Abstracts

A Novel, Bias-Dependent, Small-Signal Model of the Dual-Gate MESFET

M. Schoon. "A Novel, Bias-Dependent, Small-Signal Model of the Dual-Gate MESFET." 1994 Transactions on Microwave Theory and Techniques 42.2 (Feb. 1994 [T-MTT]): 212-216.

A dual-gate MESFET from NEC (NE25000) has been measured and modeled. S-parameters and drain-to-source currents calculated from the model are in good agreement with measured data. The model consists of a cascode of two intrinsic, single-gate, nonlinear FET-models embedded in a network representing the device parasitic. A step-by-step procedure has been used to determine the 47 parameters of the model. DC-measurements were used to find starting values for some of the parameters of the nonlinear models. The parasitic capacitances were determined from three-port S-parameters measured at V/sub DS/ = 0 V, I/sub DS/ = 0 A and V/sub G1S/ = V/sub G2S/ = -4.0V. The parasitic inductances and resistances were determined from S-parameters measured at the same bias-point but with forward-biased gates, and from DC-measurements. The final model-optimization was done by simultaneously fitting the model to drain-to-source currents and three-port S-parameters measured at several different, active bias-points (V/sub DS/ > 0).

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