75-word Abstract for VLSI Technology Symposium

Improved Film Growth and Flatband Voltage Control of ALD HfO_2 and Hf-Al-O with n^+ poly-Si Gates using Chemical Oxides and Optimized Post-Annealing

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Abstract:

We demonstrate for the first time that chemical oxide underlayers ~5Å thick provide improved growth and flatband voltage control of atomic layer deposition (ALD) HfO_2 films compared to thermal oxides. Optimized annealing conditions are shown to greatly reduce both fixed charge and interfacial oxide growth in the high-κ stacks. Extremely small flatband voltage shifts of < 30 mV are achieved, corresponding to a very low fixed charge of Q_f ~ 2E11 /cm^2.