



## **NTC thermistors for temperature measurement**

SMD NTC thermistors  
with nickel barrier termination,  
case size 0402

**Series/Type:**      **B572\*\*V**  
**Date:**              March 2006

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**SMD**
**Applications**

- Temperature measurement and compensation in
  - mobile phone applications (e.g. battery pack, TCXO, LCD)
  - data systems
  - automotive electronics

**Features**

- Multilayer SMD NTC with inner electrodes
- Excellent long-term ageing stability in high-temperature and high-humidity environment
- Superior resistance stability during soldering (change <1%)

**Options**

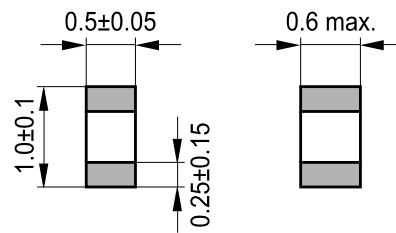
Alternative resistance ratings, resistance tolerance and B value tolerances available on request

**Delivery mode**

Cardboard tape, 180-mm reel

**General technical data**

Climatic category	(IEC 60068-1)		55/125/56	
Max. power	(at 25 °C, on PCB)	$P_{25}^{1)}$	150	mW
Resistance tolerance		$\Delta R_R/R_R$	±5	%
Rated temperature		$T_R$	25	°C
Dissipation factor	(on PCB)	$\delta_{th}^{1)}$	approx. 2.5	mW/K
Thermal cooling time constant	(on PCB)	$\tau_c^{1)}$	approx. 3	s
Heat capacity		$C_{th}^{1)}$	approx. 7.5	mJ/K

**Dimensional drawing**


■ Termination TNT0395-Q-E

Dimensions in mm

Approx. weight 4.5 mg

1) Depends on mounting situation


**Electrical specification and ordering codes**

R <sub>25</sub> Ω	No. of R/T characteristic	B <sub>25/50</sub> K	B <sub>25/85</sub> K	B <sub>25/100</sub> K	Ordering code
470	8501	3500	3540	3550 ±3%	B57211V2471J060
3.3 k	8502	3940	3980	4000 ±3%	B57221V2332J060
4.7 k	8501	3500	3540	3550 ±3%	B57211V2472J060
4.7 k	8502	3940	3980	4000 ±3%	B57221V2472J060
10 k	8502	3940	3980	4000 ±3%	B57221V2103J060
22 k	8506	4473	4548	4575 ±3%	B57261V2223J060
33 k	8506	4473	4548	4575 ±3%	B57261V2333J060
47 k	8502	3940	3980	4000 ±3%	B57221V2473J060

**Reliability data**

SMD NTC thermistors are tested in accordance with IEC 60068. The parts are mounted on a standardized PCB in accordance with IEC 60539-1.

Test	Standard	Test conditions	ΔR <sub>25</sub> /R <sub>25</sub> (typical)	Remarks
Storage in dry heat	IEC 60068-2-2 JIS C 0021	Storage at upper category temperature T: (125 ±2) °C t: 1000 h	< 2%	
Storage in damp heat, steady state	IEC 60068-2-78 JIS C 0022	Temperature of air: (40 ±2) °C Relative humidity of air: (93 +2/-3)% Duration: 56 days	< 2%	
Rapid temperature cycling	IEC 60068-2-14 JIS C 0025	Lower test temperature: -55 °C Upper test temperature: 125 °C Number of cycles: 100	< 2%	
Endurance		P <sub>max</sub> : 150 mW T: (65 ±2) °C t: 1000 h	< 2%	
Solderability	IEC 60068-2-58 JIS C 0054	Solderability: (215 ±3) °C, (3 ±0.3) s (235 ±5) °C, (2 ±0.2) s  Resistance to soldering heat: (260 ±5) °C, (10 ±1) s		95% of terminations wetted
Resistance drift after soldering		Reflow soldering profile	< 1%	


