Abstracts

Noise characterization of multiport amplifiers

J. Randa. "Noise characterization of multiport amplifiers." 2001 Transactions on Microwave Theory and Techniques 49.10 (Oct. 2001, Part I [T-MTT] (Mini-Special Issue on Electrical Performance of Electronic Packaging (EPEP))): 1757-1763.

This paper addresses the issue of the definition and measurement of the noise figure and parameters to characterize multiport devices, particularly differential amplifiers. A parametrization in terms of the noise matrix appears to be the most practical. The noise figure for a given output port is defined and related to the noise matrix and scattering parameters of the device, as well as the correlations between different input noise waves. The degradation of the signal-to-noise ratio is obtained from a special choice of the input correlation function. Two examples are considered in detail: a three-port differential amplifier and a four-port mixed-mode amplifier, both with reflectionless terminations. The noise figures, effective input temperatures, and gains are related to the results of a series of hot-cold measurements, as in the familiar two-port case.

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