Abstracts

Computer-Aided Analysis of Free-Running Microwave Oscillators

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Traditionally, the design of microwave oscillators has been based on small-signal analysis techniques, which generally produced good results. However, large-signal simulations are often necessary to provide a more accurate characterization of oscillator performance. In this paper, an algorithm for free-runing oscillator analysis is presented. Kurokawa's oscillation condition is coupled with the modified nodal admittance form of the circuit equations to avoid degenerate solutions. The algorithm has been implemented using both harmonic balance and frequency-domain spectral balance techniques. The oscillator analysis was applied to the simulation of a monolithically integrated varactor-tuned MESFET oscillator. Good agreement between simulated power and oscillation frequency results and the measured data was obtained.

❑ Return to main document.