

## Title (en)

LASER PROCESSING FOR HIGH-EFFICIENCY THIN CRYSTALLINE SILICON SOLAR CELL FABRICATION

## Title (de)

LASERVERARBEITUNG ZUR HERSTELLUNG HOCHEFFIZIENTER DÜNNER SILICIUMKRISTALL-SOLARZELLEN

## Title (fr)

TRAITEMENT LASER POUR FABRICATION DE CELLULES SOLAIRES EN SILICIUM CRISTALLIN MINCE À EFFICACITÉ ÉLEVÉE

## Publication

**EP 2577750 A4 20140409 (EN)**

## Application

**EP 11787543 A 20110527**

## Priority

- US 201113057104 A 20110201
- US 34912010 P 20100527
- US 2011038444 W 20110527

## Abstract (en)

[origin: WO2011150397A2] Laser processing schemes are disclosed for producing various types of hetero-junction and homo-junction solar cells. The methods include base and emitter contact opening, selective doping, and metal ablation. Also, laser processing schemes are disclosed that are suitable for selective amorphous silicon ablation and selective doping for hetero-junction solar cells. These laser processing techniques may be applied to semiconductor substrates, including crystalline silicon substrates, and further including crystalline silicon substrates which are manufactured either through wire saw wafering methods or via epitaxial deposition processes, that are either planar or textured/three-dimensional. These techniques are highly suited to thin crystalline semiconductor, including thin crystalline silicon films.

## IPC 8 full level

**H01L 31/18** (2006.01); **B23K 26/06** (2014.01); **B23K 26/08** (2014.01); **B23K 26/38** (2014.01); **B23K 26/40** (2014.01); **H01L 31/0224** (2006.01); **H01L 31/0392** (2006.01); **H01L 31/042** (2014.01); **H01L 31/068** (2012.01)

## CPC (source: EP KR)

**B23K 26/0624** (2015.10 - EP); **B23K 26/08** (2013.01 - EP); **B23K 26/389** (2015.10 - EP); **B23K 26/40** (2013.01 - EP); **H01L 31/0445** (2014.12 - KR); **H01L 31/0682** (2013.01 - EP); **H01L 31/18** (2013.01 - KR); **H01L 31/182** (2013.01 - EP); **B23K 2101/36** (2018.07 - EP); **B23K 2103/172** (2018.07 - EP); **B23K 2103/40** (2018.07 - EP); **B23K 2103/50** (2018.07 - EP); **Y02E 10/546** (2013.01 - EP); **Y02E 10/547** (2013.01 - EP); **Y02P 70/50** (2015.11 - EP)

## Citation (search report)

- [XP] WO 2010135153 A2 20101125 - NANOGRAM CORP [US], et al
- [IY] US 2008202576 A1 20080828 - HIESLMAIR HENRY [US]
- [Y] US 5348589 A 19940920 - ARAI YASUYUKI [JP], et al
- [Y] US 2004261834 A1 20041230 - BASORE PAUL A [AU], et al
- [Y] US 2006088984 A1 20060427 - LI ERIC J [US], et al
- [A] SONJA HERMANN ET AL: "Picosecond laser ablation of SiO<sub>2</sub> layers on silicon substrates", APPLIED PHYSICS A; MATERIALS SCIENCE & PROCESSING, SPRINGER, BERLIN, DE, vol. 99, no. 1, 7 November 2009 (2009-11-07), pages 151 - 158, XP019801369, ISSN: 1432-0630
- See references of WO 2011150397A2

## 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 2011150397 A2 20111201**; **WO 2011150397 A3 20120405**; EP 2577750 A2 20130410; EP 2577750 A4 20140409; KR 101289787 B1 20130726; KR 20130027535 A 20130315

## DOCDB simple family (application)

**US 2011038444 W 20110527**; EP 11787543 A 20110527; KR 20127033876 A 20110527