Abstracts

Analysis of a Negative Conductance Amplifier Operated with a Nonideal Circulator

E.W. Sard. "Analysis of a Negative Conductance Amplifier Operated with a Nonideal Circulator." 1959 Transactions on Microwave Theory and Techniques 7.2 (Apr. 1959 [T-MTT]): 288-293.

Negative conductance amplifiers are usually operated with a circulator in order to achieve greater gain-bandwidth products and stable operation. Typical circulators differ from ideal circulators in that the forward loss between ports is not zero, and the reverse isolation between ports is not intinite. The main effects of nonintinite isolation are shown to be a modified gain-bandwidth product and a assumed to exist between ports 3 and 2. No other dechange in output admittance of the circulator output port. These effects result principally from the finite isolation between the output and amplifier ports. The main effect of incidental dissipation has previously been shown to be an increase in system noise figure. This paper considers only the effects caused by noninfinite isolation. A model of a lossless three-port circulator with noninfinite isolation is set up, and a negative conductance amplifier is considered to be limited to ensure a positive output conductance at the output port of the circulator (that is, the combination of negative conductance amplifier and nonideal circulator is assumed to be open-circuit stable). Subject to this assumption, the combination of negative conductance amplifier and nonideal circulator is then analyzed for its output admittance, available power gain, and effective input noise temperature.

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