

Title (en)

RE-CRYSTALLIZATION OF SEMICONDUCTOR SURFACE FILM AND DOPING OF SEMICONDUCTOR BY ENERGETIC CLUSTER IRRADIATION

Title (de)

REKRISTALLISIERUNG EINES HALBLEITEROBERFLÄCHENFILMS UND HALBLEITERDOTIERUNG MITTELS ENERGETISCHER CLUSTERBESTRAHLUNG

Title (fr)

RECRISTALLISATION DE FILMS SUPERFICIELS DE SEMI-CONDUCTEURS PAR IRRADIATION ENERGETIQUE D'AMAS

Publication

EP 1584104 A4 20100526 (EN)

Application

EP 03799903 A 20031212

Priority

- US 0339754 W 20031212
- US 43386602 P 20021212

Abstract (en)

[origin: WO2004053945A2] Method of gas-cluster ion beam 128 processing of damaged semiconductor films 308 for re-crystallization and/or for activating a dopant in a semiconductor film 308 with reduced dopant diffusion, and semiconductor devices formed using the method. The method is useful, for example, for restoring crystallinity and/or for electrically activating a dopant species after shallow dopant ion implantation for forming shallow junctions. In one embodiment of the method, dopant atoms incorporated into the gas-clusters produces shallow doping of a semiconductor 302 with simultaneous electrical activation of the dopant atoms and re-crystallization of the semiconductor.

IPC 8 full level

H01L 21/425 (2006.01); **H01J 37/317** (2006.01); **H01L 21/20** (2006.01); **H01L 21/26** (2006.01); **H01L 21/263** (2006.01); **H01L 21/265** (2006.01); **H01L 21/302** (2006.01); **H01L 21/324** (2006.01); **H01L 21/44** (2006.01)

CPC (source: EP US)

H01J 37/317 (2013.01 - EP); **H01L 21/02667** (2013.01 - US); **H01L 21/2636** (2013.01 - EP); **H01J 2237/0812** (2013.01 - EP)

Citation (search report)

- [XII] US 4370176 A 19830125 - BRUEL MICHEL [FR]
- [XI] JP S56115527 A 19810910 - CHO LSI GIJUTSU KENKYU KUMIAI
- [A] WO 02052608 A2 20020704 - EPION CORP [US] & JOURNAL OF ELECTRONIC MATERIALS, WARRENDALE, PA, US, vol. 32, no. 8, 1 August 2003 (2003-08-01), pages 842 - 848, XP009132285, ISSN: 0361-5235
- [XOI] ALLEM L P ET AL: "Gas-cluster ion-beam smoothing of chemo-mechanical-polish processed GaSb(100) substrates", THIRD INTERNATIONAL CONFERENCE ON ALTERNATIVE SUBSTRATE TECHNOLOGY, September 2002 (2002-09-01), Cancun, Mexico
- [A] YAMADA I ET AL: "Materials processing by gas cluster ion beams", MATERIALS SCIENCE AND ENGINEERING R: REPORTS, ELSEVIER SEQUOIA S.A., LAUSANNE, CH LNKD- DOI:10.1016/S0927-796X(01)00034-1, vol. 34, no. 6, 30 October 2001 (2001-10-30), pages 231 - 295, XP004308527, ISSN: 0927-796X
- See references of WO 2004053945A2

Designated contracting state (EPC)

DE FR GB

DOCDB simple family (publication)

WO 2004053945 A2 20040624; **WO 2004053945 A3 20050303**; AU 2003299614 A1 20040630; AU 2003299614 A8 20040630; EP 1584104 A2 20051012; EP 1584104 A4 20100526; JP 2006510196 A 20060323

DOCDB simple family (application)

US 0339754 W 20031212; AU 2003299614 A 20031212; EP 03799903 A 20031212; JP 2004558211 A 20031212