Abstract

Epitaxially coated silicon wafer and method for producing an epitaxially coated silicon wafer

The invention relates to an epitaxially coated silicon wafer having a front side, a rear side and an edge region comprising a rounded and polished edge of the silicon wafer and also a region that is adjacent to the edge and has a width of in each case 3 mm on the front and rear sides, characterized by a surface roughness in that edge region of 0.1-1.5 nm RMS relative to a spatial wavelength range of 10-80 µm and also by a variation of the surface roughness of 1-10%.

The invention also relates to a method for producing an epitaxially coated silicon wafer, comprising the following process sequence: (a) providing a group of silicon wafers having rounded edges; (b) polishing the edges of the silicon wafers; (c) cleaning the silicon wafers; (d) examining the edge regions of the group of silicon wafers with regard to defects and edge roughness, wherein the edge region in each case comprises the rounded and polished edge of the silicon wafer and also a region that is adjacent to the edge and has a width of in each case 3 mm on the front and rear sides, and also selecting a silicon wafer from the group of silicon wafers which has a surface roughness of less then 1 nm RMS relative to a spatial wavelength range of 10-80 µm; (e) pretreating the selected silicon wafer in a single-wafer epitaxy reactor, wherein, in a first step, a treatment in a hydrogen atmosphere at a flow rate of 1-100 slm is effected and, in addition, in a second step, an etching medium with a flow rate of 0.5-5 slm is conducted into the edge region of the silicon wafer by means of a gas distribution device; (f) epitaxially coating the silicon wafer.

Figure 1