Abstracts

35 GHz InGaAs HEMT MMIC Downconverter

J. Yonaki, R. Carandang, B.A. AIlen, M. Hoppe, W.L. Jones, D.C. Yang and C.L. Brunnenmeyer. "35 GHz InGaAs HEMT MMIC Downconverter." 1991 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 91.1 (1991 [MCS]): 47-50.

The design and development of a 35 GHz HEMT MMIC downconverter is reported. This completely monolithic chip consists of a balanced two-stage low noise amplifier cascaded with a singly balanced (HEMT compatible) diode mixer. Conversion gain of 5 dB over a 20 to 100 MHz IF output with an RF frequency of 35 GHz and an LO frequency = RF + IF has been measured. In addition to the downconverter macrocell, the LNA and mixer designs were fabricated as individual microcells. The LNA has demonstrated state-of -the-art performance: measured noise figure (NF) from 34 to 40 GHz is less than 2.8 dB. Associated gain is 14.0 +/- 0.4 dB over a 30 to 40 GHz bandwidth. Input and output VSWR is better than 1.2:1. The singly balanced mixer exhibited conversion loss of less than 5 dB. The design and test results of these circuits are presented.

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