Abstracts

The Effect of Parasitic Elements on Reflection Type Tunnel Diode Amplifier Performance

J.O. Scanlan and J.T. Lim. "The Effect of Parasitic Elements on Reflection Type Tunnel Diode Amplifier Performance." 1965 Transactions on Microwave Theory and Techniques 13.6 (Nov. 1965 [T-MTT]): 827-836.

The effect of the tunnel diode series inductance and stray capacitance on the gain and bandwidth of broadband reflection type amplifiers is considered. General stability criteria imposed by these reactance are given together with realizability conditions for ideal (flat gain), Butterworth and Chebyshev responses. The main effect of the parasitic elements is to restrict the range of gain and bandwidth which may be achieved for a given number of elements in the matching network. The minimum gain is restricted together with both the maximum and minimum bandwidths. Comprehensive sets of curves are given which enable a rapid design of either Butterworth or Chebyshev response to be accomplished, and a procedure is given for conversion of the low-pass prototype network to band-pass form in the presence of the parasitic reactances. The frequency transformation is used to obtain an upper limit on the center frequency of the band-pass amplifier imposed by the parasitic. The use of the design data is illustrated by numerical examples.

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