Abstracts

Improved large-signal model and model extraction procedure for InGaP/GaAs HBTs under high-current operations

S.V. Cherepko, M.S. Shirokov, J.C.M. Hwang and A. Brandstaedter. "Improved large-signal model and model extraction procedure for InGaP/GaAs HBTs under high-current operations." 2001 MTT-S International Microwave Symposium Digest 01.2 (2001 Vol. II [MWSYM]): 671-674 vol.2.

Improved large-signal as well as improved model extraction procedure is proposed for InGaP/GaAs HBTs under high-current operations. The model comprises physics-based differential equations that are implemented through symbolically defined devices in a commercially available circuit simulator. Other model improvements include bilateral logical correlation with small-signal characteristics, and additional series resistance with the base-emitter diffusion capacitance. The improvement in extraction procedure is mainly based on a fixed intrinsic vs. extrinsic base-collector capacitance ratio at low currents, whereas a fixed intrinsic base resistance at high currents. Experimentally it has been verified that the as-extracted model without numerical optimization closely predicts the RF power performance of the HBTs.

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