

Very Low Defects and High Performance Ge-On-Insulator p-MOSFETs with Al₂O₃ Gate Dielectrics

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Abstract

We demonstrate for the first time high quality and dislocation free Ge-on-insulator (GOI) p-MOSFETs with Al₂O₃ gate dielectrics [EOT=1.7nm]. Compared to control Al₂O₃/Si p-MOSFETs, the Al₂O₃/GOI devices show similar leakage current for the same EOT, 2X increase in drive current, and 2.5X increase in hole mobility. In addition, the Al₂O₃/GOI devices exhibit 1.3X enhanced hole mobility over the SiO₂/Si universal hole mobility at E_{eff} of 1MV/cm.