Abstracts

Measurement and characterization of HEMT dynamics

A.E. Parker and J.G. Rathmell. "Measurement and characterization of HEMT dynamics." 2001 Transactions on Microwave Theory and Techniques 49.11 (Nov. 2001 [T-MTT] (Special Issue on the 2000 Asia-Pacific Microwave Conference)): 2105-2111.

The variation of high electron-mobility transistor (HEMT) large-signal behavior with a change in operating condition is examined with a view to understanding the dynamics involved and developing a modeling strategy. The observed variation exhibits the dynamics of thermal, impact ionization, and trapping effects. A novel measurement of drain characteristic transients gives time-evolution information that clearly shows these as separate quantifiable phenomena with significant dependence on initial operating conditions. A drain-current model that describes high-frequency characteristics with pinchoff, gain, and drain feedback parameters is adapted to describe the variation of the characteristics with changing operating conditions. The results reported give insight and grounding for simulation of HEMT circuits.

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