Abstracts

Conversion Loss in GaAs Schottky-Barrier Mixer Diodes

T.W. Crowe and R.J. Mattauch. "Conversion Loss in GaAs Schottky-Barrier Mixer Diodes." 1986 Transactions on Microwave Theory and Techniques 34.7 (Jul. 1986 [T-MTT]): 753-760.

In this paper, the intrinsic conversion loss of GaAs Schottky-barrier mixer diodes is analyzed in light of a more accurate diode model. This analysis resolves the discrepancy between the predictions of an earlier intrinsic conversion loss model and expefimental results. In particular, it is shown that a) cryogenic cooling should not degrade the conversion loss, and b) the diode diameter can be smaller than previously predicted before conversion-loss degradation begins to occur. Evidence is also presented which indicates that mixer diodes must be pumped beyond flat-band if the minimum, possible conversion loss is to be obtained. A more complete model of the conversion loss, which includes the parasitic circuit elements, is discussed and found to be in agreement with the qualitative results of the intrinsic conversion-loss model.

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