

Abstracts

Superconducting Tunnel Junctions as Mixers at 115 GHz

G.J. Dolan, R.A. Linke, T.C.L.G. Sollner, D.P. Woody and T.G. Phillips. "Superconducting Tunnel Junctions as Mixers at 115 GHz." 1981 Transactions on Microwave Theory and Techniques 29.2 (Feb. 1981 [T-MTT]): 87-91.

Superconducting tunnel junctions have been used as the nonlinear element for mixing at a signal frequency of 115 GHz. The experimental results are compared with predictions of a theoretical analysis based on the quantum theory of mixing of J. R. Tucker. Qualitative agreement is obtained and suggestions are made for quantitative reconciliation. The junctions were small area ($\approx 0.4 \mu\text{m}^2$) with normal resistances of 60 to 100 Ω and capacitance approximately 20 fF. Measured sensitivity ($T/\text{sup SSB}/\text{sub MXR}/=62 \text{ K}$, $L/\text{sub c}/=7.6 \text{ dB}$) implies receiver noise temperatures superior to the best receivers now in use at this frequency.

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