Millimeter-Wave Monolithic Gunn Oscillators

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A millimeter-wave monolithic GaAs Gunn oscillator has been designed, fabricated and tested. Epitaxial layers were grown by conventional vapor phase epitaxy on semi-insulating substrate. The matching circuit and bias circuitry were monolithically fabricated on the same chip as the active device. With no external tuning, the oscillator chip delivers 1 mW and 1.5 mW at 68.4 GHz and 44.9 GHz, respectively. The best performance was achieved at 41.6 GHz with 4 mW output power. This is the first fully monolithic Gunn oscillator ever reported at these frequencies.

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