

高热稳定性多发射极功率SiGe HBT的研制

金冬月, 沈珮, 张万荣, 王扬, 沙永萍, 何莉剑, 张蔚, 谢红云

(北京工业大学 电子信息与控制工程学院, 北京 100022)

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摘要 成功研制出具有非均匀发射极条间距结构的多发射极功率SiGe 异质结双极晶体管(HBT), 用以改善功率器件热稳定性。实验结果表明, 在相同的工作条件下, 与传统的均匀发射极条间距结构HBT相比, 非均匀发射极条间距结构HBT的峰值结温降低了15.87K。对于同一个非均匀发射极条间距结构SiGe HBT, 在不同偏置条件下均能显著改善有源区温度分布。随着偏置电流IC的增加, 非均匀发射极条间距结构SiGe HBT改善峰值结温的能力更为明显。由于峰值结温的降低以及有源区温度分布非均匀性的改善, 非均匀发射极条间距功率SiGe HBT可以工作在更高的偏置条件下, 具有更高的功率处理能力。

关键词 [SiGe](#) [异质结双极晶体管](#) [功率](#)

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Multi-finger power SiGe HBT with high thermal stability

JIN Dong-yue, SHEN Pei, ZHANG Wan-rong, WANG Yang, SHA Yong-ping, HE Li-jian, ZHANG Wei, XIE Hong-yun

(College of Electronic Information and Control Engineering, Beijing University of Technology, Beijing 100022, China)

Abstract

A multi-finger power SiGe heterojunction bipolar transistor (HBT) with non-uniform finger spacing was fabricated to improve the thermal stability. Experimental results show that the peak temperature of SiGe HBT with non-uniform finger spacing is lowered by 15.87K compared with that of uniform finger spacing HBT under the same operational condition. The temperature profile across the device can be improved obviously at different biases for the same HBT with non-uniform finger spacing. With the increase of IC, the capability of HBT with non-uniform finger spacing to improve the temperature profile is more significant. Because of the decrease in peak temperature and the improvement of temperature profile, the power SiGe HBT with non-uniform spacing can operate at a higher bias and hence has higher power handling capability.

Key words [SiGe](#) [HBT](#) [power](#)

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通讯作者

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