Abstracts

High-Power Pulsed UHF and L Band p+-n-n+ Silicon TRAPATT Diode Lasers

C.O.G. Obah, E. Benko, H.C. Bowers, T.A. Midford and R.D. Regier. "High-Power Pulsed UHF and L Band p+-n-n+ Silicon TRAPATT Diode Lasers." 1975 Transactions on Microwave Theory and Techniques 23.12 (Dec. 1975 [T-MTT] (1975 Symposium Issue)): 959-970.

The design and performance of both the lumped-element TRAPATT oscillator circuit and deep-diffused p+-n-n+ silicon TRAPATT diodes designed primarily for pulsed radar applications in the UHF and L band frequency ranges are discussed. Circuit conditions for optimum performance are described. Methods of optimizing diodes are presented. Diode performance capability is shown to depend on the relative position of the junction in the device depletion region. Peak powers close to 900 W and maximum conversion efficiencies of 40 percent have been achieved from diodes with large p-region width to total depletion region width ratios. RF leading-edge jitter of less than 1 ns has been obtained under optimum circuit and diode operating conditions.

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