Abstracts

The Effect of Mismatched Components on Microwave Noise-Temperature Calibrations

T.Y. Otoshi. "The Effect of Mismatched Components on Microwave Noise-Temperature Calibrations." 1968 Transactions on Microwave Theory and Techniques 16.9 (Sep. 1968 [T-MTT] (Special Issue on Noise)): 675-686.

A technique is presented for analyzing the effect of mismatched components on the absolute noise-temperature calibrations of principal noise sources in a microwave receiving system. Scattering parameters are used to describe the properties of the microwave network that is connected between noise source and receiver. The calibration method discussed is the Y-factor power-ratio measurement technique involving the use of two thermal noise reference standards. Calculations made for an operational low-noise antenna receiving system indicate that, even when components have reasonably low-voltage reflection coefficients (typically less than 0.05), peak errors due to mismatches could be as high as 70 percent and 11 percent on measured antenna and effective input noise-temperature values, respectively. For the special case where the reflected and direct wave receiver noise sources are fully correlated, the peak errors can be even larger.

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