Abstracts

Planar diode solid-state receiver for 557 GHz with state-of-the-art performance

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The design and performance of a subharmonically pumped (SHP) 557-GHz mixer driven by a solid-state local oscillator (LO) are reported. Whisker contacts are not required as both the mixer and LO utilize planar Schottky devices. A measured mixer noise temperature of 2100-K double sideband (DSB) with a conversion loss of 8.9 dB has been achieved at room temperature. The mixer exhibits broad intermediate frequency (IF) bandwidth with measured DSB noise temperatures below 3400 K in the band from 1.5 to 17 GHz. An external 6-18-GHz amplifier has been added to the output of the mixer, and measured receiver noise temperatures below 7300 K have been measured across the IF band. The results are believed to represent state-of-the-art performance for a room-temperature broad-band solid-state receiver at this frequency.

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