

## عنوان مقاله:

Improvement of Tunnel Field Effect Transistor Performance Using Auxiliary Gate and Retrograde Doping in the Channel

## محل انتشار:

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## خلاصه مقاله:

In this work, a dual workfunction gate-source pocket-retrograde doping-tunnel field effect transistor (DWG SP RD-TFET) is proposed and investigated. DWG SP RD-TFET is a Silicon-channel TFET with two isolated metal gates (main gate and auxiliary gate) and a source pocket in the channel close to the source-channel junction to increase the carrier tunneling rate. For further enhancement in the tunneling rate, source doping near the source-channel junction, i.e., underneath the auxiliary gate is heavily doped to create more band bending in energy band diagram. Retrograde doping in the channel along with auxiliary gate over the source region also improve device subthreshold swing and leakage current. Based on our simulation results, excellent electrical characteristics with ION/IOFF ratio  $> 10^9$ , point subthreshold swing (SS) of 6 mV/dec and high gm/ID ratio at room temperature shows that this tunneling FET can be a promising device for low power applications.

## کلمات کلیدی:

Tunnel Field Effect Transistor (TFET), subthreshold swing (SS), source pocket, isolated gates, retrograde doping

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