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| **Title:** | Analytical Subthreshold Drain Current Model Incorporating Inversion Layer Effective Mobility Model for Pocket Implanted Nano Scale n-MOSFET | | |
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| **Abstract:** |  |
| Abstract— Carrier scatterings in the inversion channel of MOSFET dominate the carrier mobility and hence drain current. This paper presents an analytical model of the subthreshold drain current incorporating the effective electron mobility model of the pocket implanted nano scale n-MOSFET. The model is developed by assuming two linear pocket profiles at the source and drain edges at the surface and by using the conventional drift-diffusion equation. Effective electron mobility model includes three scattering mechanisms, such as Coulomb, phonon, and surface roughness scatterings as well as ballistic phenomena in the pocket implanted n-MOSFET. The model is simulated for various pocket profile and device parameters as well as for various bias conditions. Simulation results show that the subthreshold drain current data matches the experimental data already published in the literature. | |