

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 $\varnothing \times L$	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.	
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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

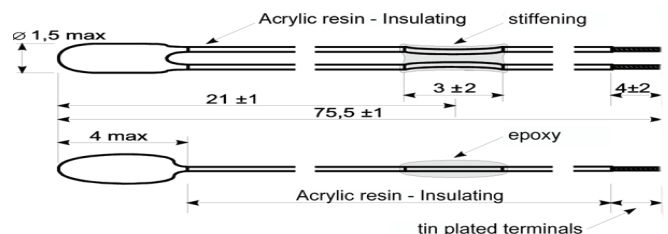
Typical areas of application

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