Abstracts

Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources

C. Dalle and P.-A. Rolland. "Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 366-372.

The potential RF performance of various types of silicon IMPATT homojunction structures has been systematically investigated in order to define the one that is most efficient for reliable high-power, high-efficiency CW generation in the 94 GHz window. The comparison has been carried out by means of an IMPATT oscillator model accounting, in a self-consistent manner, for both the thermal limitation and the diode impedance matching. The main result is that in contrast to lower operating frequencies, the realization of a Read doping profile does not improve the RF performance level compared to flat doping profile structures. High RF emitted performance has been predicted under optimum operating conditions. In addition, the fundamental influences on RF performance of both the diode thermal resistance and RF losses have been quantified.

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