Abstracts

A 60-GHz uniplanar MMIC 4/spl times/ subharmonic mixer

M.W. Chapman and S. Raman. "A 60-GHz uniplanar MMIC 4/spl times/ subharmonic mixer." 2002 Transactions on Microwave Theory and Techniques 50.11 (Nov. 2002 [T-MTT] (Mini-Special Issue on the 2002 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 2580-2588.

A uniplanar GaAs monolithic microwave integrated circuit /spl times/4 subharmonic mixer (SHM) has been fabricated for 60-GHz-band applications using an antiparallel diode pair in finite ground coplanar (FGC) waveguide technology. This mixer is designed to operate at an RF of 58.5-60.5 GHz, an IF of 1.5-2.5 GHz, and an LO frequency of 14-14.5 GHz. FGC transmission-line structures used in the mixer implementation were fully characterized using full-wave electromagnetic simulations and on-wafer measurements. Of several mixer configurations tested, the best results show a maximum conversion loss of 13.2 dB over the specified frequency range with a minimum local-oscillator power of 3 dBm. The minimum upper sideband conversion loss is 11.3 dB at an RF of 58.5 GHz and an IF of 2.5 GHz. This represents excellent performance for a 4/spl times/ SHM operating at 60 GHz.

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