Abstracts

Investigation and modeling of impact ionization with regard to the RF and noise behavior of HFET

R. Reuter, M. Agethen, U. Auer, S. van Waasen, D. Peters, W. Brockerhoff and F.-J. Tegude. "Investigation and modeling of impact ionization with regard to the RF and noise behavior of HFET." 1997 Transactions on Microwave Theory and Techniques 45.6 (Jun. 1997 [T-MTT]): 977-983.

A new small-signal and noise-equivalent circuit for heterostructure field-effect transistors (HFET's), including the influence of impact-ionization and gate-leakage current on the electronic properties, is presented. The capability of the new model is demonstrated by bias-dependent investigations of the high-frequency (HF) (45 MHz up to 40 GHz) and noise behavior (2 GHz up to 18 GHz) of the InAlAs/InGaAs/InP HFET. Furthermore, based on these results, the bias-dependence of the newly implemented small-signal equivalent elements and the equivalent intrinsic noise sources, are discussed.

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