(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 December 2012 (13.12.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/170994 A3

(51) International Patent Classification:
H01L 33/00 (2010.01)

(21) International Application Number:
PCT/US2012/041872

(22) International Filing Date:
11 June 2012 (11.06.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/495,829 10 June 2011 (10.06.2011) US

(71) Applicant *(for all designated States except US)*: **THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** [US/US]; 1111 Franklin Street, 12th Floor, Oakland, California 94607 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **NAKAMURA, Shuji** [US/US]; P.O. Box 61656, Santa Barbara, California 93160 (US). **DENBAARS, Steven P.** [US/US]; 283 Elderberry Drive, Goleta, California 93117 (US). **TANAKA, Shinichi** [JP/US]; 473 Harvard Lane, Santa Barbara, California 93111 (US). **FEEZELL, Daniel F.** [US/US]; 2715 Verde Vista Drive, Santa Barbara, California 93105 (US). **ZHAO, Yuji** [CN/US]; 731 Elkus Walk, Apt. 101, Goleta, California 93117 (US). **PAN, Chih-Chien** [—/US]; 762 Birch Walk, Apt. G, Goleta, California 93117 (US).

(74) Agent: **SERAPIGLIA, Gerard B.**; 6701 Center Drive West, Suite 1050, Los Angeles, CA 90045 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

(88) Date of publication of the international search report:
1 May 2014

(54) Title: LOW DROOP LIGHT EMITTING DIODE STRUCTURE ON GALLIUM NITRIDE SEMIPOLAR SUBSTRATES

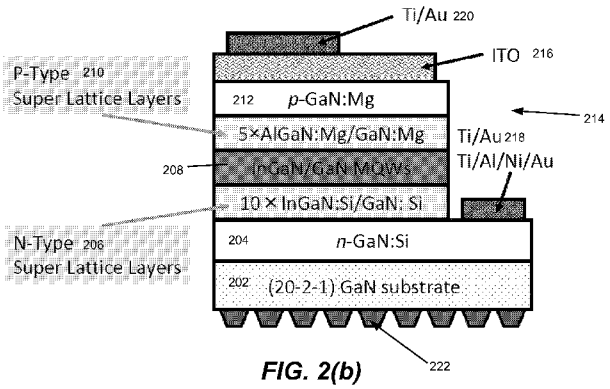


FIG. 2(b)

(57) Abstract: A light emitting diode structure of (Al,Ga,In)N thin films grown on a gallium nitride (GaN) semipolar substrate by metal organic chemical vapor deposition (MOCVD) that exhibits reduced droop. The device structure includes a quantum well (QW) active region of two or more periods, n-type superlattice layers (n-SLs) located below the QW active region, and p-type superlattice layers (p-SLs) above the QW active region. The present invention also encompasses a method of fabricating such a device.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 12/41872

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H01L 33/00 (2012.01)
USPC - 257/13
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01L 33/00 (2012.01)
257/13

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
H01L 33/00, 33/02, 33/04 (2012.01)
257/13, E33.013, E33.023

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Google Patents, Google Scholar, and Dialog: Opto-electronic, nitirde, light-emitting device, external quantum efficiency, droop, EQE, LED, quantum well, quantum barrier, multi-quantum well, Silicon, Si, SiO, ZnO, Zinc Oxide, Silicon Oxide

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0212277 A1 (Akita et al.) 27 August 2009 (27.08.2009); entire document, especially para. [0062], [0080], [0087], and [0100].	1-20
Y	US 2011/0064103 A1 (Ohta et al.) 17 March 2011 (17.03.2011); entire document, especially para. [0027], [0027], [0052]-[0053], [0057], [0071], and [0085]-[0089]	1-20
A	US 2011/0073888 A1 (Ueno et al.) 31 March 2011 (31.03.2011); entire document	1-20
A	US 2007/0093073 A1 (Farrell et al.) 26 April 2007 (26.04.2007); entire document	15-20
A	High Brightness InGaN Blue, Green and Yellow Light-Emitting Diodes with Quantum Well Structures (Nakamura et al.); Jpn. J. Appl. Phys. 34 (1995), pp. L797-L799.	1-20

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 August 2012 (17. 08.2012)	17 SEP 2012
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)