



NTC thermistors for temperature measurement

Probe assemblies

Series/Type: B57276
Date: March 2006

Applications

- Washing machines
- Dish washers
- Tumble-dryers
- Water boilers

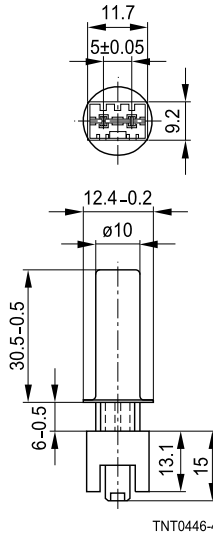
Features

- Suitable for use in corrosive environments
- Compact stainless steel case
- RAST 2.5 plug terminals
- Cost-effective ready-to-use sensor
- UL approval (E69802)

Options

Alternative resistance ratings, rated temperatures and resistance tolerances available on request.

RAST 5 plug terminals available on request.
Type Z276 and Z278 with different geometry and faster response time available on request.

Dimensional drawing


Dimensions in mm
Approx. weight 10 g

Delivery mode

Bulk

General technical data

Climatic category	(IEC 60068-1)		10/100/56	
Max. power	(at 25 °C)	P_{25}	500	mW
Resistance tolerance		$\Delta R_R/R_R$	±2	%
Rated temperature		T_R	60	°C
Dissipation factor	(in water)	δ_{th}	approx. 20	mW/K
Thermal time constant	(in water)	τ_a	approx. 20	s
Heat capacity		C_{th}	approx. 500	mJ/K
Insulation resistance	(V = 100 VDC)	R_{ins}	>1000	MΩ
Test voltage	(t = 1 s)	V_{test}	3750	VAC

Electrical specification and ordering codes

R_{60} Ω	R_{25} Ω	No. of R/T characteristic	$B_{25/100}$ K	Ordering code
3243	11981	2901	3760 ±1.5%	B57276K0123A028

Reliability data

Test	Standard	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in dry heat	IEC 60068-2-2	Storage at upper category temperature T: 100 °C t: 1000 h	< 2%	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	< 1%	No visible damage
Rapid temperature cycling	IEC 60068-2-14	Lower test temperature: -10 °C Upper test temperature: 100 °C Number of cycles: 10	< 1%	No visible damage
Endurance		P_{max} : 500 mW t: 1000 h	< 2%	No visible damage
Long-term stability (empirical value)		Temperature: 100 °C t: 10000 h	< 3%	No visible damage
Robustness of terminations	DIN 46 249	Pull-out force (both connectors together) F = 50 N		No visible damage

R/T characteristics

B57276K0123A028						
R/T No.	2901					
T (°C)	B _{25/100} = 3760 K, R ₂₅ = 11981 Ω, T _R = 60 °C, ΔR _R /R _R = ± 2%					
	R _{nomL} [Ω]	R _{minL} [Ω]	R _{maxL} [Ω]	ΔR _R /R _R [±%]	ΔT[±°C]	α (%/K)
-10.0	58723	54875	62572	6.6	1.3	5.0
-5.0	45779	42962	48597	6.2	1.3	4.9
0.0	35976	33900	38051	5.8	1.2	4.7
5.0	28517	26977	30056	5.4	1.2	4.6
10.0	22763	21616	23910	5.0	1.1	4.5
15.0	18279	17421	19137	4.7	1.1	4.3
20.0	14773	14129	15417	4.4	1.0	4.2
25.0	11981	11497	12465	4.0	1.0	4.1
30.0	9786	9421	10150	3.7	0.9	4.0
35.0	8047	7772	8323	3.4	0.9	3.9
40.0	6653	6444	6861	3.1	0.8	3.8
45.0	5523	5365	5680	2.8	0.8	3.7
50.0	4608	4489	4726	2.6	0.7	3.6
55.0	3856	3767	3945	2.3	0.7	3.5
60.0	3243	3178	3308	2.0	0.6	3.4
65.0	2744	2681	2808	2.3	0.7	3.3
70.0	2333	2273	2392	2.5	0.8	3.2
75.0	1990	1934	2045	2.8	0.9	3.2
80.0	1704	1653	1755	3.0	1.0	3.1
85.0	1464	1416	1511	3.2	1.1	3.0
90.0	1262	1218	1305	3.4	1.2	2.9
95.0	1093	1053	1133	3.7	1.3	2.9
100.0	949.9	913.2	986.6	3.9	1.4	2.8

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_x, 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.

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

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