Abstracts

Optimal parameter extraction and uncertainty estimation in intrinsic FET small-signal models

C. Fager, L.J.P. Linner and J.C. Pedro. "Optimal parameter extraction and uncertainty estimation in intrinsic FET small-signal models." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 2797-2803.

Analytical expressions for the relative sensitivities in the parameters of a standard intrinsic FET small-signal model with respect to deviations in the measured S-parameters are derived. This enables, in combination with a measurement uncertainty model, the model parameter uncertainties to be studied versus frequency. As a result, optimal, minimum uncertainty, parameter extraction can be performed independent of the bias voltage and without prior knowledge about the device frequency behavior, thus making it suitable for implementation in automatic multibias extraction programs. The derived sensitivities are furthermore used to analytically calculate the uncertainty in the S-parameter response of the extracted model in terms of the uncertainties in either the parameters or the measurement it was extracted from.

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