Abstracts

An accurate photonic capacitance model for GaAs MESFETs

C. Navarro, J.-M. Zamanillo, A.M. Sanchez, A.T. Puente, J.L. Garcia, M. Lomer and J.M. Lopez-Higuera. "An accurate photonic capacitance model for GaAs MESFETs." 2002 Transactions on Microwave Theory and Techniques 50.4 (Apr. 2002 [T-MTT]): 1193-1197.

A new set of pseudoempirical equations is presented in order to simulate the optical and bias dependencies of GaAs MESFET junction capacitances, which is valid for the whole I-V plane. The variations induced in the small-signal equivalent circuit by the optical illumination are extracted from on-wafer scattering parameter measurements. New linear and quasi-logarithmic variations versus the incident optical power are shown for gate-drain and gate-source (Cgd and Cgs) capacitances. Furthermore, experimental results are in very good agreement with the simulated values for a wide range of optical power and bias conditions. Large signal MESFET models show a better fit with measured S-parameters than those previously published, leading to a greater degree of confidence in the design of photonic monolithic microwave integrated circuits.

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