

论文

亚微米GaAs MESFET二维数值模拟

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摘要

本文用计入热电子效应的动量能量守恒模型讨论了亚微米GaAs MESFET二维数值模拟。为了减少计算量进行了模型简化和算法选择。文中给出并分析了三种典型器件的模拟范果, 根据模拟结果, 研究了小尺寸器件中的速度过冲效应并得出常规的漂移扩散模型的适拟结论。

关键词 [This paper deals with 2-D simulation of GaAs MESFET, which includes velocity overshoot effects by using energy transport model suitable for submicron devices. Computation time is greatly reduced by simplifying model and using fast convergence algorithms, e.g. Gummel iteration and 1CCG method. The program shows good stability and convergence. Several types of GaAs MESFET structures, e.g. epitaxial, ion-implanted and buried p-layer, have been simulated. The results show that buried p-layer can decrease carrier's injecting into substrate and improve device performance. The results was also used to study carefully the velocity overshoot effects. By comparison of results obtained from energy transport model and drift-diffusion model, the limitation of drift-diffusion model was derived.](#)

分类号

TWO-DIMENSION NUMERICAL SIMULATION OF SUBMICRO-SCALE GaAs MESFET

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Abstract

半导体物理; 半导体器件; 模拟; 数值分析

Key words [Semiconductor physics](#) [Semiconductor device](#) [Simulation](#) [Numerical analysis](#)

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