Gate Voltage Dependent Model for TDDB Lifetime Prediction under Direct Tunneling Regime

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Abstract

Systematic experiments are carried out in this paper for quantitative understanding of gate voltage scaling for TDDB under direct tunneling regime. It is found that the slope of ln T_{BD} has non-linear relationship to V_{ox}. A simple model to explain the experimental voltage acceleration factor is proposed based on the Anode Hole Injection (AHI) concept. It is shown, according to our prediction, that the 1.8 nm gate oxide is still reliable in real operation voltage.