Abstract

To manage the increasing static leakage in low power applications and reduced Ion/Ioff due to aggressive scaling of MOS transistors, Tunnel FET (TFET) devices are considered as the most promising candidates because of their excellent immunity against such important short channel effects. Solutions for leakage reduction as well as improving on current of the device are sought at the device design and process technology levels. In this paper, we propose a novel design
for a hetero double gate dielectric tunnel field effect transistor (HDG-TFET). Simulation of this
device characteristics show significant improvement over conventional double gate devices with
high K only gate dielectric TFET. In this device, a low K gate oxide is used at the drain end and
a high K gate oxide is used at the source end with low band gap material in source region.
Ambipolar behavior at the drain end can be suppressed and a record high Ion/loff of the order of
10 13 is achieved.

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Index Terms

Computer Science Wireless

Key words

AMBIPOlar TRANSPORT
HETRO-GATE-DIELECTRIC
BAND-TO-BAND TUNNELING
Hetero Double Gate-dielectric Tunnel FET with record high ION/IOFF ratio