Abstracts

FET noise-parameter determination using a novel technique based on 50-/spl Omega/ noise-figure measurements

A. Lazaro, L. Pradell and J.M. O'Callaghan. "FET noise-parameter determination using a novel technique based on 50-/spl Omega/ noise-figure measurements." 1999 Transactions on Microwave Theory and Techniques 47.3 (Mar. 1999 [T-MTT]): 315-324.

A novel method for measuring the four noise parameters of a field-effect transistor (FET) is presented. It is based on the determination of its intrinsic noise matrix elements [C/sub 11//sup INT/, C/sub 22//sup INT/, Re(C/sub 12//sup INT/), Im(C/sub 12//sup INT/)] by fitting the measured device noise figure for a matched source reflection coefficient (F/sub 50/) at a number of frequency points, thus, a tuner is not required. In contrast to previous works, no restrictive assumptions are made on the intrinsic noise sources. The receiver full-noise calibration is easily performed by using a set of coaxial and on-wafer standards that are commonly available in a microwave laboratory, thus, an expensive broad-band tuner is not required for calibration either. On-wafer experimental verification up to 26 GHz is presented and a comparison with other F/sub 50/-based and tuner-based methods is given. As an application, the dependence of the FET intrinsic noise sources as a function of the bias drain-current and gate-length is obtained.

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