Abstracts

Large-signal microwave characterization of AlGaAs/GaAs HBT's based on a physics-based electrothermal model

C.M. Snowden. "Large-signal microwave characterization of AlGaAs/GaAs HBT's based on a physics-based electrothermal model." 1997 Transactions on Microwave Theory and Techniques 45.1 (Jan. 1997 [T-MTT]): 58-71.

A physics-based multicell electrothermal equivalent circuit model is described that is applied to the large-signal microwave characterization of AlGaAs/GaAs HBT's. This highly efficient model, which incorporates a new multifinger electrothermal model, has been used to perform dc, small-signal and load-pull characterization, and investigate parameter-spreads due to fabrication process variations. An enhanced Newton algorithm is presented for solving the nonlinear system of equations for the model and associated circuit simulator, which allows a faster and more robust solution than contemporary quasi-Newton nonlinear schemes. The model has been applied to the characterization of heterojunction bipolar transistor (HBT) microwave power amplifiers.

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