Abstracts

Extrapolation of a measurement-based millimeter-wave nonlinear model of pHEMT to arbitrary-shaped transistors through electromagnetic simulations

A. Laloue, J.-B. David, R. Quere, B. Mallet-Guy, E. LaPorte, J.F. Villemazet and M. Soulard. "Extrapolation of a measurement-based millimeter-wave nonlinear model of pHEMT to arbitrary-shaped transistors through electromagnetic simulations." 1999 Transactions on Microwave Theory and Techniques 47.6 (Jun. 1999, Part II [T-MTT]): 908-914.

In this paper, a new method for nonlinear modeling of a millimeter-wave pseudomorphic high electron-mobility transistor is proposed. The method relies upon the measurements of a particular transistor sample from a given process. Deembedding of measured multibias S-parameters is performed using electromagnetic simulations of metallic parts of the transistor and leads to the determination of a distributed nonlinear model for a unit finger. This elementary model combined with electromagnetic simulations can be used to extrapolate the nonlinear model to arbitrary-shaped devices with any number of fingers. The accuracy of the method is demonstrated by predicting nonlinear models of T-shaped devices starting from a U-shaped measured transistor.

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