

## **Title: Simulator for Thermal Oxidation of Silicon - SOSim**

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# **SOSim - A Software Simulator for Silicon Oxidation**

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## **Abstract**

The thermal oxidation of silicon is one of the most crucial processes in Integrated Circuit Fabrication. The silicon dioxide layer acts as a diffusion barrier, a good insulator, and a gate dielectric. Over the past several years, the process-simulation tool SUPREM IV [1] has proven useful in designing and optimizing bipolar and MOS technologies. However, the age-old tool is very complicated and difficult to use. This project describes SOSim, a tool for simulating silicon's thermal oxidation in device fabrication using the Deal-Grove's [2] and Massoud's [3] model. The Deal-Grove model mathematically describes the growth of an oxide layer on a material's surface. In particular, it is used to predict and interpret thermal oxidation of silicon in semiconductor device fabrication. The model was first published in 1965 by Bruce Deal and Andrew Grove of Fairchild Semiconductor, building on Mohamed M. Atalla's work on silicon surface passivation by thermal oxidation at Bell Labs in the late 1950s. This served as a step in the development of CMOS devices and the fabrication of integrated circuits. SOSim aims to have a simplistic GUI, giving the user free control over the parameters and conditions, allowing

showing the results as quickly as possible. SOSim will also have a functionality to plot time vs. oxide thickness plots for quick reference as well.

*Keywords: Silicon Oxidation, Deal-Grove model, Massoud model, Simulator*

### **References**

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