**R/T characteristics**

<b>B57211V2471J060</b>						
R/T No.	8501					
T (°C)	B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 470 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	26618	21787	31449	18.1	2.8	6.5
-50.0	19333	16035	22630	17.1	2.7	6.3
-45.0	14198	11925	16471	16.0	2.6	6.1
-40.0	10537	8956	12119	15.0	2.6	5.9
-35.0	7899	6790	9009	14.0	2.5	5.7
-30.0	5979	5194	6764	13.1	2.4	5.5
-25.0	4566	4007	5126	12.2	2.3	5.3
-20.0	3518	3117	3919	11.4	2.2	5.1
-15.0	2733	2444	3022	10.6	2.1	5.0
-10.0	2140	1930	2350	9.8	2.0	4.8
-5.0	1689	1536	1842	9.0	1.9	4.7
0.0	1342	1231	1454	8.3	1.8	4.5
5.0	1074	992.4	1156	7.6	1.7	4.4
10.0	865.6	805.5	925.7	6.9	1.6	4.3
15.0	701.9	657.7	746.0	6.3	1.5	4.1
20.0	572.7	540.3	605.1	5.7	1.4	4.0
<b>25.0</b>	<b>470.0</b>	<b>446.5</b>	<b>493.5</b>	<b>5.0</b>	<b>1.3</b>	<b>3.9</b>
30.0	387.9	366.0	409.8	5.6	1.5	3.8
35.0	321.9	301.9	341.9	6.2	1.7	3.7
40.0	268.6	250.4	286.7	6.8	1.9	3.6
45.0	225.2	208.7	241.6	7.3	2.1	3.5
50.0	189.7	174.9	204.5	7.8	2.3	3.4
55.0	160.5	147.2	173.9	8.3	2.5	3.3
60.0	136.5	124.5	148.5	8.8	2.7	3.2
65.0	116.5	105.7	127.3	9.3	3.0	3.1
70.0	99.92	90.19	109.6	9.7	3.2	3.0
75.0	86.01	77.25	94.76	10.2	3.4	3.0
80.0	74.32	66.43	82.21	10.6	3.7	2.9
85.0	64.46	57.35	71.57	11.0	3.9	2.8
90.0	56.11	49.69	62.53	11.4	4.2	2.7
95.0	49.01	43.20	54.81	11.8	4.4	2.7
100.0	42.95	37.69	48.20	12.2	4.7	2.6
105.0	37.76	33.00	42.52	12.6	5.0	2.5
110.0	33.30	28.98	37.62	13.0	5.2	2.5
115.0	29.45	25.53	33.38	13.3	5.5	2.4
120.0	26.13	22.55	29.70	13.7	5.8	2.4
125.0	23.24	19.98	26.50	14.0	6.1	2.3



<b>B57221V2332J060</b>						
R/T No.	8502					
T (°C)	B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 3300 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	317320	254460	380180	19.8	2.7	7.4
-50.0	220740	179730	261750	18.6	2.6	7.1
-45.0	155520	128460	182580	17.4	2.5	6.9
-40.0	110900	92856	128950	16.3	2.4	6.6
-35.0	80000	67848	92153	15.2	2.4	6.4
-30.0	58349	50090	66607	14.2	2.3	6.2
-25.0	43006	37346	48665	13.2	2.2	6.0
-20.0	32017	28109	35924	12.2	2.1	5.8
-15.0	24065	21349	26781	11.3	2.0	5.6
-10.0	18254	16355	20153	10.4	1.9	5.4
-5.0	13967	12633	15302	9.6	1.8	5.3
0.0	10777	9836	11718	8.7	1.7	5.1
5.0	8382	7716	9048	7.9	1.6	4.9
10.0	6569	6097	7041	7.2	1.5	4.8
15.0	5186	4852	5521	6.4	1.4	4.7
20.0	4123	3887	4360	5.7	1.3	4.5
<b>25.0</b>	<b>3300</b>	<b>3135</b>	<b>3465</b>	<b>5.0</b>	<b>1.1</b>	<b>4.4</b>
30.0	2658	2506	2810	5.7	1.3	4.3
35.0	2154	2018	2291	6.4	1.5	4.1
40.0	1757	1634	1879	7.0	1.7	4.0
45.0	1440	1331	1549	7.6	1.9	3.9
50.0	1187	1090	1284	8.2	2.1	3.8
55.0	984.0	898.1	1070	8.7	2.4	3.7
60.0	819.6	743.6	895.7	9.3	2.6	3.6
65.0	686.0	618.7	753.3	9.8	2.8	3.5
70.0	576.8	517.2	636.4	10.3	3.0	3.4
75.0	487.2	434.4	540.0	10.8	3.2	3.3
80.0	413.3	366.5	460.0	11.3	3.5	3.2
85.0	352.0	310.5	393.5	11.8	3.7	3.2
90.0	301.1	264.2	337.9	12.3	4.0	3.1
95.0	258.5	225.6	291.3	12.7	4.2	3.0
100.0	222.7	193.4	252.0	13.1	4.5	2.9
105.0	192.6	166.5	218.7	13.6	4.7	2.9
110.0	167.1	143.8	190.5	14.0	5.0	2.8
115.0	145.5	124.6	166.5	14.4	5.3	2.7
120.0	127.1	108.3	145.9	14.8	5.5	2.7
125.0	111.4	94.50	128.3	15.2	5.8	2.6



