Abstracts

A new large-signal InP/InGaAs single HBT model including self-heating and impact ionization effects

Taeho Kim and Kyounghoon Yang. "A new large-signal InP/InGaAs single HBT model including self-heating and impact ionization effects." 2002 MTT-S International Microwave Symposium Digest 02.3 (2002 Vol. III [MWSYM]): 2141-2144 vol.3.

A new large-signal model of InP/InGaAs single heterojunction bipolar transistors (SHBTs) has been developed which includes self-heating and impact ionization effects. The model is based on the conventional Gummel-Poon large-signal BJT model. The self-heating and impact ionization effects observed from InP-based SRBTs were modeled through a macro modeling approach. In order to take into account the dependence of impact ionization on the applied voltage and thermal effect, a feedback current source and a temperature dependent voltage source were used in the model as a function of junction temperature, I/sub C/ and V/sub CB/. The model implemented in HP-ADS is verified by comparing the simulated and measured data in DC, multi-bias small-signal S-parameters and large-signal microwave power characteristics.

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