Abstracts

Locking performance analysis of MESFET subharmonically injection-locked oscillator

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Subharmonically injection locking to an oscillator is an approach to obtain a stable source operated in microwave of millimeter-wave regions. In this paper, we present the formulation and results on the locking performance of metal-semiconductor field-effect transistor (MESFET) subharmonically injection-locked oscillator (SILO). Nonlinear-state equations of SILO are derived based on the use of a power series expression for MESFET nonlinear elements. The locking performance includes SILO output power, conversion gain, locking bandwidth, and the critical injection-locking signal level. The derived formulation is useful in the design of a MESFET SILO. Simulation results are shown to be in good agreement with those of experimental test measurement.

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