Abstracts

Large-signal modeling and characterization of high-current effects in InGaP/GaAs HBTs

M.S. Shirokov, S.V. Cherepko, Xiaohang Du, J.C.M. Kwang and D.A. Teeter. "Large-signal modeling and characterization of high-current effects in InGaP/GaAs HBTs." 2002 Transactions on Microwave Theory and Techniques 50.4 (Apr. 2002 [T-MTT]): 1084-1094.

High-current effects in InGaP/GaAs heterojunction bipolar transistors (HBTs) were modeled and characterized. In addition to the self-heating effect, high currents were found to degrade large-signal performance mainly through Kirk and quasi-saturation effects. New formalisms in terms of base transit time and base-collector diffusion capacitance were used to modify the conventional Gummel-Poon model. This new model was verified against large-signal characteristics measured at 2 GHz. The validity of the new model for HBTs of different emitter geometry was also explored.

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