An Analytical Potential Model for Normally on P-type Double Gate Junctionless Field Effect Transistor

Angshumala Talukdar

Department of Instrumentation Engineering, Central Institute of Technology Kokrajhar, India

Kaushik Chandra Deva Sarma

Department of Instrumentation Engineering, Central Institute of Technology Kokrajhar, India

Abstract:

Electrostatic potential is one of the most important parameters of a device. An analytical expression for potential variation in the body of a Normally on p-type Double gate Junctionless field effect transistor (JLFET) is presented. The work function of gate is higher than channel in a normally on P device. In the Normally on P version of JLFET a positive electric field at the gate accomplishes the turn off process of the device . The mathematical models for all three regions of the body of the device are obtained solving Poisson's equation under the assumption that the complete body conducts current at zero gate field. The validity of the expression for potential in the device has been checked by checking the closeness of the potential curve obtained from the model and that obtained from TCAD simulator.

Keywords:

Junctionless, Field effect, Potential, Work function, Normally on.