Abstracts

IMPATT Diode Circuit Design for Parametric Stability

J. Gonda and W.E. Schroeder. "IMPATT Diode Circuit Design for Parametric Stability." 1977 Transactions on Microwave Theory and Techniques 25.5 (May 1977 [T-MTT]): 343-352.

A new approach to IMPATT diode circuit design to achieve freedom from parametric instabilities is described. Necessary and sufficient conditions are described in the frequency domain for the load impedance presented to the diode terminals. A number of unconditionally stable circuits have been developed for flat-profile GaAs diodes using this approach. Three of these circuits have been built and tested experimentally in 11-GHz IMPATT oscillators and amplifiers. These experimental circuits have been free of parametric instability, even when driven into full RF saturation. In a systems application practical constraints such as cost, RF loss, and tunability will require compromises which will degrade the stability, and it may not always be possible to achieve complete stability for a given diode.

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