Abstracts

Low-Noise Properties of Microwave Backward Diodes

S.T. Eng. "Low-Noise Properties of Microwave Backward Diodes." 1961 Transactions on Microwave Theory and Techniques 9.5 (Sep. 1961 [T-MTT]): 419-425.

This paper describes, for what is believed to be the first time, the low-noise properties of backward tunnel diodes in microwave applications. The physics of the diodes are reviewed together with some of the characteristics and equivalent circuit parameters. The diodes are then considered as mixer diodes with IF in the audio range and also the standard 30-Mc IF. Another promising application considered is the use of the backward diodes in low-level detection. The results show that the noise figure at 13.5 kMc with a 1-kc IF is around 15 db better than any commercially available mixer diodes. Using 30-Mc IF, the noise figure of backward diode mixers is without special optimum design, comparable to the best mixer diodes on the market. Of great importance, especially in micro-miniaturization, is the fact that these diodes may be used with a very low local oscillator power (50 µw or less). The high nonlinearity of the I-V characteristic at the origin and the low 1/f noise properties of these diodes are also of benefit in crystal video receivers and other low-level detector applications.

❑ Return to main document.