

110 GHz cutoff frequency of ultra-thin gate oxide p-MOSFETs on (110) surface-oriented Si substrate

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The DC and RF analog characteristics of ultra-thin gate oxide CMOS on (110) surface-oriented Si substrate were investigated for the first time. G_m of p-MOSFET on (110) substrate is 1.9 times greater than that on (100) substrate even in gate oxides in direct-tunneling regime. Extremely high cutoff frequency of 110 GHz was obtained in 0.11 μm gate length p-MOSFET with 1.5 nm gate oxide.