Abstract

Monocrystalline semiconductor wafer comprising defect-reduced regions and method for producing it

The invention relates to a monocrystalline semiconductor wafer having defect-reduced regions, wherein said defect-reduced regions have a density of the GOI-relevant defects within the range of 0/cm^2 to 0.1/cm^2 and occupy overall an area proportion of 10% to 100% of the planar area of the semiconductor wafer, wherein the remaining regions of the semiconductor wafer have a significantly higher defect density than the defect-reduced regions.

The invention also relates to a method for annealing GOI-relevant defects in a monocrystalline semiconductor wafer, wherein defined regions of at least one side of the semiconductor wafer are irradiated by means of a laser, wherein each location within the defined regions is irradiated with a power density of 1 GW/m^2 to 10 GW/m^2 for a duration of at least 25 ms, wherein the laser emits radiation having a wavelength lying above the absorption edge of the semiconductor material of which the semiconductor wafer is composed, and wherein the temperature of the semiconductor wafer rises by less than 20 K as a result of the irradiation by means of the laser.

Fig. 3