Abstracts

Analysis of GaAs MESFET Spectrum Regeneration Driven by a Pi/4-DQPSK Modulated Source

J.F. Sevic and M.B. Steer. "Analysis of GaAs MESFET Spectrum Regeneration Driven by a Pi/4-DQPSK Modulated Source." 1995 MTT-S International Microwave Symposium Digest 95.3 (1995 Vol. III [MWSYM]): 1375-1378.

A new method of analyzing transistor nonlinearity in the context of digital modulation is proposed. Classical methods of nonlinearity analysis, such as the third-order intercept point, are ill-suited for systems based on digitally modulated signals. The third-order intercept point ignores higher-order effects and latent out-of-channel power, both of which affect spectrum regeneration. Using a power spectral density description of the source, coupled with a simplified Volterra series model of a GaAs MESFET, it is shown that reactive nonlinearity significantly contributes to spectrum regeneration. Subsequently, insight is gained at the device level for doping/implant improvements and at the terminal level for optimal loading, resulting in improved linearity.

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