

The Effects of Substrate Coupling on Triggering Uniformity and ESD Failure Threshold of Fully Silicided NMOS Transistors

Yoon J. Huh, Valery Axerad*, Jau-Wen Chen and Peter Bendix

Device Technology Gr., LSI Logic Corp., 1551 McCarthy Blvd. J-100 Milpitas CA 95035, (408) 954-3244

*Sequoia Design Systems, 137 Chapman Rd. Woodside, CA 94062, (650) 529 1704

We present a multi-finger turn-on model incorporating substrate coupling effects in multi-finger NMOS transistors during ESD events. It is demonstrated that the substrate coupling enables uniform triggering in a multi-finger structure. In addition, we show that fully silicided transistors can be used successfully as an ESD protection device without any design/process options if the effective epi thickness is larger than $1.5\mu\text{m}$ or bulk wafer is used.