Abstracts

Super-Schottky Mixer Performance at 92 GHz

R.L. Dickman, W.J. Wilson and G.G. Berry. "Super-Schottky Mixer Performance at 92 GHz." 1981 Transactions on Microwave Theory and Techniques 29.8 (Aug. 1981 [T-MTT]): 788-793.

As part of a program to explore the behavior of superconducting Schottky mixers at high frequencies (nu/sub RF/ >= 90 GHz), the mixing and video performance of several super-Schottky diodes have been tested at 92 GHz. The diodes used (~3-µm active diameter, doping concentration ~2x 10/sup 19/ cm/sup -3/) were identical to those recently developed at Aerospace for use in a 31-GHz mixer. The WR-10 mixer mount, designed specifically for this experiment, utilizes a quartz stripline assembly for the diode, whisker, and IF choke, suspended across quarter-height RF wavegnide. At 92 GHz, video responsivities were typically ~80 A/W (corrected for RF mismatch). Conversion loss (corrected for both RF and IF mismatches) was typically measured to he /spl gsim/18 dB. As expected, T/sub diode/ was small (< 5K). Video responsivity and conversion loss were also measured at an RF frequency of 3.95 GHz. These data were used with the measured I- V characteristics of the diodes to compare theoretical predictions of diode performance at 92 GHz in both the video and mixing modes, with the high-frequency data.

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