Abstracts

Low-Noise Room-Temperature and Cryogenic Mixers for 80-120 GHz

A.R. Kerr. "Low-Noise Room-Temperature and Cryogenic Mixers for 80-120 GHz." 1975 Transactions on Microwave Theory and Techniques 23.10 (Oct. 1975 [T-MTT]): 781-787.

A description is given of two new mixers designed to operate in the 80-120-GHz range on the 36-ft radio telescope at Kitt Peak, Ariz. It is shown that for a hard-driven diode the parasitic resistance and capacitance are the primary factors influencing the design of the diode mount. A room-temperature mixer is described which achieves a single-sideband (SSB) conversion loss (L) of 5.5 dB, and a SSB noise temperature (T/sub m/) of 500 K (excluding the IF contribution) with a 1.4-GHz IF. A cryogenically cooled version, using a quartz structure to support the diode chip and contact whisker, achieves values of L = 5.8 dB and T/sub m/ = 300 K with a 4.75-GHz IF. The mixers use high-quality Schottky-barrier diodes in a one-quarter-height waveguide mount.

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