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INFLUENCE OF MIXED OXIDE INTERFACIAL LAYER ON THE RESPONSE CHARACTERISTICS OF SUBMICRON ALGAAS PRACTICAL MESFET

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Abstract

The role of the Schottky barrier interfacial layer on submicron AlGaAs-GaAs MESFET due to the formation of the unwanted thin atomic oxide layer between gate metal and the compound semiconductor is studied in this paper. The GaAs-on-Si wafers generates some drawbacks: - Mean surface quality, higher dislocation density, auto doping of Silicon. The buffer layer has been modified using an epitaxial layer of $SrTiO_3$.The variation of threshold voltage, the device conductance and output conductance with the thickness of the interfacial layer are investigated here. The change of mobility (μ_{ox}) with the Gate-to-Source voltage is also studied. A reasonable explanation is also given for the reduction of the barrier height.

Keywords: MESFET, mobility, high K interfacial layer, doping density