<b>B57211V2472J060</b>						
R/T No.	8501					
T (°C)	B <sub>25/100</sub> = 3550 K, R <sub>25</sub> = 4700 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	266180	217870	314490	18.1	2.8	6.5
-50.0	193330	160360	226300	17.1	2.7	6.3
-45.0	141980	119250	164710	16.0	2.6	6.1
-40.0	105380	89559	121190	15.0	2.6	5.9
-35.0	78994	67896	90092	14.0	2.5	5.7
-30.0	59786	51937	67636	13.1	2.4	5.5
-25.0	45663	40071	51256	12.2	2.3	5.3
-20.0	35181	31171	39192	11.4	2.2	5.1
-15.0	27331	24438	30224	10.6	2.1	5.0
-10.0	21402	19305	23500	9.8	2.0	4.8
-5.0	16888	15360	18415	9.0	1.9	4.7
0.0	13422	12306	14539	8.3	1.8	4.5
5.0	10743	9924	11561	7.6	1.7	4.4
10.0	8656	8055	9257	6.9	1.6	4.3
15.0	7019	6577	7460	6.3	1.5	4.1
20.0	5727	5403	6051	5.7	1.4	4.0
<b>25.0</b>	<b>4700</b>	<b>4465</b>	<b>4935</b>	<b>5.0</b>	<b>1.3</b>	<b>3.9</b>
30.0	3879	3660	4098	5.6	1.5	3.8
35.0	3219	3019	3419	6.2	1.7	3.7
40.0	2686	2504	2867	6.8	1.9	3.6
45.0	2252	2087	2416	7.3	2.1	3.5
50.0	1897	1749	2045	7.8	2.3	3.4
55.0	1605	1472	1739	8.3	2.5	3.3
60.0	1365	1245	1485	8.8	2.7	3.2
65.0	1165	1057	1273	9.3	3.0	3.1
70.0	999.2	901.9	1096	9.7	3.2	3.0
75.0	860.1	772.5	947.6	10.2	3.4	3.0
80.0	743.2	664.3	822.1	10.6	3.7	2.9
85.0	644.6	573.5	715.7	11.0	3.9	2.8
90.0	561.1	496.9	625.3	11.4	4.2	2.7
95.0	490.1	432.0	548.1	11.8	4.4	2.7
100.0	429.5	376.9	482.0	12.2	4.7	2.6
105.0	377.6	330.0	425.2	12.6	5.0	2.5
110.0	333.0	289.8	376.2	13.0	5.2	2.5
115.0	294.5	255.3	333.8	13.3	5.5	2.4
120.0	261.3	225.5	297.0	13.7	5.8	2.4
125.0	232.4	199.8	265.0	14.0	6.1	2.3



