

Review of: "FinFET nanotransistor, the reduction of scale causes more short channel effects, less gate control, an exponential increase in leakage currents, severe process changes, and power densities"

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FinFET devices, compared to flat technology and using nanowires in the structure (complementary metal oxide semiconductor), have significantly faster switching and higher current density. Due to the reduction of the scale of semiconductor components and integrated circuits to the nanometer range, in the FinFET nanotransistor, the reduction of scale causes more short channel effects, less gate control, an exponential increase in leakage currents, severe process changes, and power densities to become unmanageable.

The connection between the carbon and metal nanotubes used to connect the source and the drain forms the Schottky barrier (SB) in a FinFET nanotransistor. The formation of Schottky barriers in the source and drain of a transistor causes a significant decrease in the drain current of FinFET nanotransistors. Therefore, for the higher operational efficiency of FinFET nanotransistors, suitable metals are needed that can be used in the source and drain junctions of the nanotransistor and create an ohmic connection. The ability of carbon nanotubes to be used in FinFET nanotransistors is hollow and high, being their contact surface. This contact surface consists of the outer wall of the nanotube and its empty middle parts. In FinFET nanotransistors, when an electric field is applied, the carbon nanotube located between the source and drain contains the moving charge. It becomes. The density of these charges is 5 for the source, and this density is determined by the electric conduction in the multi-layered nanotubes; for 6, there is also a possibility of a Fermi-Dirac distribution. a

Conclusion :

Since FinFET nanotransistors aim to reach a larger discharge current in the nanotransistor, the width of the channel, according to the height as well as the thickness of the layers of nano CNTs, is kept in a smaller range.

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