Abstracts

Computer Calculation of Large-Signal GaAs FET Amplifier Characteristics

A. Materka and T. Kacprzak. "Computer Calculation of Large-Signal GaAs FET Amplifier Characteristics." 1985 Transactions on Microwave Theory and Techniques 33.2 (Feb. 1985 [T-MTT]): 129-135.

A simple and efficient method of GaAs FET amplifier analysis is presented. The FET is represented by its circuit-type nonlinear dynamic model taking into account the device's main nonlinear effects including gate-drain voltage breakdown. An identification procedure for extraction of the model parameters is described in detail and examples are given. The calculation of the amplifier response to a single-input harmonic signal is performed using the piecewise harmonic balance technique. As this technique is rather time-consuming in its original form, the optimization routine used to solve the network equations was replaced by the Newton-Raphson algorithm. Characteristics calculated with the use of the proposed method are compared with experimental data taken for a microwave amplifier using a 2SK273 GaAs FET unit. Good agreement at 9.5 GHz over wide ranges of bias voltage and input power levels are observed.

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