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| **Title:** | Temperature Effects on Threshold Voltage of the Pocket Implanted Fully Depleted Thin Film SOI n-MOSFET | | |
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| **Abstract:** |  |
| Abstract— Pocket implantation in the bulk-MOS device causes the Reverse Short Channel Effect (RSCE) that suppresses the Short Channel Effect (SCE). Silicon-On- Insulator (SOI) structure of MOS device has attracted much attention due to improved isolation, reduced parasitic capacitance and enhanced radiation hardness as compared to bulk MOS devices. But this device also suffers from SCE. Therefore, a modified structure of the fully depleted thin film SOI n-MOSFET has been proposed by incorporating the pocket implants both at the source and drain sides to combat SCE. Threshold voltage depends on various temperature dependent parameters like flat band voltage, Fermi potential and depletion layer charge. In this paper, temperature effects on the threshold voltage of the pocket implanted fully depleted thin film SOI n- MOSFET has been studied through simulations. It is observed from simulated results that the threshold voltage increases with decreasing temperature. The pocket profile is based on two linear doping profiles along the channel. So, the simulated results are compared with the results obtained using two different pocket profiles found in the literature incorporating them in the threshold voltage model of the SOI n-MOSFET. The proposed model can be useful in low temperature operation. | |