

Abstract

Semiconductor wafer composed of single-crystal silicon and process for producing a semiconductor wafer composed of single-crystal silicon

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Semiconductor wafer composed of single-crystal silicon having a front side, a rear side, a middle and a periphery and production thereof, wherein the semiconductor wafer comprises:

an Nv region which extends from the middle to the periphery;

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a denuded zone which extends from the front side to a depth of not less than 20 μm into the interior of the semiconductor wafer, where the density of vacancies in the denuded zone, determined by means of platinum diffusion and DLTS is not more than 1×10^{13} vacancies/ cm^3 ;

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a concentration of oxygen of not less than 4.5×10^{17} atoms/ cm^3 and not more than 5.5×10^{17} atoms/ cm^3 ;

a region in the interior of the semiconductor wafer which adjoins the denuded zone and has nuclei which can be developed by means of a heat treatment into BMDs having a peak density of not less than $6.0 \times 10^9/\text{cm}^3$, where the heat treatment comprises heating the semiconductor wafer to a temperature of 800 °C over a period of four hours and to a temperature of 1000 °C over a period of 16 hours.

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Drawing for abstract: Fig.4