

عنوان مقاله:

Study of Quantum Transport in Nanoscale Double Gate Schottky SOI MOSFET on Arbitrarily Orientated Wafers: Non-equilibrium Green's Function Formalism

محل انتشار:

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خلاصه مقاله:

A comprehensive study of Schottky barrier MOSFET (SBMOSFET) scaling issue is performed to determine the role of wafer orientation and structural parameters on the performance of this device within Nonequilibrium Green's Function (NEGF) formalism. Quantum confinement increases the effective Schottky barrier height (SBH). (100) orientation provides lower effective Schottky barrier height in comparison with (110) and (111) wafers. As the channel length of ultrathin body SBMOSFET scales down to nanoscale regime, especially for high effective SBHs, quantum confinement is created along the channel and current propagates through discrete resonance states. We have studied the possibility of resonant tunneling in SBMOSFET. Resonant tunneling for (110) and (111) orientations appear at higher gate voltages.

کلمات کلیدی:

Schottky MOSFET, quantum transport, mode space approach, Non-equilibrium Green's Function (NEGF) formalism, resonant tunneling

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