Abstracts

A Novel Planar Diode Mixer for Submillimeter-Wave Applications

T. Newman, W.L. Bishop, K.T. Ng and S. Weinreb. "A Novel Planar Diode Mixer for Submillimeter-Wave Applications." 1991 Transactions on Microwave Theory and Techniques 39.12 (Dec. 1991 [T-MTT] (1991 Symposium Issue)): 1964-1971.

A novel mixer employing a planar GaAs Schottky diode has been designed and tested over a 300-365 GHz band-width at the University of Virginia (UVa). Using a planar diode eliminates the disadvantages of mechanical instability and labor intensive assembly associated with conventional whisker-contacted diodes. The mixer design process used scale model impedance measurements both for the design of individual components and for the measurement of impedances presented to the diode terminals by the mixer mount at fundamental and harmonic frequencies. Results from these impedance measurements were then used in linear and nonlinear numerical mixer analyses to predict the mixer performance. To the best of our knowledge, this represents the first attempt at using a planar diode in a submillimeter-wave mixer, and test results indicate performance comparable with the best whisker-contacted room temperature mixers for submillimeter wavelengths.

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