



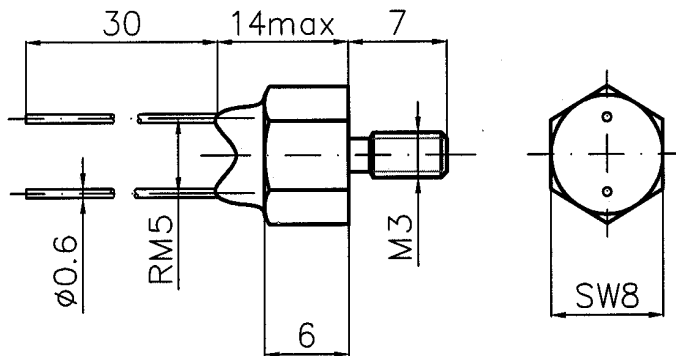
## **NTC thermistors for temperature measurement**

### NTC Probes

**Series/Type:** K45/10k/J  
**Ordering code:** B57045K0103J000  
Date: 2008-11-24  
Version: 1

**Application**

Temperature measurement  
(chassis mounting)



Dimensions in mm

**Version**

NTC disc potted into aluminium case  
Wire: Copper, tinned, Ø 0.6 mm  
Lead spacing: 5 ± 1 mm

**Ratings and characteristics**

Climatic category (IEC 60068-1)		: 55/125/56
Lower category temperature		[°C]: -55
Upper category temperature		[°C]: 125
Rated resistance $R_N$ // Tolerance	$R_N$	[Ω // %]: 10.000 // ± 5
Rated temperature	$T_N$	[°C]: 25
B-value : $B_{(25/100)}$ // Tolerance	$B_N$	[K//%]: 4300 // ± 5
R/T-Curve no. // $R_{25}$		[n//Ω]: 2904 // 10.000
Max power rating at 25°C	$P_{25}$	[mW]: 450
Dissipation factor (in air)	$\delta_{th}$	[mW/K]: approx. 9*
Thermal cooling time constant (in air)	$\tau_c$	[s]: approx. 75*

\*) typical values

**Remarks**

Torque (mounting): approx. 0,5Nm



**RT-curve:**

R/T-Curve = 2904 / A01

B(25/100) = 4300 K ± 5,0 %

R at 25°C = 10000 Ω

R<sub>N</sub> at 25 °C = 10000 Ω ± 5,0 %

Temp. [°C]	R Nom [Ω]	R Min [Ω]	R Max [Ω]	ΔR [±%]
-55	1.214.589	832.058	1.597.120	31,5
-50	844.390	597.099	1.091.681	29,3
-45	592.433	431.440	753.426	27,2
-40	419.384	313.892	524.875	25,2
-35	299.475	229.943	369.007	23,2
-30	215.673	169.602	261.744	21,4
-25	156.406	125.782	187.029	19,6
-20	114.657	94.169	135.144	17,9
-15	84.510	70.799	98.220	16,2
-10	62.927	53.713	72.140	14,6
-5	47.077	40.901	53.252	13,1
0	35.563	31.420	39.706	11,6
5	27.119	24.343	29.894	10,2
10	20.860	19.009	22.710	8,9
15	16.204	14.980	17.428	7,6
20	12.683	11.887	13.480	6,3
<b>25</b>	<b>10.000</b>	<b>9.500</b>	<b>10.500</b>	<b>5,0</b>
30	7.942	7.446	8.438	6,2
35	6.327	5.859	6.794	7,4
40	5.074	4.642	5.505	8,5
45	4.103	3.709	4.496	9,6
50	3.336	2.982	3.691	10,6
55	2.724	2.407	3.041	11,6
60	2.237	1.955	2.519	12,6
65	1.846	1.595	2.097	13,6
70	1.530	1.308	1.752	14,5
75	1.275	1.079	1.472	15,4
80	1.068	893,9	1.242	16,3
85	899,3	745,2	1.053	17,1
90	760,7	624,1	897,3	18,0
95	645,2	524,2	766,3	18,8
100	549,4	442,0	656,8	19,5
105	470,0	374,6	565,5	20,3
110	403,6	318,6	488,5	21,0
115	347,4	271,8	423,1	21,8
120	300,1	232,6	367,5	22,5
125	260,1	199,8	320,3	23,2

**RELIABILITY DATA :**

<b>Test</b>	<b>Standard</b>	<b>Test conditions</b>	<b><math>\Delta R_{25}/R_{25}</math> (typical)</b>	<b>Remarks</b>
Storage in dry heat	IEC 60068-2-2	Storage at upper category temperature Temperature: 125°C Duration: 1000 h	< 3 %	No visible damage
Storage in damp heat, steady state	IEC 60068-2-78	Temperature of air: 40°C Relative humidity of air: 93 % Duration: 56 days	< 3 %	No visible damage
Endurance		$P_{max}$ : 450 mW Duration: 1000 h	< 3 %	No visible damage

## Cautions and warnings

### Storage

- Store thermistors only in original packaging. Do not open the package before storage.
- Storage conditions in original packaging: storage temperature  $-25^{\circ}\text{C} \dots +45^{\circ}\text{C}$ , relative humidity  $\leq 75\%$  annual mean, maximum 95%, dew precipitation is inadmissible.
- Do not store thermistors where they are exposed to heat or direct sunlight. Otherwise, the packing material may be deformed or components 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 (Sox, Cl etc.)
- After opening the factory seals, such as polyvinyl-sealed packages, use the components as soon as possible.
- Solder thermistors after shipment from EPCOS within the time specified:  
Leaded components: 24 months

### Handling

- NTC thermistors must not be dropped. Chip-offs must not be caused during handling of NTCs.
- Components should 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 thermistors are sealed, potted or overmolded, there must be no mechanical stress caused by thermal expansion during the production process (curing/overmolding process) and during later operation. The upper category temperature of the thermistor must not be exceeded. Ensure that the materials used (sealing/potting compound and plastic material) are chemically neutral.
- Electrodes/contacts must not be scratched before/during/after the mounting process.
- Contacts and housing 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 the temperature.
- Make sure that thermistors (ICLs) are adequately ventilated to avoid overheating.
- Avoid contamination of thermistor surface during processing.
- During mounting and operation tensile forces on the leads are to be avoided.
- Bending or twisting of the leads directly on the thermistor body is not permissible.
- During operation of the sensor in the application, bending or twisting of cables and/or wires is not permissible.

## 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 thermistors (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 unless thermistor is specified for these conditions.
- 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).

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