# Abstracts

## A semianalytical parameter extraction of a SPICE BSIM3v3 for RF MOSFET's using S-parameters

In this paper, we present a new parameter-extraction method combining analytical and optimization approaches for the RF large-signal Berkeley Short-Channel IGFET Model 3, Version 3.0. Using S-parameters of MOSFET's with different channel lengths and widths at zero gate bias, all overlap capacitances are accurately determined in the high-frequency range. The junction-capacitance model parameters are extracted using S-parameters of devices with different perimeter-to-area ratios at two different biases of zero and high voltages. A robust technique utilizing simple Z-parameter equations is also used to extract resistances ($R_g$ and $R_d$) and inductances. The source and substrate resistances are initially determined using the zero-bias optimization, and their uncertainties are subsequently eliminated in the normal-bias optimization. Good agreements between measured and modeled S-parameters from 0.5 to 12 GHz demonstrate the validity of this semianalytical method.

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