Graphite strain sensor

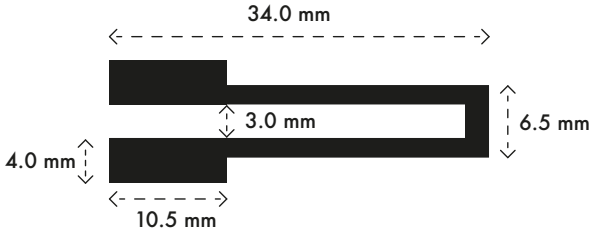
Based on « Pencil Drawn Strain Gauges and Chemiresistors on Paper »[1]

Made at INSA Toulouse (France)

Features

- *Low-tech sensor*
- *Low-cost*
- *Printable and Replaceable*
- *Eco-friendly*
- *Portable*

Dimensions



Description

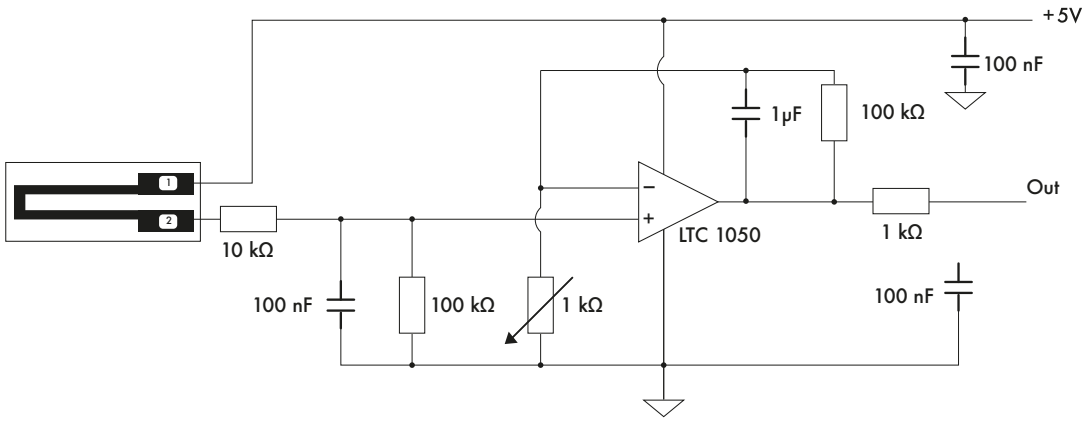
This graphite strain sensor is a low-tech strain sensor based on the paper « Pencil Drawn Strain Gauges and Chemiresistors on Paper » (Zang et al., 2015)[1]. It was made by students at INSA Toulouse from the physical engineering department as part of a Sensor Project.

The sensor is made by depositing graphite onto a 80 gsm office paper. Therefore, a conductance property appears on this graphite granular system due to the various size of graphite grains spaced at an inter-grain distance.

When folding the paper, the inter-grain distance change, which change exponentially the conductance. This variations can be measured in order to recover the initial stress applied.

1. Zang, X., Zhang, F., Di, C., & Zhu, D. (2015). Pencil drawn strain gauges and chemiresistors on paper. Scientific Reports, 5, Article 10921. https://doi.org/10.1038/srep10921

Typical Application



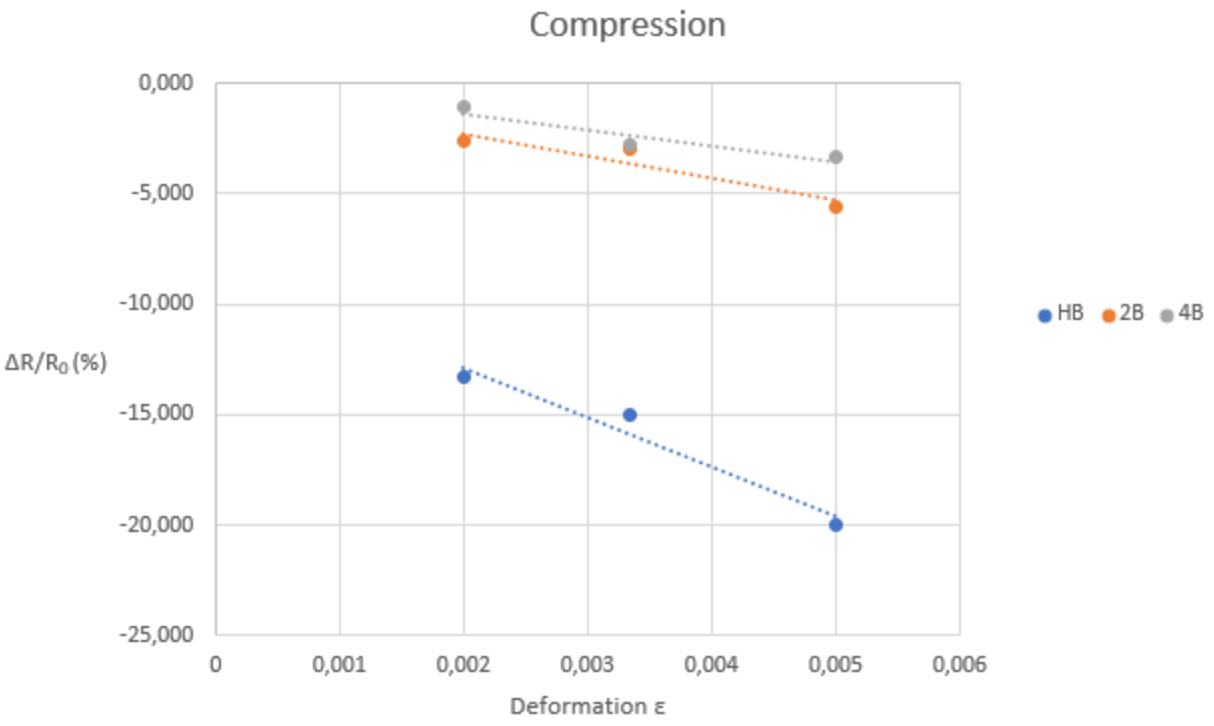
Ratings

Parameter	Rating
V_{cc}	5V
Lifetime	5 to 20 uses
Temperature	0°C to 50 °C
Pencil Tone	HB to 4B

Specifications

Pencil Tone	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{cc}	4.0	5.0	6.0	V
HB	R	6.5	6	7	MΩ
2B	R	2.2	3.4	4.1	MΩ
4B	R	0.8	0.9	1.2	MΩ

Characteristic in compression



Characteristic in Relaxation