

Fabrication of a Novel Vertical pMOSFET with Enhanced Drive Current and Reduced Short-Channel Effects and Floating Body Effects

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ABSTRACT

We have fabricated, for the first time, a novel vertical p-channel metal-oxide-semiconductor field-effect transistor (MOSFET), so called high mobility hetero-junction transistor (HMHJT). Significantly reduced short channel effects and floating body effects, and enhanced drive current have been achieved. Compared to a Si control device, the fabricated p-HMHJT has a 1.65X higher drive current ($V_{DS} = -1.6$ V and $V_G - V_T = -2$ V), and a 70X lower off-state leakage ($V_{DS} = -1.6$ V).