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| **Title:** | The Surface-Potential-Based model HiSIM -SOI and its Application to 1/f Noise in Fully-Depleted SOI-MOSFETs | | |
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| **Abstract:** |  |
| Abstract— The fully-depleted SOI-MOSFET model HiSIM-SOI for circuit simulation is the first model for circuit simulation based on a complete surface-potential description. HiSIM-SOI solves the surface potentials at all three SOI-surfaces perpendiculars to the channel surface self-consistently. Besides, verification against measured I-V characteristics, HiSIM-SOI is also verified with a 1/f noise analysis, sensitive to the carrier concentration and distribution along the channel. During the noise analysis, it was found that the carrier concentration increase in SOI-MOSFET leads to an enhanced 1/f noise in comparison with the bulk-MOSFET. Therefore, HiSIM-SOI predicts that further reduction of the silicon-layer thickness necessary for achieving higher driving capability will cause unavoidable noise enhancement. | |