Title (en)

METHOD FOR LOCAL HIGH-DOPING AND CONTACTING OF A SEMICONDUCTOR STRUCTURE WHICH COMPRISES A SOLAR CELL OR A PRECURSOR OF A SOLAR CELL

Title (de)

VERFAHREN ZUR LOKALEN HOCHDOTIERUNG UND KONTAKTIERUNG EINER HALBLEITERSTRUKTUR, WELCHE EINE SOLARZELLE ODER EINE VORSTUFE EINER SOLARZELLE IST

Title (fr)

PROCÉDÉ DE DOPAGE ÉLEVÉ LOCAL ET DE MISE EN CONTACT D'UNE STRUCTURE SEMI-CONDUCTRICE QUI EST UNE CELLULE SOLAIRE OU UNE ÉBAUCHE DE CELLULE SOLAIRE

Publication

EP 2529405 A2 20121205 (DE)

Application

EP 11701006 A 20110118

Priority

- DE 102010006315 A 20100129
- EP 2011000180 W 20110118

Abstract (en)

[origin: WO2011091959A2] The invention relates to a method for local high-doping and contacting of a semiconductor structure which comprises a solar cell or a precursor of a solar cell and has a silicon semiconductor substrate (1) of a base doping type. The high-doping and contacting is effected by producing a plurality of local high-doping regions of the base doping type in the semiconductor substrate (1) on a contacting side (1 a) of the semiconductor substrate and applying a metal contacting layer (7) to the contacting side (1 a) or, if applicable, one or more intermediate layers wholly or partially covering the contacting side (1 a), to form electrically conductive connections between the metal contacting layer (7) and the semiconductor substrate (1) at the high doping regions. It is important that the method comprises the following steps: A) producing a layer structure covering the contacting side (1 a) of the semiconductor substrate, comprising a doping layer (3), which contains a dopant of the base doping type and is in the form of a layer of amorphous silicon or a layer of amorphous silicon carbide having a carbon content less than 10 at.% and a reflective layer (4), which at least in the wavelength range between 800 nm and 1200 nm is constructed with a refractive index n R smaller than the refractive index n Hs of the semiconductor substrate, wherein the doping layer (3) lying in the layer sequence closer to the contacting side (1 a) is constructed as the reflective layer (4); B) local heating of layer structure and the surface lying thereunder of the semiconductor substrate at a plurality of zones to form local high-doping regions, wherein the local heating is effected such that at each of the locally heated regions a melt mixture of at least the doping layer (3) and a portion of the semiconductor substrate is formed locally on the contacting side (1 a), and on solidification of the melt mixture a high doping region (6) more strongly doped by at least the dopant of the doping layer (3) is formed in the semiconductor substrate (1) on the contacting side (1 a), and applying a metal contacting layer (7) to form an electrically conductive connection between semiconductor substrate (1) and contacting layer (7) at the high-doping regions.

IPC 8 full level

H01L 31/0224 (2006.01)

CPC (source: EP US)

H01L 31/02168 (2013.01 - EP US); **H01L 31/022425** (2013.01 - EP US); **H01L 31/061** (2013.01 - EP US); **H01L 31/1804** (2013.01 - EP US); H01L 21/268 (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 2011091959A2

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)

DE 102010006315 A1 20110804; **DE 102010006315 B4 20120830**; CN 102893404 A 20130123; CN 102893404 B 20151125; EP 2529405 A2 20121205; MY 157451 A 20160615; SG 182762 A1 20120830; US 2012301995 A1 20121129; US 8900908 B2 20141202; WO 2011091959 A2 20110804; WO 2011091959 A3 20120705; WO 2011091959 A8 20120907

DOCDB simple family (application)

DE 102010006315 A 20100129; CN 201180007543 A 20110118; EP 11701006 A 20110118; EP 2011000180 W 20110118; MY PI2012003368 A 20110118; SG 2012055737 A 20110118; US 201113575446 A 20110118