

Effects of High-Temperature Forming Gas Anneal on HfO₂ MOSFET Performance

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Abstract

Effects of forming gas (FG) annealing on HfO₂ MOSFET performance have been studied. High-temperature (500-600°C) FG annealing has been shown to significantly improve carrier mobility and subthreshold slopes for both N and PMOSFET's. The improvement has been correlated to the reduction in interfacial state density. The effectiveness of FG annealing has also been examined on samples that underwent surface preparations with NH₃ or NO annealing prior to HfO₂ deposition. It was found that FG annealing did not degrade PMOS negative bias temperature instability characteristics.