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BOX Effect Sensitivity to Fin Width in SOI-Multi-FinFETs

Authors : A. N. Moulai Khatir

Abstract : SOI-Multifin-FETs are placed to be the workhorse of the industry for the coming few generations, and thus, in a few years because their excellent transistor characteristics, ideal sub-threshold swing, low drain induced barrier lowering (DIBL) without pocket implantation, and negligible body bias dependency. The corner effect may also exist in the two lower corners; this effect is called the BOX effect, which can also occur in the direction X-Z. The electric field lines from the source and drain cross the bottom oxide and arrive in the silicon. This effect is also called DIVSB (Drain Induced Virtual Substrate Basing). The potential in the silicon film in particular near the drain is increased by the drain bias. It is similar to DIBL and result in a decrease of the threshold voltage. This work provides an understanding of the limitation of this effect by reducing the fin width for components with increased fin number.

Keywords : SOI, finFET, corner effect, dual-gate, tri-gate, BOX, multi-finFET
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