ABSTRACT

Improved Performance of Ultra-Thin HfO_2 CMOSFETs Using Poly-SiGe Gate

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Poly-SiGe is investigated as the gate material for CMOS transistors with ultra-thin HfO_2 gate dielectric. Compared with poly-Si, poly-SiGe reduces the gate depletion effect, and also results in thinner EOT of the gate dielectric after 1000°C annealing, with low gate leakage maintained. The Si interface quality is also better than that achieved with surface nitridation, which has been used to reduce EOT. Therefore, the use of poly-SiGe as the gate material is effective for improving the performance of ultra-thin HfO_2 CMOS transistors.