Abstracts

An accurate large-signal model of GaAs MESFET which accounts for charge conservation, dispersion, and self-heating

C.-J. Wei, Y.A. Tkachenko and D. Bartle. "An accurate large-signal model of GaAs MESFET which accounts for charge conservation, dispersion, and self-heating." 1998 Transactions on Microwave Theory and Techniques 46.11 (Nov. 1998, Part I [T-MTT]): 1638-1644.

A comprehensive large-signal model of a GaAs MESFET is presented to account for charge conservation and effects of dispersion and self-heating. An improved set of capacitance and charge equations, along with an enhanced Triquint Own model (TOM)-like drain current model, is used for consistent small- and large-signal simulations. Charge conservation is satisfied by deriving the capacitance part of the model from charge equations. Transconductance and output conductance dispersion is modeled by combination of a feedback network and a subcircuit, which describes the self-heating effect. An improved description of the near-pinchoff characteristics, high-voltage breakdown, and gain compression in the high-current region in the TOM is introduced. The new model accurately predicts the I-V, CV, bias-dependent S-parameter, waveform, power, and linearity characteristics of the MESFET.

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