Abstracts

Simulation of Temperature Dependencies Using a New and CAD Suitable Physical GaAs-MESFET Model Including the Electron Preheating Effect

P. Nevermann and I. Wolff. "Simulation of Temperature Dependencies Using a New and CAD Suitable Physical GaAs-MESFET Model Including the Electron Preheating Effect." 1995 MTT-S International Microwave Symposium Digest 95.2 (1995 Vol. II [MWSYM]): 931-934.

A new physical model for a fast simulation of short channel MESFETS is presented. New analytical approximations for the description of the velocity-overshoot are the basis of a fast physical model named TRISTAN (Transistor modelling Including bias dependent saturation velocity, Temperature dependencies and Analysis of Noise). A description of Monte-Carlo results concerning transport and noise properties by means of new analytical formulas also enables an extreme fast access to the material properties. TRISTAN results agree well with experimental data for the noise and small signal equivalent circuit parameters in a wide temperature range down to 27 K. Furthermore it is explained how the electron preheating causes a drastically reduced overshoot effect in some real devices.

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