Abstracts

An Analysis of an Electronically Tunable n-GaAs Distributed Oscillator

A. Aishima and Y. Fukushima. "An Analysis of an Electronically Tunable n-GaAs Distributed Oscillator." 1984 Transactions on Microwave Theory and Techniques 32.2 (Feb. 1984 [T-MTT]): 157-164.

The effective Schottky-barrier height of a contact to n-GaAs can be designed arbitraily by interposing a thin, highly doped layer between a metal and n-GaAs and by controlling the thickness optimally. An n-GaAs diode with a Schottky-barrier cathode exhibits various space-charge modes depending on the barrier height. A traveling dipole domain mode in an n-GaAs diode changes into a cathode trapped domain mode as the injection current at the cathode decreases. It has been shown that an n-GaAs diode, which operates in a cathode trapped domain mode, exhibits a negative conductance over a fairly wide frequency range. A super semiconductor. wide-band electronically tunable distributed oscillator can he achieved by inserting an n-GaAs diode with a suitably designed Schottky-barrier cathode between resonant microstriplines in place of conventional dielectric material. It has been shown that the frequency of the distributed oscillator would be electronically tunable over a fairly wide frequency range from 9 to 26 GHz.

❑ Return to main document.