

Title (en)

IN-SITU RAPID ANNEALING AND OPERATION OF SOLAR CELLS FOR EXTREME ENVIRONMENT APPLICATIONS

Title (de)

SCHNELLES IN-SITU-TEMPERN UND BETRIEB VON SOLARZELLEN FÜR EXTREME UMGEBUNGSANWENDUNGEN

Title (fr)

RECUIT RAPIDE IN-SITU ET FONCTIONNEMENT DE CELLULES SOLAIRES POUR APPLICATIONS EN ENVIRONNEMENT EXTRÊME

Publication

**EP 4052305 A4 20231115 (EN)**

Application

**EP 20882338 A 20201030**

Priority

- US 201962928277 P 20191030
- US 2020058317 W 20201030

Abstract (en)

[origin: WO2021087331A1] Method and apparatus for annealing micro-scale or macro solar cells that can contain lithium or hydrogen. Heaters, a current that is applied in forward or reverse direction, or open-circuiting the cells are used optionally with a laser or other light source to increase the temperature of the cells to perform periodic anneals to recover energy conversion efficiency lost due to environmental conditions such as radiation damage and maintain desired operational conditions. Larger amounts of additional energy are harvested with the improved efficiency of the cells. Illuminating the cells with specific wavelengths of light can enhance the diffusion of the lithium or hydrogen, or their binding and unbinding from dopants or defects, in the silicon lattice. The lithium or hydrogen can diffuse into the cells via their inclusion in the polysilicon layer forming a tunneling oxide passivated contact. Dopants in the silicon can reduce annealing time and temperature.

IPC 8 full level

**H01L 31/041** (2014.01); **B64G 1/44** (2006.01); **H01L 31/0288** (2006.01); **H01L 31/068** (2012.01); **H01L 31/0745** (2012.01); **H01L 31/078** (2012.01); **H01L 31/18** (2006.01); **H02S 40/40** (2014.01)

CPC (source: EP)

**B64G 1/443** (2013.01); **H01L 31/0288** (2013.01); **H01L 31/041** (2014.12); **H01L 31/0682** (2013.01); **H01L 31/0745** (2013.01); **H01L 31/078** (2013.01); **H01L 31/182** (2013.01); **H01L 31/186** (2013.01); **H01L 31/1864** (2013.01); **H10N 10/13** (2023.02); **Y02E 10/546** (2013.01); **Y02P 70/50** (2015.11)

Citation (search report)

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- [X] KR 20180095413 A 20180827 - LG ELECTRONICS INC [KR]
- [X] STATLER R. L.: "Radiation damage and annealing of lithium-doped silicon solar cells", JPL PROC. OF THE FOURTH ANN. CONF. ON EFFECTS OF LITHIUM DOPING ON SILICON SOLAR CELLS, 15 September 1971 (1971-09-15), pages 91 - 98, XP093089191
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CN117275634A

Designated contracting state (EPC)

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