Abstracts

Current Saturation in Submillimeter Wave Varactors

E.L. Kollberg, T.J. Tolmunen, M.A. Frerking and J.R. East. "Current Saturation in Submillimeter Wave Varactors." 1992 Transactions on Microwave Theory and Techniques 40.5 (May 1992 [T-MTT]): 831-838.

In semiconductor devices the speed of electrons cannot exceed certain limits. This phenomenon will affect varactor multipliers as well as other high frequency devices where the RF current through the active part of the device is primarily displacement current. Hence, we expect at some point "saturation" of the varactor output power. We will, in this paper, discuss this phenomenon in some detail and show that it severely deteriorates the multiplier performance at higher frequencies. Single barrier varactors (SBV) should have an advantage over GaAs Schottky diode varactors because they can be fabricated on InAs and stacked in a series array, allowing for lower current densities and higher power handling.

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