# Abstracts

## HBT high-frequency modeling and integrated parameter extraction

*Qian Cai, J. Gerber, U.L. Rohde and T. Daniel. "HBT high-frequency modeling and integrated parameter extraction." 1997 Transactions on Microwave Theory and Techniques 45.12 (Dec. 1997, Part II [T-MTT] (1997 Symposium Issue)): 2493-2502.*

This paper presents, for the first time, a novel nonlinear model for accurate dc, small-signal, and noise characterization of AlGaAs-GaAs heterojunction bipolar transistors (HBTs). A new set of equations are introduced to take into account the bias, temperature, and frequency dependencies in noise calculations. This model provides significant improvement in predicting small-signal noise for HBT-based circuits. We also present an integrated method for accurate HBT model parameter extraction by fitting the dc, multibias S-parameter, and noise measurements simultaneously. The extracted model provides accurate small-signal, dc current, and noise characteristics. This technique is general and can be used for parameter extraction of other microwave devices such as MESFETs and high electron mobility transistors (HEMTs). Our new HBT model is validated using devices from different foundries. An integrated parameter extraction technique is demonstrated for a foundry HBT and excellent results are obtained.

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