Abstracts

RF performance and thermal analysis of AlGaN/GaN power HEMTs in presence of self-heating effects

S. Nuttinck, E. Gebara, J. Laskar, B. Wagner and M. Harris. "RF performance and thermal analysis of AlGaN/GaN power HEMTs in presence of self-heating effects." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 921-924 vol.2.

Power, linearity and noise performance of AlGaN/GaN power HEMTs are measured at different gate-to-source bias conditions in order to study the influence of self-heating on RF performance. Additionally, a load-pull system, capable of measuring intermodulation distortion products under pulsed mode of operation, is implemented for the first time. This new system is used to investigate the impact of self-heating on power device linearity. Also, for the first time, the effect of the RF drive on thermal effects and power added efficiency (PAE) is investigated. This forms the basis of more accurate nonlinear models. Finally, thermal simulations of 2-finger GaN FETs are performed under pulsed and continuous regimes to determine the temperature distribution caused by a 5W/mm power dissipation density.

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