

Properties of Mg doped GaAs Epitaxial Layers Grown Subjected to Rapid Thermal Annealing

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We investigated the optical and electrical properties of Mg doped GaAs epitaxial layers grown on semi-insulator GaAs (100) made by molecular beam epitaxy (MBE) with different doping concentrations. The samples were grown by varying two growth parameters such as growth temperature (460~580°C) and arsenic (As) beam equivalent pressure (BEP) ($7.4 \times 10^{-6} \sim 1.6 \times 10^{-5}$ Torr) in order to obtain the optimum condition of p-type doping. And the samples were annealed by various RTA temperature (550°C, 600°C, 650°C, 700°C, 750°C). The structural and optical properties of Mg-doped GaAs layers were measured by double crystal x-ray diffraction (DCXRD) and photoluminescence (PL), respectively. Hall and capacitance voltage (C-V) measurements were employed to investigate the electrical properties of Mg doped GaAs layers at room temperature. The results indicate Mg can be used well controllable p-type dopant on the GaAs epitaxial layers for nano structure devices.