<100> Channel Strained-SiGe p-MOSFET with Enhanced Hole Mobility and Lower Parasitic Resistance

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Employment of <100> channel direction in a strained-$Si_{0.8}Ge_{0.2}$ p-MOSFET has demonstrated the substantial amount of hole mobility enhancement as large as 25% and parasitic resistance reduction of 20% compared to a <110> strained-$Si_{0.8}Ge_{0.2}$ channel p-MOSFET, which already has an advantage in mobility and the threshold voltage roll-off characteristic over the Si p-MOSFET. This result indicates that the <100> strained SiGe channel p-MOSFET is a promising and practical candidate for realizing high-speed CMOS devices under low-voltage operation.