<b>B57221V2472J060</b>						
R/T No.	8502					
T (°C)	B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 4700 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	451940	362410	541470	19.8	2.7	7.4
-50.0	314390	255990	372800	18.6	2.6	7.1
-45.0	221500	182960	260030	17.4	2.5	6.9
-40.0	157950	132250	183650	16.3	2.4	6.6
-35.0	113940	96632	131250	15.2	2.4	6.4
-30.0	83102	71340	94865	14.2	2.3	6.2
-25.0	61251	53190	69311	13.2	2.2	6.0
-20.0	45599	40034	51165	12.2	2.1	5.8
-15.0	34274	30406	38142	11.3	2.0	5.6
-10.0	25998	23293	28702	10.4	1.9	5.4
-5.0	19893	17992	21793	9.6	1.8	5.3
0.0	15349	14008	16690	8.7	1.7	5.1
5.0	11938	10990	12886	7.9	1.6	4.9
10.0	9356	8684	10028	7.2	1.5	4.8
15.0	7386	6910	7863	6.4	1.4	4.7
20.0	5872	5535	6209	5.7	1.3	4.5
<b>25.0</b>	<b>4700</b>	<b>4465</b>	<b>4935</b>	<b>5.0</b>	<b>1.1</b>	<b>4.4</b>
30.0	3786	3570	4002	5.7	1.3	4.3
35.0	3069	2873	3264	6.4	1.5	4.1
40.0	2502	2327	2676	7.0	1.7	4.0
45.0	2051	1896	2207	7.6	1.9	3.9
50.0	1691	1553	1829	8.2	2.1	3.8
55.0	1402	1279	1524	8.7	2.4	3.7
60.0	1167	1059	1276	9.3	2.6	3.6
65.0	977.0	881.2	1073	9.8	2.8	3.5
70.0	821.5	736.7	906.4	10.3	3.0	3.4
75.0	693.9	618.7	769.0	10.8	3.2	3.3
80.0	588.6	522.0	655.2	11.3	3.5	3.2
85.0	501.4	442.2	560.5	11.8	3.7	3.2
90.0	428.8	376.2	481.3	12.3	4.0	3.1
95.0	368.1	321.3	414.9	12.7	4.2	3.0
100.0	317.2	275.5	358.9	13.1	4.5	2.9
105.0	274.3	237.1	311.5	13.6	4.7	2.9
110.0	238.0	204.8	271.3	14.0	5.0	2.8
115.0	207.3	177.5	237.1	14.4	5.3	2.7
120.0	181.0	154.3	207.8	14.8	5.5	2.7
125.0	158.6	134.6	182.7	15.2	5.8	2.6



<b>B57221V2103J060</b>						
R/T No.	8502					
T (°C)	B <sub>25/100</sub> = 4000 K, R <sub>25</sub> = 10000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	961580	771090	1152100	19.8	2.7	7.4
-50.0	668920	544650	793180	18.6	2.6	7.1
-45.0	471270	389270	553260	17.4	2.5	6.9
-40.0	336060	281380	390740	16.3	2.4	6.6
-35.0	242430	205600	279250	15.2	2.4	6.4
-30.0	176810	151790	201840	14.2	2.3	6.2
-25.0	130320	113170	147470	13.2	2.2	6.0
-20.0	97020	85179	108860	12.2	2.1	5.8
-15.0	72923	64693	81153	11.3	2.0	5.6
-10.0	55314	49560	61068	10.4	1.9	5.4
-5.0	42325	38282	46368	9.6	1.8	5.3
0.0	32657	29805	35510	8.7	1.7	5.1
5.0	25400	23382	27418	7.9	1.6	4.9
10.0	19907	18477	21336	7.2	1.5	4.8
15.0	15716	14703	16729	6.4	1.4	4.7
20.0	12494	11778	13211	5.7	1.3	4.5
<b>25.0</b>	<b>10000</b>	<b>9500</b>	<b>10500</b>	<b>5.0</b>	<b>1.1</b>	<b>4.4</b>
30.0	8055	7595	8515	5.7	1.3	4.3
35.0	6529	6114	6944	6.4	1.5	4.1
40.0	5323	4951	5694	7.0	1.7	4.0
45.0	4364	4034	4695	7.6	1.9	3.9
50.0	3598	3304	3892	8.2	2.1	3.8
55.0	2982	2722	3242	8.7	2.4	3.7
60.0	2484	2253	2714	9.3	2.6	3.6
65.0	2079	1875	2283	9.8	2.8	3.5
70.0	1748	1567	1928	10.3	3.0	3.4
75.0	1476	1316	1636	10.8	3.2	3.3
80.0	1252	1111	1394	11.3	3.5	3.2
85.0	1067	940.9	1193	11.8	3.7	3.2
90.0	912.3	800.5	1024	12.3	4.0	3.1
95.0	783.2	683.7	882.7	12.7	4.2	3.0
100.0	674.9	586.2	763.6	13.1	4.5	2.9
105.0	583.6	504.5	662.8	13.6	4.7	2.9
110.0	506.5	435.7	577.3	14.0	5.0	2.8
115.0	441.0	377.6	504.4	14.4	5.3	2.7
120.0	385.2	328.3	442.1	14.8	5.5	2.7
125.0	337.5	286.4	388.7	15.2	5.8	2.6





