Abstracts

Prediction of Wide-Band Power Performance of MESFET Distributed Amplifiers Using the Volterra Series Representation

C.L. Law and C.S. Aitchison. "Prediction of Wide-Band Power Performance of MESFET Distributed Amplifiers Using the Volterra Series Representation." 1986 Transactions on Microwave Theory and Techniques 34.12 (Dec. 1986 [T-MTT] (1986 Symposium Issue)): 1308-1317.

The power performance of a four-section MESFET distributed amplifier is predicted over the frequency range 2-8 GHz. The nonlinear model of the MESFET used has three nonlinear elements: g/sub m/, g/sub d/, and C/sub gs/, which are represented by power series up to the third order. The analysis employs the Volterra series representation up to the third order. Experimental verification is first made on a 0.5x400-µm medium-power MESFET device to confirm the validity of the nonlinear model used in the analysis. The agreement between predicted and measured output power at 1-dB gain compression is within ±0.5 dBm across the 2-16 GHz band. A four-section distributed amplifier was then built with four 0.5x400-µm MESFET's. The agreement between predicted and measured output power at 1-dB gain compression of this amplifier is within ±0.7 dBm across the 2-8-GHz band. The measured output power at 1-dB gain compression is (22±1) dBm across the 2-8-GHz band.

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