Abstracts

Fabrication and Performance of Separately-Biasable Antiparallel-Pair "T-Anode" Mixer Diodes Employing a Compact Multiple-Layer Integrated Bias Circuit at 210 GHz

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A 210 GHz waveguide subharmonically-pumped mixer with integrated antiparallel-pair planar "T-anode" Schottky diodes and a novel compact multiple-layer bias circuit has been successfully fabricated and measured. The diode anodes are defined by electron-beam lithography using technology similar to that employed for T-gate transistors. A compact multiple-layer filter structure provides individual biasing capability for each diode, which reduces the required local oscillator power for subharmonic mixing. Unbiased, a DSB mixer noise temperature of 1420 K was achieved with 6.4 mW of required LO power. Using separate diode bias to reduce the required LO power to 3.2 mW, the noise temperature increased slightly to 1640 K. This is the lowest noise temperature reported for a separately biased mixer at this frequency.

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