Abstracts

An MMIC V-band phase-locked oscillator using a GaAs MMIC sampling phase detector

A. Kanda, T. Nakagawa, T. Hirota, H. Okazaki and M. Nakamae. "An MMIC V-band phase-locked oscillator using a GaAs MMIC sampling phase detector." 1997 Transactions on Microwave Theory and Techniques 45.5 (May 1997, Part I [T-MTT]): 659-665.

A V-band full-monolithic phase-locked oscillator (PLO) has been developed. All the circuits are integrated into three monolithic microwave integrated circuit (MMIC) chips. One is a highly integrated multifunction MMIC for 15-GHz voltage-controlled oscillation and 15-30-GHz frequency doubling. The second is for 30-60-GHz frequency doubling. The third is a sampling phase detector (SPD) chip, which operates up to 20 GHz and can be driven at 0-dBm power. Each circuit is greatly reduced in size by using a uniplanar structure; the oscillator area is only 5.5 mm/sup 2/ and the SPD area is 3.0 mm/sup 2/. The PLO exhibits output power of 3.5 dBm with single-sideband (SSB) phase noise in the phase-locked state of -64 dBc/Hz at 10 kHz offset from 60.0 GHz in spite of the low Q full-monolithic oscillator circuitry.

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