Abstracts

An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's (Short Papers)

E. Donkor and F.C. Jain. "An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1484-1488.

A two-dimensional analytical model has been developed for the potential distribution in submicron GaAs MESFET's. The potential distribution is obtained by solving Poisson's equation with nonrectangular boundary conditions using a perturbation method. The expression for the potential is used to derive the current-voltage relation for GaAs MESFET's having channel lengths ranging from 0.2 to 0.9 µm. The model is applicable in the linear, the saturation, and the subthreshold regimes of the current-voltage characteristics. Numerically simulated results are compared with experimental data and are found to be in good agreement.

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