Abstracts

Measurement of the Conversion Conductance of Esaki Mixer Diodes (Correspondence)

R.A. Pucel. "Measurement of the Conversion Conductance of Esaki Mixer Diodes (Correspondence)." 1961 Transactions on Microwave Theory and Techniques 9.6 (Nov. 1961 [T-MTT]): 567-568.

In order to compare the theoretically predicted and the experimentally observed behavior of frequency converters using Esaki diodes, it is necessary to evaluate various mixer parameters, in particular, the conductance elements of the conversion matrix. It is well known, these conductance elements are certain Fourier coefficients of the periodic series representing the incremental time-varying diode conductance. This conductance is produced by the large local oscillator (LO) voltage acting on the non-linear diode. Although one can determine these element values using a numerical Fourier analysis, this approach is both time-consuming and laborious. As an alternative, we suggest an experimental technique originally proposed by Dicke over ten years ago for use with conventional (positive-conductance) crystal mixer diodes. Since this method is quite easy to apply in that it only involves several low-frequency bridge measurements and one standing-wave measurement, and since, apparently, it is not well known, we shall risk repetition by describing a simplified version of it which we have modified to apply to Esaki diodes.

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