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| **Title:** | Inversion Layer Effective Mobility Model for Pocket Implanted Nano Scale n-MOSFET | | |
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| **Abstract:** |  |
| Abstract— Carriers scattering in the inversion channel of n- MOSFET dominates the drain current. This paper presents an effective electron mobility model for the pocket implanted nano scale n-MOSFET. The model is developed by using two linear pocket profiles at the source and drain edges. The channel is divided into three regions at source, drain, and central part of the channel region. The total number of inversion layer charges is found for these three regions by numerical integration from source to drain ends and the number of depletion layer charges is found by using the effective doping concentration including pocket doping effects. These two charges are then used to find the effective normal electric field, which is used to find the effective mobility model incorporating the three scattering mechanisms, such as Coulomb, phonon, and surface roughness scatterings as well as the ballistic phenomena for the pocket implanted nano-scale n-MOSFET. The simulation results show that the derived mobility model produces the same results as found in the literature. | |