Abstracts

A W-band self-oscillating subharmonic MMIC mixer

M.J. Roberts, S. Iezekiel and C.M. Snowden. "A W-band self-oscillating subharmonic MMIC mixer." 1998 Transactions on Microwave Theory and Techniques 46.12 (Dec. 1998, Part I [T-MTT]): 2104-2108.

A novel 77 GHz subharmonically pumped self-oscillating mixer has been implemented using monolithic-microwave integrated-circuit (MMIC) technology. The microstrip mixer achieves mixing and doubling simultaneously using a single 4 /spl mu/m/spl times/15 /spl mu/m/spl times/0.15 /spl mu/m gate-length pseudomorphic high electron-mobility transistor, eliminating the need for an external local oscillator. The total circuit size is 1 mm/spl times/2 mm, including coplanar probing pads. The mixer exhibits a measured double-sideband (DSB) conversion loss of 11.0 dB at 77.6 GHz and an average measured DSB conversion loss of 15 dB from 70 to 85 GHz, which compares well with simulated results. To the authors' knowledge, this is the first demonstration of a subharmonically pumped MMIC self-oscillating mixer operating with state-of-the-art performance at W-band frequencies.

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