Abstracts

Silicon Monolithic MM-Wave Integrated Circuit (SIMMWIC) Devices Mounted Up-Side-Down on a Copper Heat Sink Integral with Cavity Resonator

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Silicon monolithic mm-wave integrated circuits (SIMMWIC) used as oscillators in radar system applications in the 60-80 GHz regime are mounted on a heat sink with integrated resonator. The heat sink consisits of a thin carrier plate (aluminum nitride (AIN) or copper (Cu)) and and a gold plated copper block with integrated resonator cavity. The resonator cavity is formed by a rectangular cavity milled in the Cu block, terminated on the top by the gold plated carrier plate on top of which a mm-wave emitting integrated coplanar slot transmitter is mounted up-side-down. The main part of the emitted RF power is radiated through the substrate-perpendicular to the chip plane-the other part is coupled through a slit on the carrier plate into the resonator cavity leading to a higher spectral purity and a stabilization of the oscillating frequency.

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