Abstracts

Millimeter-Wave Heterojunction MITATT Diodes

N.S. Dogan, J.R. East, M.E. Elta and G.I. Haddad. "Millimeter-Wave Heterojunction MITATT Diodes." 1987 Transactions on Microwave Theory and Techniques 35.12 (Dec. 1987 [T-MTT] (1987 Symposium Issue)): 1308-1315.

A design theory, a fabrication procedure, and experimental results for heterojunction millimeter-wave transit-time devices operating in the IMPATT (impact ionization avalanche transit-time), MITATT (mixed panel-avalanche transit-time), or TUNNETT (tunnel transit-time) mode are presented. An approximate large-signal analysis is developed to investigate the power and efficiency of heterojunction transit-time devices. The results show that significant improvements in efficiency can be achieved by heterojunction structures. The fabrication process developed for the hetrojunction diodes and the millimeter-wave oscillator circuits used in the work are presented. The diodes were operated as oscillators between 65 and 93 GHz. A typical power output of 45 mW at 72 GHz for a 1-percent duty cycle, 1-µm pulse width operation was obtained.

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