

Ultra-Thin Body PMOSFETs with Selectively Deposited Ge Source/Drain

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Abstract

Nanoscale Ultra-Thin Body (UTB) PMOSFETs with body thickness down to 4nm and selectively deposited Ge raised source and drain (S/D) are demonstrated for the first time. A selective Ge deposition provides a self-aligned process and lower thermal budget process. Devices with gate length down to 30nm show excellent short-channel behavior. Hole mobility enhancement and threshold-voltage increase for NMOS and PMOS are observed with decreasing UTB thickness due to the quantum confinement of inversion charge causing degenerated sub-bands splitting.