Abstracts

Transient simulation of millimeter-wave circuits incorporating numerical device modeling

G.B. Tait and S.H. Jones. "Transient simulation of millimeter-wave circuits incorporating numerical device modeling." 1999 Transactions on Microwave Theory and Techniques 47.6 (Jun. 1999, Part II [T-MTT]): 877-881.

A fast convolution-based computational approach is employed to integrate numerical solid-state device simulation with nonlinear millimeter-wave circuit simulation. Unlike previous combined harmonic-balance/device approaches, the high-frequency circuit/physical device response is allowed to evolve in time to its natural steady-state mode of operation, permitting insight into harmonic and parametric energy exchange, stability, load pulling, and frequency tuning effects. To demonstrate this computationally efficient approach, a second-harmonic 150-GHz transferred electron oscillator is simulated using both conventional Gunn and novel stable-depletion-layer InP devices. The integrated device/circuit simulations in the time domain enable us to investigate the formation and buildup of the oscillation modes in detail.

❑ Return to main document.