Abstracts

Analytical Parameter Extraction of the HBT Equivalent Circuit with T-Like Topology from Measured S-Parameters

U. Schaper and B. Holzapfl. "Analytical Parameter Extraction of the HBT Equivalent Circuit with T-Like Topology from Measured S-Parameters." 1995 Transactions on Microwave Theory and Techniques 43.3 (Mar. 1995 [T-MTT]): 493-498.

A pure analytical method for extraction of the small-signal equivalent circuit parameters from measured data is presented and successfully applied to heterojunction bipolar transistors (HBT's). The T-like equivalent circuit is cut into three shells accounting for the connection, and the extrinsic and intrinsic parts of the transistor. The equivalent circuit elements are evaluated in a straightforward manner from impedance and admittance representation of the measured S-parameters. The measured data are stripped during the extraction process yielding, step by step, a full set of circuit elements without using fit methods. No additional knowledge of the transistor is needed to start the extraction process with its self-consistent iteration loop for the connection shell. The extrinsic and intrinsic equivalent circuit elements are evaluated using their bias and frequency dependencies. This method yields a deviation of less then 4% between measured and modeled S-parameters.

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