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Abstract

Temperature Reliability study on Double Gate Tunnel Field Effect Transistor

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Abstract:

In the present research work, we report the temperature reliability issues of hetero - structure double gate (het-DG) tunneling field-effect transistor (TFET). Temperature reliability is one of the biggest issues of all semiconductor devices due to strong dependency of semiconductors with temperature. In the present research work, we have adopted a double gate tunnel FET having two semiconductors Si and GaAs channel materials. In this work, we have compared the temperature effect on hetero-structure (Si/GaAs) and homostructure (Si) based double (DG) TFET. We have also studied the variation of different device parameters such as gate oxide material and gate work function. The comparison of TFET characteristics and temperature sensitivity is done with a high-k and SiO2 as gate dielectric materials. From obtained results, it has been observed that hetero structure double TFET is insensitive with temperature variations. This is an indication of excellent future in low power applications with TFETs.

Biography:

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Publication of speakers:

1. Guenifi, N. & Mahamdi, Radane & Rahmani, I.. (2017). Boron Phosphorus and Arsenic Diffusion in MOS transistors: Simulation and Analyze in Both 2D and 3D. Phosphorus, Sulfur, and Silicon and the Related Elements. 193. 10.1080/10426507.2017.1417304.
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3. Guenifi, N. & Bauza, D. & Mahamdi, Radane. (2017). Characterizing Slow state Near Si-SiO 2 in MOS structure. Phosphorus, Sulfur, and Silicon and the Related Elements. 193. 00-00. 10.1080/10426507.2017.1417303.
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