



NTC thermistors for temperature measurement

NTC Probes

Series/Type: M703/10k/G
Ordering code: B57703M0103G000
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Version: 4

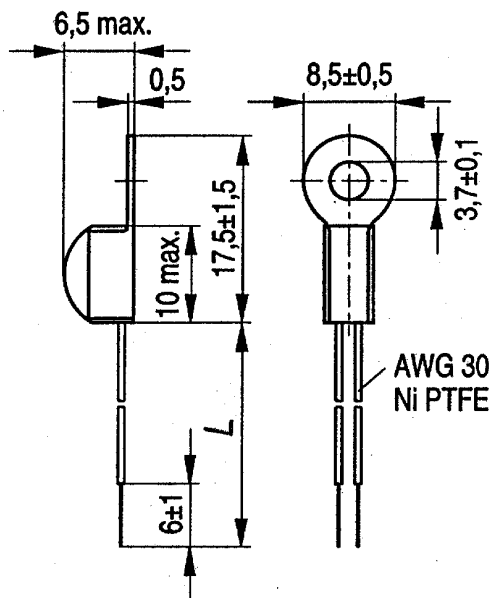
Application

High-accuracy surface temperature measurement, e.g. on housings and pipes

Version

Thermistor encapsulated in metal-tag case.
 (material: brass, tinned)
 leads: silver-plated nickel wire AWG30,
 PTFE insulated

length of wire: $L = 32 \pm 2/-0$ mm
 stripped length: 6 ± 1 mm



Dimensions in mm
 approx. weight 0.8 g

Ratings and characteristics

Climatic Category (IEC 60068-1)		: 55/125/56
Lower category temperature		[°C]: -55
Higher category temperature		[°C]: 125
Rated resistance R_N // Tolerance	R_N	[Ω // %]: 10000 // ± 2
Rated temperature	T_N	[°C]: 25
B-value : $B_{25/100}$ // Tolerance		[K// %]: 3920 // ± 1.5
R/T-Curve no. // R_{25}		[n // Ω]: 2001 // 10000
Power rating at 25°C	P_{25}	[mW]: 150
Dissipation factor (air)	δ_{th}	[mW/K]: approx. 2.6 *
Thermal cooling time constant (air)	τ_c	[s]: approx. 28 *
Heat capacity	C_{th}	[mJ/K]: approx. 73 *
Test voltage (t = 1 s) (between NTC and metal-tag case)		[V _{AC}]: 1000

* typical values, depends on mounting situation

Remarks: Sensor is UL approved, file no. E69802

NTC-RESISTANCE-TEMPERATURE-CURVE

R/T-Curve = 2001 / A01

B(25/100) = 3920 K ± 1.5 %

R at 25°C = 10000 Ω

R_N at 25 °C = 10000 Ω ± 2.0 %

Temp. [°C]	R Nom [Ω]	R Min [Ω]	R Max [Ω]	ΔR [±%]
-55	877624	796160	959088	9,3
-50	619218	565480	672956	8,7
-45	441677	405897	477456	8,1
-40	318332	294304	342361	7,5
-35	231729	215464	247993	7,0
-30	170303	159215	181392	6,5
-25	126207	118605	133809	6,0
-20	94515	89264	99766	5,6
-15	71273	67634	74913	5,1
-10	54270	51734	56806	4,7
-5	41522	39755	43290	4,3
0	32063	30827	33299	3,9
5	25019	24151	25887	3,5
10	19679	19070	20288	3,1
15	15622	15195	16050	2,7
20	12488	12190	12786	2,4
25	10000	9800	10200	2,0
30	8110	7918	8303	2,4
35	6593	6416	6770	2,7
40	5392	5231	5554	3,0
45	4434	4289	4580	3,3
50	3667	3536	3799	3,6
55	3051	2934	3169	3,9
60	2551	2446	2657	4,1
65	2146	2052	2240	4,4
70	1813	1729	1897	4,6
75	1536	1461	1611	4,9
80	1306	1240	1373	5,1
85	1116	1056	1175	5,4
90	956,1	902,7	1009	5,6
95	823,5	775,7	871,2	5,8
100	711,8	669,0	754,6	6,0
105	617,8	579,3	656,2	6,2
110	538,0	503,4	572,6	6,4
115	469,7	438,6	500,8	6,6
120	411,3	383,3	439,4	6,8
125	361,4	336,1	386,7	7,0

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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