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| **Title:** | Doping Profile Measurement and Characterization by Scanning Capacitance Microscope for Pocket Implanted Nano Scale n-MOSFET | | |
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| **Abstract:** |  |
| Abstract— This paper presents the doping profile measurement and characterization technique for the pocket implanted nano scale n-MOSFET. Scanning capacitance microscopy and atomic force microscopy have been used to image the extent of lateral dopant diffusion in MOS structures. The data are capacitance vs. voltage measurements made on a nano scale device. The technique is nondestructive when imaging uncleaved samples. Experimental data from the published literature are presented here on actual, cleaved device structures which clearly indicate the two-dimensional dopant profile in terms of a spatially varying modulated capacitance signal. First-order deconvolution indicates the technique has much promise for the quantitative characterization of lateral dopant profiles. The pocket profile is modeled assuming the linear pocket profiles at the source and drain edges. From the model, the effective doping concentration is found to use in modeling and simulation results of the various parameters of the pocket implanted nano scale n-MOSFET. The potential of the technique to characterize important device-related phenomena on a local scale is also discussed. | |