Abstracts

Microstrip High-Power L-Band Avalanche-Diode Oscillator

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A simple microstrip oscillator circuit has been designed for use with the high-power high-efficiency avalanche diodes recently reported. Power outputs of the order of 100 W at L-band with efficiencies between 20 and 30% compare reasonably with that from the coaxial line circuit. This result demonstrates the capability of integration of such high-efficiency diodes for system applications. The diode chips used for the microstrip circuit are punch-through PNN/sup +/ silicon mesa diodes with junctions formed by diffusion of boron into N-type silicon epitaxial wafers. The resistivity of the epitaxial layer is 5 to 7 ohm-cms, and the width of the N-region is about 6 µm. Mesa diameters range from 0.018 in. to 0.023 in., and the breakdown voltages of the diodes are between 120 and 160 volts.

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