Abstracts

GaAs TUNNETT Diodes

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The tunnel-injection-transit-time (TUNNETT) diode is operated at a high frequency and has a low-noise level compared to the IMPATT diode. The tunnel injection in a thin carrier generating region of the TUNNETT depends strongly on the electric-field intensity over 1000 kV/cm where the ionization of carriers can be neglected, leading to a higher efficiency performance than that of the IMPATT. GaAs TUNNETT diodes with p+-n and p+-n-n+ structures have been fabricated by a new LPE method (the temperature-difference method under controlled vapor pressure). The fundamental oscillation at frequencies from about 100 up to 248 GHz has been obtained from the pulse-driven p+-n-n+ diodes. This paper describes the details of the oscillation characteristics of GaAs TUNNETT diodes.

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