Abstracts

Yield Optimization Using a GaAs Process Simulator Coupled to a Physical Device Model

D.E. Stoneking, G.L. Bilbro, P.A. Gilmore, R.J. Trew and C.T. Kelley. "Yield Optimization Using a GaAs Process Simulator Coupled to a Physical Device Model." 1992 Transactions on Microwave Theory and Techniques 40.7 (Jul. 1992 [T-MTT] (Special Issue on Process-Oriented Microwave CAD and Modeling)): 1353-1363.

A physics based large-signal GaAs MESFET model and circuit simulator has been developed to predict and optimize the yield of GaAs MESFET designs before fabrication. Device acceptance criteria include both small- and large-signal RF operating characteristics such as small-signal gain, maximum added efficiency, and output power at 1 dB gain compression. Channel doping details are described directly from processing specifications for parameters such as material deposition, ion implantation, and implant annealing. Monte Carlo techniques are used to estimate yield when disturbances in the physical parameters are modeled as multivariate Gaussian distributions. The yield estimator is integrated with an optimizer so that a design can be centered for maximum yield in the presence of process disturbances.

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