Abstracts

Computer Experiments on TRAPATT Diodes

W.J. Evans. "Computer Experiments on TRAPATT Diodes." 1970 Transactions on Microwave Theory and Techniques 18.11 (Nov. 1970 [T-MTT] (Special Issue on Microwave Circuit Aspects of Avalanche-Diode and Transferred Electron Devices)): 862-871.

Simplified analytical treatments of the TRAPATT mode of operation in avalanche diodes do not consider in sufficient detail the initial starting conditions for this mode. This paper examines this question in greater detail by analyzing a number of diode structures using a large-scale computer program. The results of these computer experiments have indicated that the requirements for efficient TRAPATT operation and the requirements for IMPATT operation diverge with increasing frequency. Since the IMPATT oscillation is required to start the TRAPATT mode, self-starting TRAPATT oscillators are increasingly difficult to fabricate as the operating frequency is increased. A novel diode structure is proposed which eliminates this problem and is capable of high-frequency CW TRAPATT operation.

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