Abstracts

A Design Theory for Optimum Broadband Reflection Amplifiers

The design procedure for optimum broadband negative-resistance amplifiers is given, by reference to the work of Fano, on the broadband matching of arbitrary impedances. Complete sets of curves are given which indicate the limits on the gain-bandwidth performance which can be achieved for a particular negative-resistance device, while also showing the ripple in gain and the resulting phase response obtained. The optimum amplifiers are also compared with others of the same class, and it is found that considerable advantage in terms of ripple and phase response can be gained by using nonoptimum designs in certain cases. The paper also includes explicit formula for the element values of the matching network applicable to both optimum and nonoptimum designs. A design example is given for a tunnel-diode amplifier.

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