Abstracts

A physics-based GaAs PHEMT noise model for low drain bias operation using characteristic potential method

Jooyoung Jeon, Youngwoo Kwon and Hong-Shick Min. "A physics-based GaAs PHEMT noise model for low drain bias operation using characteristic potential method." 2002 Microwave and Wireless Components Letters 12.9 (Sep. 2002 [MWCL]): 342-344.

A new physics-based noise model of a GaAs PHEMT is developed using the characteristic potential method (CPM). The model calculates the intrinsic noise current sources using CPM. Combined with the extrinsic noise parameters extracted from the measured S-parameters, the model reproduces four noise parameters of the device accurately under low drain bias voltages without using any fitting parameters. The model is verified with a 0.2-/spl mu/m GaAs PHEMT and shows excellent agreement with the measurements for all the noise parameters up to a drain voltage of 1 V Also, the proposed method allows the simulation of the microscopic noise distribution and thus allows one to obtain a physical understanding of noise mechanisms inside the device.

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