Abstracts

Applications and Analysis of Noise Generation in N-Cascaded Mismatched Two-Port Networks

T. Mukaihata. "Applications and Analysis of Noise Generation in N-Cascaded Mismatched Two-Port Networks." 1968 Transactions on Microwave Theory and Techniques 16.9 (Sep. 1968 [T-MTT] (Special Issue on Noise)): 699-708.

Generalized equations are derived for noise generation and its propagation in linear N-cascaded two-port networks with mismatches. The analytical method is applied to microwave measurements in low-noise technology; e.g., in determining the effective input noise temperatures of a cryogenic paramp and the noise temperature of a cryogenic noise standard in a mismatched system. This approach is also applicable to mismatched networks at different temperatures. Two types of thermal noise standards utilizing liquid helium or helium gas as a refrigerant are described. Either type can be mounted on the back side of antennas and switched into the microwave-receiver line. However, the noise standard with the helium-gas refrigerator has the advantage of operating without refilling or spilling its coolant as the antenna elevation is varied.

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