Abstracts

A Multiple-Diode High-Average-Power Avalanche-Diode Oscillator (Correspondence)

C.T. Rucker. "A Multiple-Diode High-Average-Power Avalanche-Diode Oscillator (Correspondence)." 1969 Transactions on Microwave Theory and Techniques 17.12 (Dec. 1969 [T-MTT]): 1156-1158.

This correspondence presents a simple circuit which allows direct combining of the power obtainable from several avalanche diodes. The circuit does not require extremely close matching of dc or RF diode characteristics, and no particular isolating networks such as hybrid combiners are necessary. CW power output exceeding 4 watts at 7 GHz and 3 watts at 9 GHz has been demonstrated in a device employing five diodes. The number of diodes which can be combined using this technique is limited by geometric and heat sink considerations. Descriptions of typical single-diode and multiple-diode oscillators are given along with equivalent circuits. The circuits employ resistors or resistor networks to suppress low-frequency oscillations and undesired resonances which occur when several oscillators are coupled together. Negligible insertion loss is incurred at the design output frequency. Measured performance is given on similar single- and multiple-diode oscillators. Data include frequency, power, AM noise, FM noise, temperature, and loaded Q.

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