

DCIV 技术提取辐照前后 PDSOI 器件背栅界面态密度

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摘要: 直流电流电压(DCIV)技术受应用于智能剥离技术制造的PDSOI中硅/二氧化硅界面质量的研究.本文通过将样品进行钴60伽马射线辐照,用以监测PDSOI器件背沟道界面在总剂量辐照前后的变化情况.本文给出了完整的测试原理、实验流程和结果分析,不仅提取了辐照前后PDSOI器件的背界面陷阱密度以及它所在的等效能级,而且得到了界面陷阱能级密度在硅禁带中随能级变化的U型分布图(以禁带中央附近为主),为后续PDSOI器件的抗辐照加固提供了参考.

关键词: 直流电流电压方法; PDSOI器件; 总剂量效应; 背沟道; 界面态; 钴60伽马射线

DCIV Technique for Extracting BackGate Interface Traps Density

in Non-irradiated and Irradiated PDSOI Devices

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Abstract: Direct Current Current Voltage(DCIV) technique has been applied to study the Si-film/SiO₂ interface quality of Partially Depleted SOI that were fabricated on a SMART-CUT wafer. the samples were exposed to Co-60 gamma rays irradiation to monitor the development of PDSOI back-channel interface states. The paper gives the integrated measurement mechanism, experiment flow and result analysis, then it can not only obtain the back-channel interface trap density and its equivalent energy level, but also can calculate the u-shape map (mainly in near the center of the silicon forbidden zone) of the interfacial trap energy density with the change of energy level in the silicon forbidden zone, which provides reference for the enhancing of PDSOI devices.

Key words: direct current current voltage method; PDSOI devices; total dose effect; back-channel; interface traps; Co-60 gamma rays

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