Abstracts

An improved deep sub-micron MOSFET RF nonlinear model with new breakdown current model and drain to substrate nonlinear coupling

D. Heo, E. Gebara, E. Chen, S. Yoo, M. Hamai and J. Laskar. "An improved deep sub-micron MOSFET RF nonlinear model with new breakdown current model and drain to substrate nonlinear coupling." 2000 MTT-S International Microwave Symposium Digest 00.2 (2000 Vol. II [MWSYM]): 745-748.

An improved deep sub-micron (0.25 /spl mu/m) MOSFET RF large signal model that incorporates a new breakdown current model and drain to substrate nonlinear coupling was developed and investigated with various experiments. An accurate breakdown model is required for a deep submicron MOSFET due to its relatively low breakdown voltage. For the first time, this improved RF nonlinear model incorporates the breakdown voltage turnover behavior into a continuously differentiable channel current model, and the new nonlinear coupling network between the drain and lossy substrate. The robustness of the model was verified with measured pulsed I-V, S-parameters, power characteristics and inter-modulation distortions at different input and output matching conditions, operating biases, and frequencies.

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