Abstracts

A Comparison of the Performance of Millimetre-Wave Semiconductor Oscillator Devices and Circuits

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A comparison of the commonly used millimetre-wave semiconductor devices is made; the Si IMPATT, GaAs TED and InP TED. The comparison is made on the basis of the primary characteristics of output power and efficiency as well as the secondary effects of amplitude and frequency stability, including a.m. and f.m. noise. A review of the waveguide circuit techniques employed with these devices is presented, emphasizing the size limitation and susceptibility to severe environmental loadings. A miniature microstrip oscillator structure employing an InP TED as the active element is described. This source has produced 32 mW at 81 GHz in microstrip and highlights the potential suitability for rugged, integrated transmitter/receiver subsystems operating at millimetre wave frequencies.

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