Abstracts

Progress towards the realization of MMIC technology at submillimeter wavelengths: a frequency multiplier to 320 GHz

J. Bruston, R.P. Smith, S.C. Martin, D. Humphrey, A. Pease and P.H. Siegel. "Progress towards the realization of MMIC technology at submillimeter wavelengths: a frequency multiplier to 320 GHz." 1998 MTT-S International Microwave Symposium Digest 98.2 (1998 Vol. II [MWSYM]): 399-402.

The authors report on the design, analysis and performance of an all GaAs MMIC multiplier for use at submillimeter wavelengths. A novel method for coupling power in and out of the MMIC chip via a broadband photoetched ridge-waveguide-to-microstrip transition has been developed and used for this implementation. Measurements on the first iteration chipset, which implements a Schottky varactor diode doubler to 320 GHz, show a conversion efficiency of 2.8% at an input power level of 15 mW. This performance is shown to be extremely well predicted by commercially available circuit simulators: HP MDS and Ansoft Maxwell. A second iteration chipset, based upon the excellent agreement between the numeric simulator and measurements on the existing circuit, is nearly complete and is expected to yield even better performance.

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