-5.09	153008	4.98	8.85	14.03
5	2.53391	-4.93	119094	4.55	8.02	13.17
10	1.98726	-4.79	93401	4.14	7.23	12.33
15	1.56988	-4.64	73784	3.75	6.46	11.53
20	1.24880	-4.51	58694	3.37	5.72	10.75
25	1.00000	-4.38	47000	3.00	5.00	10.00
30	0.80592	-4.25	37878	3.36	5.69	10.73
35	0.65349	-4.13	30714	3.70	6.36	11.43
40	0.53300	-4.02	25051	4.04	7.01	12.11
45	0.43718	-3.91	20547	4.36	7.64	12.77
50	0.36053	-3.80	16945	4.67	8.25	13.41
55	0.29887	-3.70	14047	4.98	8.84	14.02
60	0.24900	-3.60	11703	5.27	9.41	14.62
65	0.20845	-3.51	9797.0	5.56	9.97	15.21
70	0.17531	-3.42	8239.5	5.83	10.51	15.77
75	0.14809	-3.33	6960.4	6.10	11.03	16.32
80	0.12564	-3.26	5905.1	6.37	11.54	16.86
85	0.10703	-3.17	5030.6	6.62	12.04	17.37
90	0.09154	-3.09	4203.6	6.87	12.52	17.88
95	0.09865	-3.01	3694.1	7.11	12.99	18.37
100	0.08611	-2.94	3183.4	7.34	13.45	18.85
105	0.0754	-2.87	2753.1	7.57	13.89	19.31
110	0.06624	-2.80	2389.1	7.79	14.32	19.77
115	0.05836	-2.74	2080.2	8.01	14.74	20.21
120	0.05157	-2.67	1817.0	8.22	15.15	20.64
125	0.4569	-2.61	1592.1	8.43	15.55	21.06
130	0.0406	-2.55	1399.2	8.63	15.94	21.46
135	0.03617	-2.50	1233.2	8.82	16.32	21.86
140	0.03231	-2.44	1090.0	9.02	16.70	22.25
145	0.02893	-2.39	966.0	9.20	17.06	22.63
150	0.02596	-2.34	858.4	8.38	17.41	23.00

Surface mount NTC thermistors

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Table 7 Resistance values at intermediate temperatures with R_{25} at 68000 Ω ; see also Table 2

T_{oper} (°C)	CATALOGUE NUMBER 2322 615 2.683					
	R_T/R_{25}	TC (%/K)	R_T (Ω)	3% TOL. $\Delta R/R$ (%)	5% TOL. $\Delta R/R$ (%)	10% TOL. $\Delta R/R$ (%)
-40	25.783	-6.07	1753245	9.02	16.71	22.27
-35	19.1253	-5.88	1300524	8.44	15.59	21.09
-30	14.32	-5.70	973760	7.89	14.50	19.96
-25	10.8187	-5.52	735675	7.35	13.47	18.87
-20	8.24438	-5.35	560618	6.84	12.47	17.82
-15	6.33489	-5.19	430772	6.35	11.51	16.82
-10	4.90655	-5.03	333646	5.87	10.59	15.85
-5	3.82943	-4.88	260401	5.42	9.70	14.92
0	3.01078	-4.74	204733	4.98	8.85	14.03
5	2.3839	-4.60	162105	4.55	8.02	13.17
10	1.90036	-4.47	129225	4.14	7.23	12.33
15	1.52479	-4.34	103686	3.75	6.46	11.53
20	1.23112	-4.22	83716	3.37	5.72	10.75
25	1.00	-4.10	68000	3.00	5.00	10.00
30	0.81697	-3.99	55554.1	3.36	5.69	10.73
35	0.67116	-3.88	45639.0	3.70	6.36	11.43
40	0.55433	-3.77	37694.3	4.04	7.01	12.11
45	0.46019	-3.67	31293.0	4.36	7.64	12.77
50	0.38393	-3.58	26107.6	4.67	8.25	13.41
55	0.32184	-3.48	21885.4	4.98	8.84	14.02
60	0.27103	-3.39	18430.3	5.27	9.41	14.62
65	0.22926	-3.30	15589.4	5.56	9.97	15.21
70	0.19475	-3.22	13242.7	5.83	10.51	15.77
75	0.16611	-3.14	11295.4	6.10	11.03	16.32
80	0.14225	-3.06	9672.7	6.37	11.54	16.86
85	0.12228	-2.99	8314.8	6.62	12.04	17.37
90	0.1055	-2.92	7173.9	6.87	12.52	17.88
95	0.09135	-2.85	6211.6	7.11	12.99	18.37
100	0.07936	-2.78	5396.8	7.34	13.45	18.85
105	0.06918	-2.71	4704.5	7.57	13.89	19.31
110	0.0605	-2.65	4114.1	7.79	14.32	19.77
115	0.05307	-2.59	3609.0	8.01	14.74	20.21
120	0.0467	-2.53	3175.4	8.22	15.15	20.64
125	0.04121	-2.47	2802.0	8.43	15.55	21.06
130	0.03646	-2.42	2479.4	8.63	15.94	21.46
135	0.03235	-2.37	2199.9	8.82	16.32	21.86
140	0.02878	-2.31	1957.0	9.02	16.70	22.25
145	0.02567	-2.26	1745.4	9.20	17.06	22.63
150	0.02295	-2.22	1560.5	9.38	17.41	23.00

