Abstracts

Investigation of FECTED performance for millimeter-wave applications

F. Driouch and C. Dalle. "Investigation of FECTED performance for millimeter-wave applications." 2001 Transactions on Microwave Theory and Techniques 49.7 (Jul. 2001 [T-MTT]): 1333-1341.

The potential of GaAs, Ga/sub 0.47/In/sub 0.53/As, and InP field-effect cathode transferred-electron device (FECTED) oscillators is theoretically investigated at millimeter wave. The modeling relies on a general time-domain electronic circuit simulator including a quasi-two-dimensional bipolar hydrodynamic FECTED model. Pure sine simulations have been performed to optimize the device structure and performance at various typical frequencies in a self-consistent manner, together with thermal and electronic limitations. The optimization is focused on a reliable and high negative resistance level device based on a dipolar-layer single transit mode. By means of transient simulations, we next demonstrate the feasibility of simple front-end FECTED circuits for short-range pulsed and frequency-modulation continuous-wave millimeter-wave radars.

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