

Title (en)

METHOD FOR MANUFACTURING ELECTRICALLY CONDUCTIVE CONTACTS ON SOLAR CELLS

Title (de)

VERFAHREN ZUM HERSTELLEN VON ELEKTRISCH LEITENDEN KONTAKTEN AUF SOLARZELLEN

Title (fr)

MÉTHODE DE FABRICATION DE CONTACTS ÉLECTRIQUEMENT CONDUCTEURS SUR DES CELLULES SOLAIRES

Publication

**EP 2652803 A2 20131023 (DE)**

Application

**EP 11804998 A 20111215**

Priority

- DE 102010061296 A 20101216
- EP 2011072978 W 20111215

Abstract (en)

[origin: WO2012080428A2] The invention relates to a method for producing contacts made of electrically conductive material on a group of solar cells, wherein at least the following method steps are used for at least one solar cell from the group of solar cells: a) homogeneously applying a dopant source to at least one face of a substrate made of crystalline silicon over the whole area, b) forming phosphosilicate glass by diffusing dopant into the substrate in a first temperature step at a temperature T1 over a time t1, c) locally applying laser radiation to the substrate in regions in which the electrically conductive material is to be applied in order to form the electrically conductive contacts, wherein the phosphosilicate glass is removed before or after the application of the laser radiation, d) measuring the layer resistivity  $\rho_{SH}$  developed in the surface region of the substrate on the dopant source side, both in and laterally outside of the lasered area, as a function of the pulse energy density of the laser beam applied to the substrate, e) applying the electrically conductive material to the lasered areas, f) measuring the specific contact resistance between the lasered area and the electrically conductive material applied thereto as a function of the pulse energy density of the laser beam applied to the substrate, g) determining a pulse energy density range of the laser beam from the measure values for which the layer resistivity  $\rho_{SH}$  in the lasered area is reduced between 0% and 30% compared to the layer resistivity outside the lasered area and the specific contact resistance between the lasered area and the electrically conductive material applied thereto for forming the electrical conductive contact is between 0 mOcm<sup>2</sup> and 10 mOcm<sup>2</sup>, h) applying laser radiation having a pulse energy density within the determined pulse energy density range to the remaining solar cells from the group in the areas of the solar cells to be contacted after performing at least the steps a) and b).

IPC 8 full level

**H01L 31/18** (2006.01)

CPC (source: EP US)

**H01L 31/02021** (2013.01 - US); **H01L 31/022425** (2013.01 - EP US); **H01L 31/0288** (2013.01 - EP US); **H01L 31/068** (2013.01 - EP US); **H01L 31/1804** (2013.01 - EP US); **Y02E 10/547** (2013.01 - EP US); **Y02P 70/50** (2015.11 - EP US)

Citation (search report)

See references of WO 2012080428A2

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

**WO 2012080428 A2 20120621**; **WO 2012080428 A3 20130124**; CN 103339746 A 20131002; CN 103339746 B 20151209; DE 102010061296 A1 20120621; EP 2652803 A2 20131023; US 2014000698 A1 20140102

DOCDB simple family (application)

**EP 2011072978 W 20111215**; CN 201180060814 A 20111215; DE 102010061296 A 20101216; EP 11804998 A 20111215; US 201113994841 A 20111215