<b>B57261V2223J060</b>						
R/T No.	8506					
T (°C)	B <sub>25/100</sub> = 4575 K, R <sub>25</sub> = 22000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	3401300	2655300	4147300	21.9	2.7	8.0
-50.0	2296100	1824900	2767300	20.5	2.7	7.7
-45.0	1569900	1268900	1871000	19.2	2.6	7.5
-40.0	1086500	892190	1280800	17.9	2.5	7.2
-35.0	760630	634000	887260	16.6	2.4	7.0
-30.0	538370	455130	621620	15.5	2.3	6.8
-25.0	385080	329910	440240	14.3	2.2	6.6
-20.0	278200	241390	315020	13.2	2.1	6.4
-15.0	202930	178210	227650	12.2	2.0	6.2
-10.0	149390	132700	166080	11.2	1.9	6.0
-5.0	110950	99635	122270	10.2	1.7	5.9
0.0	83105	75406	90803	9.3	1.6	5.7
5.0	62755	57508	68001	8.4	1.5	5.5
10.0	47760	44183	51336	7.5	1.4	5.4
15.0	36622	34188	39057	6.6	1.3	5.2
20.0	28286	26635	29937	5.8	1.1	5.1
<b>25.0</b>	<b>22000</b>	<b>20900</b>	<b>23100</b>	<b>5.0</b>	<b>1.0</b>	<b>5.0</b>
30.0	17226	16225	18227	5.8	1.2	4.8
35.0	13576	12687	14464	6.5	1.4	4.7
40.0	10766	9984	11547	7.3	1.6	4.6
45.0	8589	7906	9271	7.9	1.8	4.5
50.0	6892	6298	7485	8.6	2.0	4.3
55.0	5561	5046	6076	9.3	2.2	4.2
60.0	4512	4065	4958	9.9	2.4	4.1
65.0	3679	3293	4065	10.5	2.6	4.0
70.0	3016	2681	3350	11.1	2.8	3.9
75.0	2484	2194	2773	11.7	3.0	3.8
80.0	2055	1804	2306	12.2	3.3	3.7
85.0	1708	1490	1926	12.8	3.5	3.7
90.0	1426	1237	1616	13.3	3.7	3.6
95.0	1196	1031	1361	13.8	4.0	3.5
100.0	1007	862.9	1151	14.3	4.2	3.4
105.0	851.1	725.2	977.0	14.8	4.5	3.3
110.0	722.2	612.0	832.4	15.3	4.7	3.2
115.0	615.1	518.4	711.8	15.7	5.0	3.2
120.0	525.7	440.7	610.8	16.2	5.2	3.1
125.0	451.0	376.0	525.9	16.6	5.5	3.0



