Abstracts

Temperature-Dependent Modeling of Gallium Arsenide MESFET's

S.M. Lardizabal, A.S. Fernandez and L.P. Dunleavy. "Temperature-Dependent Modeling of Gallium Arsenide MESFET's." 1996 Transactions on Microwave Theory and Techniques 44.3 (Mar. 1996 [T-MTT]): 357-363.

A complete temperature-dependent small signal model extraction methodology is used to achieve accurate circuit level simulations of metal semiconductor field-effect transistor (MESFET) amplifier performance over temperature. The procedure applies a previously described field-effect transistor (FET) modeling approach to predict the performance of a small signal amplifier over a -55° C to 100° C temperature range. This work includes a description of the MESFET equivalent circuit element thermal coefficients along with an amplifier simulation. Therefore, for the first time, a clear correspondence between circuit level simulation and measured results over temperature are published together. A new comparison of published temperature-dependent data shows a common agreement for amplifier gain variations of 0.015 dB/°C/Stage for a broad range of designs from 400 K down to cryogenic levels (77 K).

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