Abstracts

J-Band Transferred-Electron Oscillators

M. Dean and M.J. Howes. "J-Band Transferred-Electron Oscillators." 1973 Transactions on Microwave Theory and Techniques 21.3 (Mar. 1973 [T-MTT]): 121-127.

An equivalent circuit for a J-band transferred-electron oscillator containing lumped and distributed elements is proposed. Using element values obtained independently, the equivalent circuit is shown to have broad-band applicability and is capable of explaining, in a strictly quantitative fashion, frequency saturation and the loss or absence of circuit-controlled oscillation. It is shown that the S4 type of encapsulation places severe constraints on the mounting structure and is not ideally suited to the J-band waveguide oscillator for optimum power-frequency characteristics over a broad band. The analysis of the full equivalent circuit given does, however, permit analytic solutions for important oscillator design parameters such as mounting post diameter, which enables simple post-mounted J-band oscillators that are free from frequency saturation and loss of circuit-controlled oscillation in the band to be easily designed.

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