Abstracts

A Microwave Measurement Technique for Characterizing the I-V Relationship for Negative Differential Conductance Devices (Short Papers)

P. Huang, D.S. Pan and N.C. Luhmann, Jr.. "A Microwave Measurement Technique for Characterizing the I-V Relationship for Negative Differential Conductance Devices (Short Papers)." 1993 Transactions on Microwave Theory and Techniques 41.7 (Aug. 1993 [T-MTT]): 1455-1458.

The practical procedures of a recently proposed technique to experimentally determine the I-V characteristics of negative differential conductance (NDC) devices are presented in this paper. The technique employs microwave reflection coefficients together with the measurable portions of the device's I-V characteristics to infer the I-V curve in the negative conductance region where oscillations tend to occur under normal dc bias conditions. The effects of higher harmonics at large signal levels are also taken into account in the calculation. The advantages of the method for high NDC devices have been pointed out in the stability analysis contained in a previously published letter. The technique was demonstrated in the case of a low NDC tunnel diode where the agreement between the deduced I-V curve using the described method and the dc measured I-V curve is within 5%. The I-V curve in the negative conductance region for another tunnel diode with much higher negative conductance is also obtained and a self-consistent accuracy of 5% is found.

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