

Title (en)

DOPING OF A SILICON SUBSTRATE BY LASER DOPING WITH A SUBSEQUENT HIGH-TEMPERATURE STEP

Title (de)

DOTIEREN EINES SILIZIUMSUBSTRATS DURCH LASERDOTIERUNG MIT ANSCHLIESSENDEM HOCHTEMPERATURSCHRITT

Title (fr)

DOPAGE DE SUBSTRAT DE SILICIUM PAR DOPAGE LASER AVEC UNE ÉTAPE ULTÉRIEURE À HAUTE TEMPÉRATURE

Publication

EP 4402728 A1 20240724 (DE)

Application

EP 21782461 A 20210917

Priority

EP 2021075723 W 20210917

Abstract (en)

[origin: WO2023041177A1] A method of doping a silicon substrate (1), especially for a solar cell (25), comprises: coating a surface of the silicon substrate with a layer stack (7) composed of at least two glass layers (9, 11), such that the layer stack covers at least a first region (3) to be doped and a second region (5) to be doped of the silicon substrate, wherein the layer stack comprises a first glass layer (9) containing boron as p-type dopant and a second glass layer (11) containing phosphorus as n-type dopant; irradiating the first region covered by the layer stack with laser radiation (17) in such a way that dopant is introduced into the silicon substrate close to the surface predominantly from the one of the two glass layers closer to the surface of the silicon substrate than the other of the two glass layers, and the layer stack is ablated in order to obtain a doped first region from which the layer stack has been ablated, wherein the second region covered by the layer stack is not irradiated with the laser radiation and hence the layer stack is not ablated there; and, subsequently, heating the silicon substrate in a furnace (19) to a temperature of at least 700°C such that dopant is introduced into the silicon substrate close to the surface predominantly from one of the two glass layers, in order to obtain a doped second region, the doping of which differs in polarity and/or doping intensity from a doping of the doped first region.

IPC 8 full level

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