# Abstracts

## Large-Signal Equivalent Circuits of Avalanche Transit-Time Devices

*P.T. Greiling and G.I. Haddad. "Large-Signal Equivalent Circuits of Avalanche Transit-Time Devices." 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)): 842-853.*

A large-signal analysis for IMPATT diodes is derived, which allows carrier multiplication by impact ionization to occur at every point in the diode. Therefore, the operating characteristics of IMPATT diodes with a wide range of realistic doping profiles can be investigated. For a given operating frequency, RF voltage, dc bias current, and doping profile, the admittance, power output, efficiency, bias voltage of a diode can be obtained. An equivalent circuit the diode package, microwave circuit mount and diode, is obtained experimentally. Using this circuit, the admittance of the diode is measured by a reflection-type circuit and an oscillator circuit as a function of the RF voltage, dc bias current, and frequency.

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