Abstracts

GaAs-Monolithic IC's for an X-Band PLL-Stabilized Local Source

M. Madihian and K. Honjo. "GaAs-Monolithic IC's for an X-Band PLL-Stabilized Local Source." 1986 Transactions on Microwave Theory and Techniques 34.6 (Jun. 1986 [T-MTT]): 707-713.

X-band GaAs-monolithic voltage controlled-oscillator (VCO), divide-by-four analog frequency divider, and Wilkinson power splitter have been developed for frequency stabilization of an X-band Iocal source in a phase-locked loop (PLL) system.The VCO has a series feedback configuration and utilizes an optimized design procedure to yield the highest dc-RF efficiency ever reported for a GaAs-monolithic FET oscillator. The frequency divider has a novel structure which applies a dual-gate FET mixer and two RC-coupled FET amplifier stages to establish a closed loop for generating a 1/4 subharmonic component of an input frequency. The Wilkinson power splitter consists of an isolation resistor and two quarter-wavelength lines, which have been realized in both meander and spiral forms. A VCO-driven frequency divider system incorporating these IC’s consumes 380-mW total power to provide the 1/4 subharmonic component of the VCO frequency with more than 3-dBm output power over a 10.86--11.01-GHz range.

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