Abstracts

Cryogenic Millimeter-Wave Receiver Using Molecular Beam Epitaxy Diodes (Dec. 1978 [T-MTT])

R.A. Linke, M.V. Schneider and A.Y. Cho. "Cryogenic Millimeter-Wave Receiver Using Molecular Beam Epitaxy Diodes (Dec. 1978 [T-MTT])." 1978 Transactions on Microwave Theory and Techniques 26.12 (Dec. 1978 [T-MTT] (1978 Symposium Issue)): 935-938.

A millimeter-wave cryogenic receiver has been built for the 60-90-GHz frequency band using GaAs mixer diodes prepared by molecular beam epitaxy (MBE). The diodes are mounted in a reduced-height image rejecting waveguide mixer which is followed by a cooled parametric amplifier at 4.5-5.0 GHz. At a temperature of 18 K the receiver has a total single-sideband (SSB) system temperature of 312 K at a frequency of 81 GHz. This is the lowest system temperature ever reported for a resistive mixer receiver. The low-noise operation of the mixer is seen to be a result of 1) the short-circuiting of the noise entering the image port and 2) an MBE mixer diode with a noise temperature which is consistent with the theoretical shot noise from the junction and the thermal noise from the series resistance.

❑ Return to main document.