

Representation of a high performance junctionless transistor based on semiconductors heterostructures of groups IV and III-V

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In this research, a junctionless tunnel field effect transistor (JLTFET) is simulated. Using the idea of heterostructure of compound, the source of this device was suggested by silicon. The results showed better on-state current. Accordingly, the convert of drain into GaAs and further the structures with source and channel germanium and then drain GaAs, channel silicon and source germanium were proposed, simulated and analyzed. Specifically, the device with germanium source due to the improvement of source-channel and drain conditions has excellent performance in terms of high on-state and low off-state current. So the JLTFET with the structure of GaAs-Si-Ge is suggested by this research.

Keywords : On-state current, Off-state current, JLTFET, Heterostructure.

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