Temperature (NTC)
Sensor Data Sheet

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.

PLUX – Wireless Biosignals, S.A.
Av. 5 de Outubro, n. 70 – 8.
1050-059 Lisbon, Portugal
bitalino@plux.info
http://bitalino.com/

REV A
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BEWARE: DIRECT OR INDIRECT COUPLING TO THE MAINS MAY RESULT IN SHOCKING HAZARD
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**TRANSFER FUNCTION**

\[
NTC(V) = \frac{ADC \cdot VCC}{2^n}
\]

\[
NTC(\Omega) = \frac{1 \times 10^4 \cdot NTC(V)}{VCC - NTC(V)}
\]

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

\[
TMP(°C) = TMP(°K) - 273,15
\]

\[VCC = 3.3 \text{V (operating voltage)}\]
\[a_0 = 1.12764514 \times 10^{-3}\]
\[a_1 = 2.34282709 \times 10^{-4}\]
\[a_2 = 8.77303013 \times 10^{-8}\]

NTV (V) – NTC output in Volt (V)
NTC (\Omega) – NTC resistance in Ohm (\Omega)
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\(^1\)

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\(^1\) 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).