# Abstracts

## Internal Dynamics and Microwave Properties of X-Band Transferred-Electron Devices

*R.A. Kiehl and R.L. Gunshor. "Internal Dynamics and Microwave Properties of X-Band Transferred-Electron Devices." 1976 Transactions on Microwave Theory and Techniques 24.4 (Apr. 1976 [T-MTT]): 165-172.*

A study of the internal dynamics and microwave properties of an X-band transferred-electron device having ohmic contacts is reported. Numerieal calculations of the electric field evolution and large-signal properties of the device have been carried out for frequencies throughout the 6-12-GHz range and for a wide range in ac voltage amplitude including amplitudes insufficient for space-charge quenching. An investigation is made of the influence of electron diffusion upon the field evolution and properties of the device. The large-signal admittance plane is determined and used to examine the behavior of the device in microwave circuits. A comparison is made between the calculated device properties and those of experimental devices. Circuit-controlled oscillation is found to be possible throughout the 6-12-GHz range for ac voltage amplitudes well below those required for space-charge quenching. At these amplitudes diffusion is shown to have a strong effect upon the electric field evolution and large-signal properties, and this effect is shown to bear significantly upon the behavior of the device in microwave circuits. Finally, the numerically calculated large-signal properties are found to agree reasonably well with experimental results.

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