Abstracts

DC to high-frequency HBT-model parameter evaluation using impedance block conditioned optimization

A. Samelis and D. Pavlidis. "DC to high-frequency HBT-model parameter evaluation using impedance block conditioned optimization." 1997 Transactions on Microwave Theory and Techniques 45.6 (Jun. 1997 [T-MTT]): 886-897.

A new heterojunction bipolar transistor (HBT) small-signal equivalent-circuit parameter-extraction procedure employing multibias S-parameter data is presented. The algorithm combines analytical and empirical parameter evaluation techniques and results in a bias-dependent HBT model. To minimize the risk of nonphysical parameter estimation, elements such as the DC transport factor, /spl alpha//sub o/, and the emitter-base conductance are evaluated from the device DC characteristics, and the frequency dispersion of /spl alpha/ is related to the RC time-constant of the emitter-base junction. Moreover, initial values for the extrinsic device parasitics are obtained from "hot" as well as "cold" S-parameter data. The method results in excellent fit between measured and modeled S-parameter data in the frequency range DC-40 GHz and for a wide range of bias operating points.

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