Abstracts

Some Limitations on Parametric Amplifier Noise Performance

R.D. Weglein. "Some Limitations on Parametric Amplifier Noise Performance." 1960 Transactions on Microwave Theory and Techniques 8.5 (Sep. 1960 [T-MTT]): 538-544.

Now that the precursory period following the solid-state parametric amplifier invention has given way to an era of determined effort to reduce to practice some of the early, optimistic predictions, practical limitations setting an upper bound to the performance of this ingenious communications device have become apparent. In this paper, two such limitations are discussed: First, for a given diode Q and junction geometry, there exists a noninfinite idler frequency, which determines the lowest radar noise temperature. Second, because of its extreme noisiness the reverse-break-down current limits the maximum capacitance swing at both extremes and consequently the minimum noise performance. It is suggested that in certain cases refrigeration may be a partial remedy to both limitations.

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