

Millimeter-Wave InP Lateral Transferred-Electron Oscillators

S.C. Binari, R.E. Neidert, H.L. Grubin and K.E. Meissner. "Millimeter-Wave InP Lateral Transferred-Electron Oscillators." 1988 Transactions on Microwave Theory and Techniques 36.12 (Dec. 1988 [T-MTT] (1988 Symposium Issue)): 1695-1700.

We have investigated a lateral InP transferred-electron device (TED) designed with a high-resistivity notch adjacent to the cathode contact and demonstrated its application to millimeter-wave monolithic integrated circuits (MMIC's). At 29.9 GHz, a CW power output of 29.1 mW with a conversion efficiency of 6.7 percent has been obtained from cavity-tuned discrete devices. This result represents the highest power output and efficiency of a lateral TED in this frequency range. The lateral devices also had a CW power output of 0.4 mW at 98.5 GHz and 0.9 mW at 75.2 GHz. In addition, a monolithic oscillator incorporating the lateral TED has been demonstrated at 79.9 GHz. Experimental and theoretical results are presented which further the understanding of the lateral device operation.

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