

## Accepted Manuscript

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PII: S0924-4247(17)31751-X  
DOI: <https://doi.org/10.1016/j.sna.2018.02.014>  
Reference: SNA 10636

To appear in: *Sensors and Actuators A*

Received date: 28-9-2017  
Revised date: 13-1-2018  
Accepted date: 8-2-2018

Please cite this article as: Banerjee A, Satoh H, Sharma Y, Hiromoto N, Inokawa H, Characterization of Platinum and Titanium Thermistors for Terahertz Antenna-Coupled Bolometer Applications, *Sensors and Actuators: A Physical* (2010), <https://doi.org/10.1016/j.sna.2018.02.014>

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# Characterization of Platinum and Titanium Thermistors for Terahertz Antenna-Coupled Bolometer Applications

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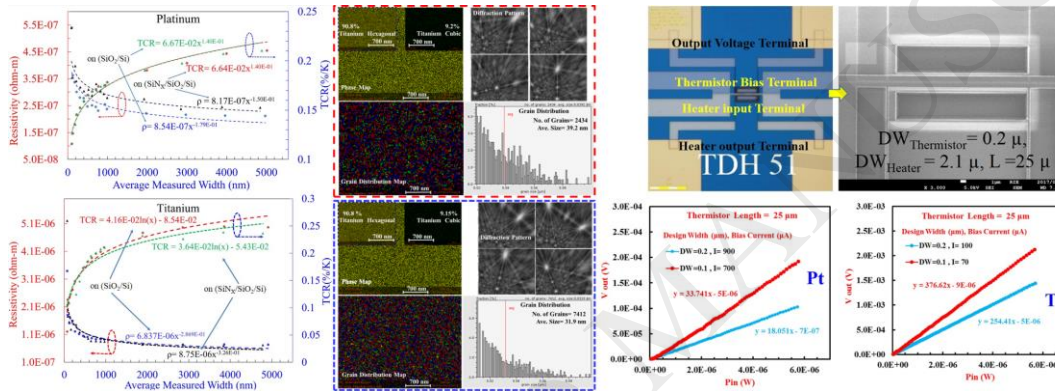
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## Graphical abstract



## Highlights

- Microbolometer is a radiation detector for infrared (IR) and terahertz (THz) waves
- Responsivity is proportional to temperature coefficient of resistance of thermistor
- Narrow-width effects on TCR and resistivity of Pt & Ti thermistor are investigated
- Device with Ti thermistor has higher responsivity than with Pt thermistor
- Device with Ti thermistor width of 0.1  $\mu\text{m}$  has higher responsivity than width 0.2  $\mu\text{m}$

## Abstract:

Microbolometer is a radiation detector for infrared (IR) and terahertz (THz) waves. The temperature coefficient of resistance (TCR) of the thermistor is a vital factor, as the responsivity is proportional and noise equivalent power (NEP) is inversely proportional to it. The narrow-width effect on TCR and resistivity on two different substrates ( $\text{SiO}_2/\text{Si}$  and  $\text{SiN}_x/\text{SiO}_2/\text{Si}$ ) for platinum (Pt) and titanium (Ti) thermistor with various design width (DW)= 0.1~5  $\mu\text{m}$  are investigated. Increased resistivity and reduced TCR of the devices with the decreased line width, is observed commonly for both metal and fitted with

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