Surface mount NTC thermistors

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Table 8 Resistance values at intermediate temperatures with R_{25} at 100000 Ω ; see also Table 2

T_{oper} (°C)	CATALOGUE NUMBER 2322 615 2.104					
	R_T/R_{25}	TC (%/K)	R_T (Ω)	3% TOL. $\Delta R/R$ (%)	5% TOL. $\Delta R/R$ (%)	10% TOL. $\Delta R/R$ (%)
-40	23.8997	-5.92	2389969	9.02	16.71	22.27
-35	17.8586	-5.74	1785861	8.44	15.59	21.09
-30	13.465	-5.56	1346502	7.89	14.50	19.96
-25	10.2407	-5.39	1024071	7.35	13.47	18.87
-20	7.85378	-5.23	785378	6.84	12.47	17.82
-15	6.07181	-5.07	607181	6.35	11.51	16.82
-10	4.73061	-4.92	473061	5.87	10.59	15.85
-5	3.7132	-4.77	371320	5.42	9.70	14.92
0	2.93554	-4.63	293554	4.98	8.85	14.03
5	2.33677	-4.50	233677	4.55	8.02	13.17
10	1.87249	-4.37	187249	4.14	7.23	12.33
15	1.51004	-4.24	151004	3.75	6.46	11.53
20	1.22522	-4.12	122522	3.37	5.72	10.75
25	1.00	-4.01	100000	3.00	5.00	10.00
30	0.82081	-3.89	82081.4	3.36	5.69	10.73
35	0.67742	-3.79	67741.7	3.70	6.36	11.43
40	0.56201	-3.68	56201.1	4.04	7.01	12.11
45	0.46863	-3.59	46862.6	4.36	7.64	12.77
50	0.39266	-3.49	39266.1	4.67	8.25	13.41
55	0.33055	-3.40	33055.3	4.98	8.84	14.02
60	0.27953	-3.31	27952.7	5.27	9.41	14.62
65	0.23741	-3.22	23740.6	5.56	9.97	15.21
70	0.20248	-3.14	20247.7	5.83	10.51	15.77
75	0.17339	-3.06	17338.6	6.10	11.03	16.32
80	0.14905	-2.99	14905.4	6.37	11.54	16.86
85	0.12862	-2.91	12861.8	6.62	12.04	17.37
90	0.11139	-2.84	11138.6	6.87	12.52	17.88
95	0.0968	-2.77	9680.1	7.11	12.99	18.37
100	0.08441	-2.71	8441.1	7.34	13.45	18.85
105	0.07385	-2.64	7384.6	7.57	13.89	19.31
110	0.06481	-2.58	6480.8	7.79	14.32	19.77
115	0.05705	-2.52	5704.9	8.01	14.74	20.21
120	0.05037	-2.46	5036.7	8.22	15.15	20.64
125	0.04459	-2.41	4459.4	8.43	15.55	21.06
130	0.03959	-2.35	3959.2	8.63	15.94	21.46
135	0.03524	-2.30	3524.4	8.82	16.32	21.86
140	0.03146	-2.25	3145.5	9.02	16.70	22.25
145	0.02814	-2.20	2814.4	9.20	17.06	22.63
150	0.02524	-2.15	2524.2	9.38	17.41	23.00