Abstracts

Nonlinear Analysis of GaAs MESFET Amplifiers, Mixers, and Distributed Amplifiers Using the Harmonic Balance Technique

W.R. Curtice. "Nonlinear Analysis of GaAs MESFET Amplifiers, Mixers, and Distributed Amplifiers Using the Harmonic Balance Technique." 1987 Transactions on Microwave Theory and Techniques 35.4 (Apr. 1987 [T-MTT]): 441-447.

The harmonic balance technique with Newton's method is used to analyze several forms of large-signal operation of GaAs MESFET's, including, for the first time, a multiple-device configuration. Computer programs for the study of the MESFET mixer, intermodulation distortion in MESFET amplifiers, and the large-signal analysis of the MESFET distributed amplifier are described and examples of analyses are given. Convergence properties are excellent, even for cases with a large number of error functions. The choice of time period for analysis, the number of sampling points required, and factors critical to convergence are discussed. Time sampling at much larger than the Nyquist rate does not significantly improve the accuracy and greatly increases the program's execution time.

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