Abstracts

Multi-Diode Ka-Band Oscillators Using Hybrid Planar Circuit Design

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Design and performance of integrated power combining Ka-band oscillators will be presented in this paper. Planar circuitry is employed for DC-biasing and matching of the semiconductor devices, whereas the resonator is built up using waveguide techniques. Thus high Q-factor of the waveguide is combined with planar fabrication techniques. TWO and FOUR diode power combining devices have been realized. Up to 630 mW CW-output power at 34 GHz has been achieved using Gunn-elements. The maximum total efficiency amounts to more than 4%. A VCO with 700 MHz tuning range delivers an output power of around 60 mW at 33 GHz. Several 39.5 GHz Gunn oscillators with integrated harmonic mixer (factor 11) have been built for a phase locked communication system. The output power ranges from 80 to 150 mW with a single Gunn-element.

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