Abstracts

A 100-MESFET Planar Grid Oscillator

Z.B. Popovic, R.M. Weikle, II, M. Kim and D.B. Rutledge. "A 100-MESFET Planar Grid Oscillator." 1991 Transactions on Microwave Theory and Techniques 39.2 (Feb. 1991 [T-MTT]): 193-200.

In this work we present a 100-MESFET oscillator which gives 21 W of CW effective radiated power (ERP) with a 16 dB directivity and a 20% dc to RF conversion efficiency at 5 GHz. The oscillator is a planar grid structure periodically loaded with transistors. The grid radiates and the devices combine quasi-optically and lock to each other. The oscillator can also be quasi-optically injection-locked to an external signal. The planar grid structure is very simple. All of the devices share the same bias, and they can be power and frequency tuned with a mirror behind the grid or dielectric slabs in front of it. An equivalent circuit for an infinite grid predicts the mirror frequency tuning. The planar property of the oscillator offers the possibility of a wafer-scale monolithically integrated source. Thousands of active solid-state devices can potentially be integrated in a high-power source for microwave or millimeter-wave applications.

❑ Return to main document.