<b>B57261V2333J060</b>						
R/T No.	8506					
T (°C)	B <sub>25/100</sub> = 4575 K, R <sub>25</sub> = 33000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	5102000	3983000	6220900	21.9	2.7	8.0
-50.0	3444200	2737400	4151000	20.5	2.7	7.7
-45.0	2354900	1903400	2806500	19.2	2.6	7.5
-40.0	1629700	1338300	1921200	17.9	2.5	7.2
-35.0	1140900	951000	1330900	16.6	2.4	7.0
-30.0	807560	682690	932430	15.5	2.3	6.8
-25.0	577610	494870	660360	14.3	2.2	6.6
-20.0	417310	362080	472530	13.2	2.1	6.4
-15.0	304400	267310	341480	12.2	2.0	6.2
-10.0	224090	199050	249130	11.2	1.9	6.0
-5.0	166430	149450	183410	10.2	1.7	5.9
0.0	124660	113110	136200	9.3	1.6	5.7
5.0	94132	86263	102000	8.4	1.5	5.5
10.0	71640	66275	77005	7.5	1.4	5.4
15.0	54934	51282	58585	6.6	1.3	5.2
20.0	42429	39953	44905	5.8	1.1	5.1
<b>25.0</b>	<b>33000</b>	<b>31350</b>	<b>34650</b>	<b>5.0</b>	<b>1.0</b>	<b>5.0</b>
30.0	25839	24338	27340	5.8	1.2	4.8
35.0	20363	19031	21696	6.5	1.4	4.7
40.0	16148	14977	17320	7.3	1.6	4.6
45.0	12883	11859	13906	7.9	1.8	4.5
50.0	10337	9447	11228	8.6	2.0	4.3
55.0	8341	7569	9114	9.3	2.2	4.2
60.0	6767	6098	7436	9.9	2.4	4.1
65.0	5519	4940	6098	10.5	2.6	4.0
70.0	4523	4022	5025	11.1	2.8	3.9
75.0	3726	3291	4160	11.7	3.0	3.8
80.0	3083	2706	3460	12.2	3.3	3.7
85.0	2563	2236	2890	12.8	3.5	3.7
90.0	2140	1855	2424	13.3	3.7	3.6
95.0	1794	1546	2042	13.8	4.0	3.5
100.0	1510	1294	1726	14.3	4.2	3.4
105.0	1277	1088	1465	14.8	4.5	3.3
110.0	1083	917.9	1249	15.3	4.7	3.2
115.0	922.6	777.5	1068	15.7	5.0	3.2
120.0	788.6	661.1	916.2	16.2	5.2	3.1
125.0	676.4	564.1	788.8	16.6	5.5	3.0



<b>B57221V2473J060</b>						
R/T No.	8503					
T (°C)	B <sub>25/100</sub> = 4500 K, R <sub>25</sub> = 47000 Ω, T <sub>R</sub> = 25 °C, ΔR <sub>R</sub> /R <sub>R</sub> = ± 5%					
	R <sub>nom</sub> [Ω]	R <sub>min</sub> [Ω]	R <sub>max</sub> [Ω]	ΔR <sub>R</sub> /R <sub>R</sub> [±%]	ΔT[±°C]	α (%/K)
-55.0	6228300	4879600	7577000	21.7	2.8	7.8
-50.0	4254600	3392300	5116900	20.3	2.7	7.5
-45.0	2943900	2386300	3501600	18.9	2.6	7.2
-40.0	2061700	1697400	2426100	17.7	2.5	7.0
-35.0	1460300	1220000	1700700	16.5	2.4	6.8
-30.0	1045500	885590	1205300	15.3	2.3	6.6
-25.0	756070	648910	863230	14.2	2.2	6.4
-20.0	552060	479750	624370	13.1	2.1	6.2
-15.0	406800	357710	455880	12.1	2.0	6.0
-10.0	302380	268900	335870	11.1	1.9	5.8
-5.0	226650	203720	249580	10.1	1.8	5.7
0.0	171240	155500	186990	9.2	1.7	5.5
5.0	130370	119550	141200	8.3	1.5	5.4
10.0	99988	92540	107440	7.4	1.4	5.2
15.0	77226	72113	82339	6.6	1.3	5.1
20.0	60051	56554	63547	5.8	1.2	5.0
<b>25.0</b>	<b>47000</b>	<b>44650</b>	<b>49350</b>	<b>5.0</b>	<b>1.0</b>	<b>4.8</b>
30.0	37017	34871	39163	5.8	1.2	4.7
35.0	29331	27419	31243	6.5	1.4	4.6
40.0	23376	21689	25064	7.2	1.6	4.5
45.0	18736	17256	20215	7.9	1.8	4.4
50.0	15098	13807	16389	8.6	2.0	4.3
55.0	12230	11106	13354	9.2	2.2	4.2
60.0	9958	8981	10934	9.8	2.4	4.1
65.0	8147	7299	8995	10.4	2.6	4.0
70.0	6697	5961	7433	11.0	2.8	3.9
75.0	5530	4891	6169	11.6	3.1	3.8
80.0	4587	4032	5142	12.1	3.3	3.7
85.0	3821	3338	4304	12.6	3.5	3.6
90.0	3196	2776	3617	13.2	3.7	3.5
95.0	2684	2318	3051	13.7	4.0	3.5
100.0	2263	1943	2583	14.2	4.2	3.4
105.0	1915	1635	2195	14.6	4.4	3.3
110.0	1627	1381	1872	15.1	4.7	3.2
115.0	1386	1171	1602	15.5	4.9	3.2
120.0	1186	996.2	1375	16.0	5.2	3.1
125.0	1018	850.5	1185	16.4	5.4	3.0



