Abstracts

Geometrical and Voltage Resolution of Electrical Sampling Scanning Force Microscopy

U. Mueller, C. Boehm, J. Sprengepiel, C. Roths, E. Kubalek and A. Beyer. "Geometrical and Voltage Resolution of Electrical Sampling Scanning Force Microscopy." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 1005-1008.

The physical principle of the scanning force microscope (SFM)-mode, so-called electrical force sensing, for the evaluation of the potential distribution above integrated circuits (ICs) has already been shown. Several attempts have been made to quantify the tip-sample interaction, but up to now none of the models meets the real measurement requirements. To improve the interpretation of the measurements and to estimate the achievable geometrical and voltage resolutions an advanced model for the tip-sample interaction is introduced and treated by a rigorous field theory. The results are compared with measurements. The minimum detectable voltage is theoretically found to be 400µV while the achievable resolution for a fixed working distance of h=100nm is theoretical determined to be about Delta d=300nm.

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