Abstracts

Cryogenic Small-Signal Model for 0.55-µm Gate-Length Ion-Implanted GaAs MESFET's

J. Laskar, J. Kruse and M. Feng. "Cryogenic Small-Signal Model for 0.55-µm Gate-Length Ion-Implanted GaAs MESFET's." 1992 Microwave and Guided Wave Letters 2.6 (Jun. 1992 [MGWL]): 242-244.

The cryogenic microwave performance of 0.5 x 300µm gate ion-implanted GaAs MESFET's are presented. The devices studied here have been fabricated as part of a process control monitor chip (PCM) which uses comparable industry standard design rules. We have performed detailed small-signal element modeling to determine the temperature dependence of important physical parameters over a lattice temperature range from 300 K to 115 K. We find appreciable improvement in cut-off frequency and well behaved temperature dependence of transconductance (g/sub m/) and gate-source capacitance (C/sub gs/). Empirical relations for the temperature dependence of f/sub T/, f/sub max/, g/sub m/, and C/sub gs/ that should provide accurate temperature dependant device and circuit models, are presented.

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