High mobility MISFET with low trapped charge in HfSiO films

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MISFETs with HfSiO (EOT: 1.8 nm) gate insulator have been reached high Ion (95%) and low gate leakage current (1/100) against SiO2 gate film. This was achieved by the suppression of the remote coulomb scattering, caused by the electron traps in the HfSiO gate stack. It was experimentally confirmed that less than $3 \times 10^{12}$ C/cm² electron trap level is required to get high mobility.