NTC Thermistor

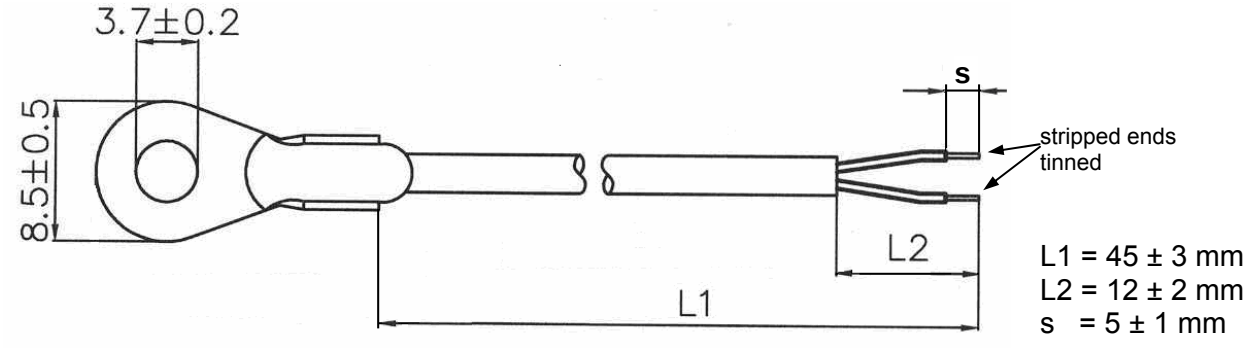
NTC Probes

Series/Type: **M703/5k/2%**
Ordering code: **B57703M0502A004**

Date: 2007-10-02
Version: **1**

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

Version
Thermistor encapsulated in metal-tag case (material: brass, tinned)
wire: AWG 28 stranded (19 x Ø0.07 mm, copper, silver-plated)
Insulation: PTFE, blue



dimensions in mm, tolerances unless specified acc. to DIN ISO 2768-m

No.	Item	Material	Property	Remarks
1	wire	Cu silver-plated	AWG28 (19 x 0.07 mm)	PTFE insulated, blue
2	shrink tube	polyolefine	125°C, UL224, VW-1	black
3	ring tongue	brass, tinned		

Ratings and Characteristics

Climatic Category (IEC 60068-1)		:	**-25/125/56**
Lower category temperature		[°C] :	**-25**
Higher category temperature		[°C] :	**125**
Rated resistance R_N // Tolerance	R_N	[Ω // %] :	**5000 // ± 2**
Rated temperature	T_N	[°C] :	**25**
B-value : $B_{(25/100)}$ // Tolerance	B_N	[K//%]:	**3988 // ± 1**
R/T-Curve no. // R_{25}		[n//Ω]:	**8016 // 5000**
Power rating at 25°C	P_{25}	[mW]:	**150**
Dissipation factor (air)	δ_{th}	[mW/K] :	**approx. 3 ***
Thermal cooling time constant (in air)	τ_C	[s] :	**approx. 50 ***
Heat capacity	C_{th}	[mJ/K] :	**approx. 150 ***
Test voltage between ring tongue and connector pins, AC (50 Hz, 1s)		[V] :	**2500**

* typical values, depends on mounting situation

Remarks: PN 2007/21214

RT-curve:

NTC-RESISTANCE-TEMPERATURE-CURVE

R/T-Curve = 8016 / A01 **B(25/100) = 3988 K ± 1 %**
R at 25°C = 5000 Ω **R_N at 25 °C = 5000 Ω ± 2 %**

Temp. [°C]	R Nom [Ω]	R Min [Ω]	R Max [Ω]	ΔR [±%]	ΔT [±°C]	α [%/K]
-25	65185	62092	68278	4,7	0,8	6,0
-20	48535	46386	50684	4,4	0,8	5,8
-15	36465	34961	37968	4,1	0,7	5,6
-10	27665	26606	28724	3,8	0,7	5,4
-5	21158	20407	21908	3,5	0,7	5,3
0	16325	15790	16860	3,3	0,6	5,1
5	12694	12311	13076	3,0	0,6	5,0
10	9950	9676	10224	2,8	0,6	4,8
15	7854	7656	8051	2,5	0,5	4,7
20	6245	6103	6387	2,3	0,5	4,5
25	**5000**	**4900**	**5100**	**2,0**	**0,5**	**4,4**
30	4029	3937	4120	2,3	0,5	4,3
35	3266	3185	3347	2,5	0,6	4,1
40	2663	2592	2735	2,7	0,7	4,0
45	2184	2121	2247	2,9	0,7	3,9
50	1802	1746	1857	3,1	0,8	3,8
55	1493	1444	1542	3,3	0,9	3,7
60	1244	1201	1287	3,5	1,0	3,6
65	1042	1004	1079	3,6	1,0	3,5
70	876	842,7	909,3	3,8	1,1	3,4
75	740,7	711,3	770,1	4,0	1,2	3,3
80	629	603,0	655,0	4,1	1,3	3,2
85	536,2	513,2	559,2	4,3	1,4	3,2
90	458,8	438,5	479,2	4,4	1,4	3,1
95	394,3	376,1	412,4	4,6	1,5	3,0
100	340	323,9	356,1	4,7	1,6	2,9
105	294,3	279,9	308,7	4,9	1,7	2,9
110	255,6	242,8	268,4	5,0	1,8	2,8
115	222,7	211,2	234,2	5,2	1,9	2,7
120	194,6	184,4	204,9	5,3	2,0	2,7
125	170,8	161,6	180,1	5,4	2,1	2,6

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°C …+45°C, relative humidity ≤ 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.

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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