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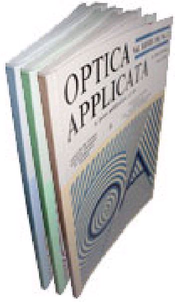

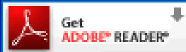

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Influence of high pressure annealing on electrical properties of surface layer of neutron irradiated or germanium-doped Czochralski-grown silicon

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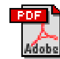
Keywords

germanium-doped silicon, neutron-irradiated silicon, defects

Abstract

The effect of annealing at 720-920 K under enhanced pressure (up to 1.1 GPa) in argon ambient on electrical properties of the surface layer of the Czochralski-grown silicon (Cz-Si) subjected to neutron irradiation (doses of up to 1×10^{17} cm^{-2}, E = 5 MeV) or germanium doping (doping level 7×10^{17} cm^{-3}) was investigated by electrical *C-V*, *I-V* and admittance method. The stress-induced decrease in electron concentration was observed in both *p*- and *n*-type samples after neutron irradiation and annealing under a pressure of 1.1 GPa at 720 K for 10 hours, while in the germanium doped samples an ascending dependence of the creation of thermal donors and lack of dependence of new donors on hydrostatic pressure was observed. The effects observed can be explained as resulting, among others, from the irradiation-induced defects (generation of thermal acceptors) and pressure stimulated creation of thermal donors in germanium-doped silicon.

 173.6 kB

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