

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, *ML*, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, 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 4.1 7(iv))*

Published:

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

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) **Date of publication of the international search report:**

4 August 2011

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 10/46015

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H01L 21/00 (201 1.01)**USPC - 438/22**

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)

IPC(8): H01L 21/00 (201 1.01)

USPC: 438/22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

IPC(6): H01L 21/00 (2011.01)

USPC: 257/9, 12, E21 .017; 372/39, 43.01, 66, 109; 438/22, 38, 39, 40

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST; PGPB, USPT, EPAB, JPAB; Google Scholar; Google Patent; Search Terms: gallium nitride GaN aluminum boron Al-GaN laser diode VCSEL LED OLED etch stop pattern mask selective doped n-type p-type electrode via contact aperture hole

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0278622 A1 (Lester et al.) 06 December 2007 (06.12.2007) para. [0001] through [0029], Fig. 1-4	1, 2, 4, 5, 8, 9, 14, 15, 18
Y		3, 6, 7, 10-13, 16, 17
Y	US 2002/01 17681 A1 (Weeks et al.) 29 August 2002 (29.08.2002) para. [0002] through [0057], Fig. 1-4	3, 6, 7, 10-13, 16, 17
A	US 2004/0042517 A1 (Steinle et al.) 04 March 2004 (04.03.2004) entire document	1-18
A	US 2004/0130002 A1 (Weeks et al.) 08 July 2004 (08.07.2004) entire document	1-18
A	US 2006/0186422 A1 (Gaska et al.) 24 August 2006 (24.08.2006) entire document	1-18
A	US 2006/0246722 A1 (Speck et al.) 02 November 2006 (02.11.2006) entire document	1-18



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

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"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

25 April 2011 (25.04.2011)

Date of mailing of the international search report

26 MAY 2011

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**