DATA SHEET

Precision temperature sensor
TS-NTC-833

Description

Technical Data

Precision temperature sensor SEMI833ET	
Measuring principle	NTC
Measuring range	-40 ... +100 °C
Nominal resistance at 37 °C	min. 48561 Ω max. 51265 Ω
Tolerance in resistance values at 37 °C	±0.2 % *
Gain-tolerance R_{30}/R_{45}	±1 %
Long term stability	better than 1 %
Response time T_{66} in oil	700 ms
Self heating	1.42 °C/mW
Dimensions ∅ x L	1.5 x 4 mm
Insulation resistance	100 MΩ
Ordering No.	TS-NTC-833 (18 85 06)
* For large order quantities, 12 selected classes can be delivered.	
Rights reserved for change in technical data due to technological advancements!	

Characteristic features

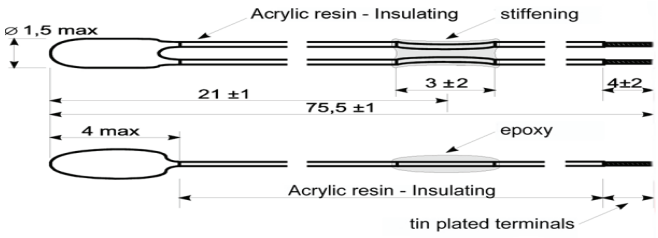
- Wide measuring range –40 °C to 100 °C
- Extremely fast response time 0.7 seconds
- Offset at 37 °C within close tolerance ±0.2 %
- Replaceable without re-calibration
- High sensitivity
- Simple evaluation electronics
- Outstanding long term stability

Typical areas of application

- Medical systems
- Industrial instrumentation
- Temperature probes
- Building instrumentation
- Air conditioning systems

Features

The NTC temperature sensor SEMI 833 ET has been specially developed for application in precision electronic thermometers, e.g. for medical applications (clinical thermometer). The component also has outstanding long-term stability and is very well suitable for industrial thermometers which can be calibrated.
The temperature sensors are so closely tolerated that adequate measuring accuracy can be achieved in many applications without the need of re-calibration. In high accuracy requirements, normally a single point calibration is good enough.



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In comparison to other temperature sensors, this component offers a substantially higher sensitivity, because of which the circuit development expenses are minimum. It has a very high nominal resistance of 103.6 k-Ohm at 20 °C, due to which the power consumption of measuring circuit is very low and this avoids self heating. With the help of a parallel resistance, the exponential characteristics of the component can be pre-linearised.
Because of the low thermal mass, the response time(T66) is very fast, i.e. 0.7 seconds.

Resistance table

The ITS90 values are as per the following resistance table. The tolerance in temperature values is maximum ±0.05 °C. The resistance values mentioned are average values from different production batches.
Extensive data on the sensor are available in the form of EXCEL-charts. Further information on measuring circuits or linearising techniques is available on request!

Temperature	Resistance max	Resistance nominal	Resistance min	Gradient	Accuracy
-40 °C	2841 kΩ	2664 kΩ	2496 kΩ	170 kΩ / °C	-1.0 /+1.0 K
-35 °C	2055 kΩ	1933 kΩ	1817 kΩ	121 kΩ / °C	-1.0 /+1.0 K
-30 °C	1506 kΩ	1421 kΩ	1340 kΩ	86 kΩ / °C	-1.0 /+1.0 K
-25 °C	1112 kΩ	1052 kΩ	995.2 kΩ	62 kΩ / °C	-1.0 /+1.0 K
-20 °C	830.7 kΩ	788.5 kΩ	747.8 kΩ	45.0 kΩ / °C	-1.0 /+1.0 K
-15 °C	624.5 kΩ	594.4 kΩ	565.4 kΩ	33.0 kΩ / °C	-0.9 /+1.0 K
-10 °C	474.5 kΩ	453.0 kΩ	432.0 kΩ	24.3 kΩ / °C	-0.9 /+0.9 K
-5 °C	363.1 kΩ	347.6 kΩ	332.3 kΩ	18.0 kΩ / °C	-0.9 /+0.9 K
0 °C	280.6 kΩ	269.3 kΩ	258.1 kΩ	13.6 kΩ / °C	-0.9 /+0.9 K
5 °C	218.0 kΩ	209.7 kΩ	201.6 kΩ	10.3 kΩ / °C	-0.8 /+0.6 K
10 °C	170.9 kΩ	164.8 kΩ	158.8 kΩ	7.8 kΩ / °C	-0.8 /+0.8 K
15 °C	134.6 kΩ	130.1 kΩ	125.7 kΩ	6.0 kΩ / °C	-0.8 /+0.8 K
20 °C	106.9 kΩ	103.6 kΩ	100.3 kΩ	4.7 kΩ / °C	-0.8 /+0.8 K
25 °C	85.49 kΩ	83.00 kΩ	80.51 kΩ	3.63 kΩ / °C	-0.7 /+0.7 K
30 °C	69.06 kΩ	66.91 kΩ	64.76 kΩ	2.85 kΩ / °C	-0.8 /+0.8 K
35 °C	56.05 kΩ	54.19 kΩ	52.34 kΩ	2.24 kΩ / °C	-0.9 /+0.9 K
40 °C	45.80 kΩ	44.18 kΩ	42.59 kΩ	1.79 kΩ / °C	-0.9 /+1.0 K
45 °C	37.57 kΩ	36.17 kΩ	34.80 kΩ	1.42 kΩ / °C	-1.0 /+1.0 K
50 °C	31.01 kΩ	29.80 kΩ	28.61 kΩ	1.14 kΩ / °C	-1.1 /+1.0 K
55 °C	25.7 kΩ	24.65 kΩ	23.63 kΩ	0.92 kΩ / °C	-1.2 /+1.2 K
60 °C	21.43 kΩ	20.51 kΩ	19.62 kΩ	0.75 kΩ / °C	-1.2 /+1.3 K
65 °C	17.92 kΩ	17.13 kΩ	16.35 kΩ	0.60 kΩ / °C	-1.3 /+1.4 K
70 °C	15.07 kΩ	14.37 kΩ	13.70 kΩ	0.50 kΩ / °C	-1.4 /+1.4 K
75 °C	12.71 kΩ	12.10 kΩ	11.52 kΩ	0.41 kΩ / °C	-1.5 /+1.5 K
80 °C	10.77 kΩ	10.24 kΩ	9.728 kΩ	0.34 kΩ / °C	-1.6 /+1.6 K
85 °C	9.165 kΩ	8.700 kΩ	8.251 kΩ	0.280 kΩ / °C	-1.7 /+1.7 K
90 °C	7.829 kΩ	7.419 kΩ	7.025 kΩ	0.234 kΩ / °C	-1.8 /+1.8 K
95 °C	6.712 kΩ	6.351 kΩ	6.004 kΩ	0.195 kΩ / °C	-1.8 /-1.9 K
100 °C	5.779 kΩ	5.460 kΩ	5.153 kΩ	0.164 kΩ / °C	-1.9 /+2.0 K

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