Abstracts

Millimeter-wave pulsed oscillator global modeling by means of electromagnetic, thermal, electrical, and carrier transport physical coupled models

S. Beaussart, O. Perrin, M.-R. Friscourt and C. Dalle. "Millimeter-wave pulsed oscillator global modeling by means of electromagnetic, thermal, electrical, and carrier transport physical coupled models." 1999 Transactions on Microwave Theory and Techniques 47.6 (Jun. 1999, Part II [T-MTT]): 929-934.

The time domain modeling of the operation of a 94-GHz pulsed silicon IMPATT oscillator, based on a physical approach, is described in this paper. It relies on the coupling of electrical, thermal, electromagnetic, and carrier transport physical models. The model has been used to study the high-power stable operation of a 94-GHz oscillator. The results of a comparison between simulations, using two different types of passive radio-frequency load circuits, including experimental measurements, are presented and discussed. They tend to demonstrate that it is now possible to develop accurate millimeterwave-circuit predictive models even for application based on a nonlinear thermal and electrical transient operation such as IMPATT oscillators.

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