## Cautions and warnings

### General

See "Important notes" at the end of this document.

### Storage

- Store thermistors only in original packaging. Do not open the package before storage.
- Storage conditions in original packaging: storage temperature  $-25\text{ °C} \dots +45\text{ °C}$ , relative humidity  $\leq 75\%$  annual mean, maximum 95%, dew precipitation is inadmissible.
- Do not store SMDs where they are exposed to heat or direct sunlight. Otherwise, the packing material may be deformed or SMDs may stick together, causing problems during mounting.
- Avoid contamination of thermistors surface during storage, handling and processing.
- Avoid storage of thermistor in harmful environments like corrosive gases (SO<sub>x</sub>, Cl etc).
- After opening the factory seals, such as polyvinyl-sealed packages, use the SMDs as soon as possible.
- Solder thermistors after shipment from EPCOS within the time specified:  
SMDs: 12 months  
Leaded components: 24 months

### Handling

- NTC thermistors must not be dropped. Chip-offs must not be caused during handling of NTCs.
- Components must not be touched with bare hands. Gloves are recommended.
- Avoid contamination of thermistor surface during handling.

### Soldering

- Use resin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.

### Mounting

- When NTC thermistors are encapsulated with sealing material or overmolded with plastic material, the precautions given in chapter "Mounting instructions", "Sealing, potting and overmolding" must be observed.
- Electrode must not be scratched before/during/after the mounting process.
- Contacts and housings used for assembly with thermistor have to be clean before mounting.
- During operation, the thermistor's surface temperature can be very high (ICL). Ensure that adjacent components are placed at a sufficient distance from the thermistor to allow for proper cooling of the thermistors.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of the thermistor. Be sure that surrounding parts and materials can withstand this temperature.
- Make sure that thermistors (ICLs) are adequately ventilated to avoid overheating.
- Avoid contamination of thermistor surface during processing.

**SMD**

**Operation**

- Use thermistors only within the specified operating temperature range.
- Use thermistors only within the specified voltage and current ranges (ICLs).
- Environmental conditions must not harm the thermistors. Use thermistors only in normal atmospheric conditions.
- Contact of NTC thermistors with any liquids and solvents should be prevented. It must be ensured that no water enters the NTC thermistor (e.g. through plug terminals). For measurement purposes (checking the specified resistance vs. temperature), the component must not be immersed in water but in suitable liquids (e.g. Galden).
- Avoid dewing and condensation.
- Be sure to provide an appropriate fail-safe function to prevent secondary product damage caused by malfunction (e.g. use VDR for limitation of overvoltage condition).

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of passive electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of a passive electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of a passive electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as “hazardous”)**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.epcos.com/material](http://www.epcos.com/material)). Should you have any more detailed questions, please contact our sales offices.
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