Abstracts

Fully integrated 94-GHz subharmonic injection-locked PLL circuit

S. Kudszus, M. Neumann, T. Berceli and W.H. Haydl. "Fully integrated 94-GHz subharmonic injection-locked PLL circuit." 2000 Microwave and Guided Wave Letters 10.2 (Feb. 2000 [MGWL]): 70-72.

A new integrated W-band frequency source MMIC is presented which consists of a 94 GHz voltage-controlled oscillator (VCO) with large tuning range and a phase comparator, forming a subharmonic injection-locked phase-locked loop (ILPLL). The ILPLL combines conventional injection-locking with an additional phase control loop to improve the locking range of the oscillator significantly. The 4th subharmonic frequency is used as the reference signal. The locking range was increased from 80 MHz without ILPLL to 4.5 GHz with ILPLL by closing the loop with an external DC amplifier. A phase noise of -83 dBc/Hz at 100 kHz offset was achieved. Pseudomorphic GaAs HEMT's and a coplanar circuit topology were used to allow integration into complex single-chip subsystems and flip-chip packaging.

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