Abstracts

Circuit Behavior and Impedance Characteristics of Broad-Band TRAPATT-Mode Amplifiers

J.P. Quine. "Circuit Behavior and Impedance Characteristics of Broad-Band TRAPATT-Mode Amplifiers." 1979 Transactions on Microwave Theory and Techniques 27.1 (Jan. 1979 [T-MTT]): 23-31.

The characteristics of TRAPATT-mode high-efficiency oscillators and broadband amplifiers are reviewed. It is concluded that a broad-band amplifier like a high-efficiency oscillator should have capacitive circuit impedances and is distinguished from a high-efficiency oscillator principally by the number of important harmonics employed. A smaller number of harnonics for the amplifier can lead to broader bandwidth but lower efficiency. The relative merits of experimental amplifier circuits are discussed. It is shown that coaxial-line circuits employing diode packages with large lead inductances are characterized by harmonic impedances which can have large values over broad frequency bands. However, it is also shown that the device waveforms in this case are excessively degraded and relatively low-efficiency results. On the other hand, microstrip circuits with a Iow-impedance diode mount can provide broadband low impedances at both fundamental and third harmonic and have exhibited better performance.

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