Temperature (NTC)
Sensor Data Sheet

NTC 12072017

SPECIFICATIONS

> **Range:** 0-50ºC
> **Type:** NTC thermistor
> **Diameter:** 2.04mm
> **Response Time (Air):** 15 seconds
> **Response Time (Water):** 2 seconds

FEATURES

> Medical-grade PVC insulation
> Fast response
> Pre-conditioned analog output
> High signal-to-noise ratio
> Ready-to-use form factor

APPLICATIONS

> Life sciences studies
> Biomedical research
> Human-Computer Interaction
> Robotics & Cybernetics
> Physiology studies
> Psychophysiology
> Biomechanics
> Ergonomics

GENERAL DESCRIPTION

Our high performance NTC sensors have been specifically developed for biomedical applications, and are meant to be used on a range of temperatures suitable for body sensing. These sensors produce a robust, stable, and accurate output with low tolerance values. The geometry and rapid response are also of added value for even the most demanding applications.

Fig. 1. Integrated miniaturized sensor + cable assembly providing unrivalled usability.

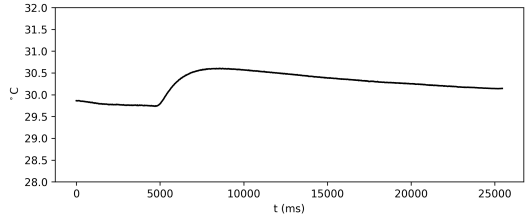

Fig. 2. Example temperature (NTC) sensor data.

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REV A

BEWARE: DIRECT OR INDIRECT COUPLING TO THE MAINS MAY RESULT IN SHOCKING HAZARD

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TRANSFER FUNCTION

$$NTC(V) = \frac{ADC.VCC}{2^n}$$

$$NTC(\Omega) = \frac{1\times10^4.NTC(V)}{VCC - NTC(V)}$$

$$TMP(°K) = \frac{1}{a_0 + a_1.\log\big(NTC(\Omega)\big) + a_2.\big[\log\big(NTC(\Omega)\big)\big]^3}$$

$$TMP(°C) = TMP(°K) - 273{,}15$$

$VCC = 3.3V$ (operating voltage)
$a_0 = 1{,}12764514\times10^{-3}$
$a_1 = 2{,}34282709\times10^{-4}$
$a_2 = 8{,}77303013\times10^{-8}$

$NTV(V)$ – NTC output in Volt (V)
$NTC(\Omega)$ – NTC resistance in Ohm (Ω)
$TMP(°K)$ – Temperature value in Kelvin (*°K*)
$TMP(°C)$ – Temperature value in Celsius (*°C*)
ADC – Value sampled from the channel
n – Number of bits of the channel[1]

[1] The number of bits for each channel depends on the resolution of the Analog-to-Digital Converter (ADC); in BITalino the first four channels are sampled using 10-bit resolution ($n = 10$), while the last two may be sampled using 6-bit ($n = 6$).