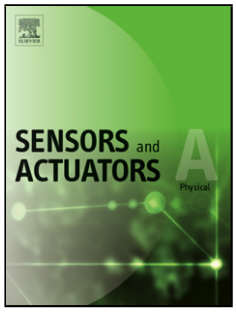

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Characterization of Platinum and Titanium Thermistors for Terahertz Antenna-Coupled Bolometer Applications

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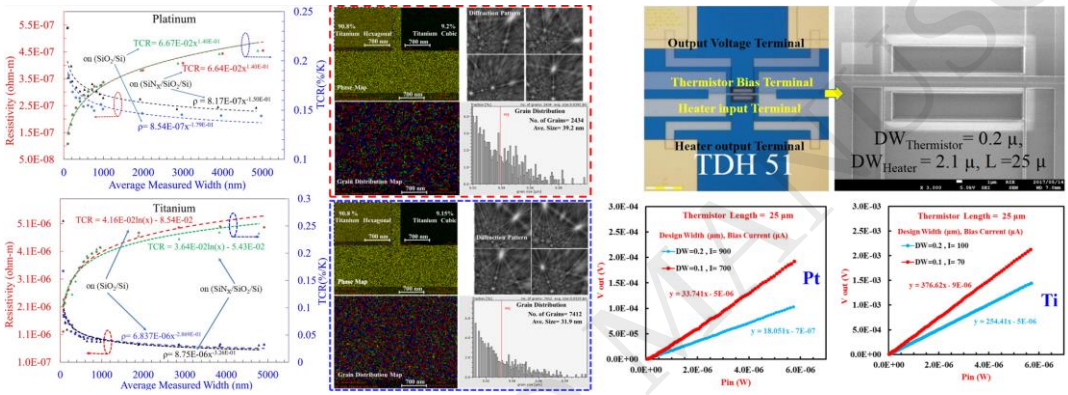
Graphical abstract



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 µm has higher responsivity than width 0.2 µm

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 (SiO_2/Si and SiN_X/SiO_2/Si) for platinum (Pt) and titanium (Ti) thermistor with various design width (DW)= 0.1~5 µm are investigated. Increased resistivity and reduced TCR of the devices with the decreased line width, is observed commonly for both metal and fitted with