Abstracts

Evaluation of the Factors Determining HBT High-Frequency Performance by Direct Analysis of S-Parameter Data

D.R. Pehlke and D. Pavlidis. "Evaluation of the Factors Determining HBT High-Frequency Performance by Direct Analysis of S-Parameter Data." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2367-2373.

A novel parameter extraction formalism for the evaluation of Heterojunction Bipolar Transistor (HBT) device physics is presented. The technique employs analytically derived expressions for direct calculation of the HBT T-Model equivalent circuit element values in terms of the measured S-parameters. All elements are directly calculated with the exception of the emitter leg of the T-model. This approach avoids errors due to uncertainty in fitting to large, overdetermined equivalent circuits and does not require the use of test structures and extra measurement steps to evaluate parasitic. Detailed bias dependent results for the directly calculated circuit elements are presented. An analysis is also reported of the short circuit current gain that separates the transit times and RC products and allows evaluation of their individual contribution to the measured f/sub T/ and significance in limiting the HBTs high frequency performance.

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