Abstracts

Measurement and modelling of static and dynamic breakdowns of power GaInP/GaAs HBTs

S. Heckmann, J.-M. Nebus, R. Quere, J.-C. Jacquet, D. Floriot and P. Auxemery. "Measurement and modelling of static and dynamic breakdowns of power GaInP/GaAs HBTs." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 1001-1004 vol.2.

The breakdown values of GaInP/GaAs HBTs have been strongly increased, keeping constant RF performance. A 67 V common base breakdown voltage (BVcb0) is obtained associated with a 37 V collector emitter breakdown value (BVce0). Such devices have great potential for use in base stations as power amplifiers where 10 W (linear) and 100 W (compressed) output powers are needed. For such powers, transistors work close to the breakdown limit. Therefore, accurate modelling of both static and dynamic breakdown phenomena becomes important for the optimum design of reliable amplifiers. This is the purpose of this paper. The base-collector breakdown of a 16-finger HBT transistor has been characterised in the cases of constant base current and constant base voltage biasing conditions. An HBT model accounting for breakdown is presented and large signal load pull measurements reported.

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