



CMOS Compatible Electrostatically Formed Nanowire Transistor for Efficient Sensing of Temperature

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Abstract

A novel electrostatically formed nano-wire (EFN) transistor for temperature sensing is presented. The device is a silicon-on-insulator multigate field-effect transistor, in which a nanowire-shaped conducting channel vertical position and area are controlled by the bias applied to the back gate, and two junction-side gates. Our measurements depict temperature sensitivity of 7.7%/K for EFN transistors which is among the best reported values for semiconductor temperature sensing devices. Optimal operational regimes for the fabricated EFN transistors are analyzed and discussed using 3-D electrostatic device simulations and an analytical model.

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