

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 September 2007 (13.09.2007)

PCT

(10) International Publication Number
WO 2007/103566 A3

(51) International Patent Classification:
G01L 1/24 (2006.01) *G01B 11/02* (2006.01)

(21) International Application Number:
PCT/US2007/006085

(22) International Filing Date: 9 March 2007 (09.03.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/781,218 9 March 2006 (09.03.2006) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
14 August 2008



WO 2007/103566 A3

(54) Title: DETERMINATION OF LITHOGRAPHY MISALIGNMENT BASED ON CURVATURE AND STRESS MAPPING DATA OF SUBSTRATES

(57) Abstract: Provided are methods to be carried out prior to, while, and/or after performing a photolithographic process to a wafer that involve wafer misalignment assessment. The method involves obtaining curvature and/or deformation information of a surface of the wafer over a plurality of locations so as to obtain a curvature map of the wafer. The curvature map is processed to obtain a stress map of the wafer. The stress map is used to determine displacement of a layer of the wafer. The displacement information is used to determine a degree of misalignment in the photolithographic process.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/06085

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **G01L 1/24**(2006.01);**G01B 11/02**(2006.01)

USPC: 356/35.5,508,511

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)

U.S. : 356/ 35.5, 508, 511-514, 489, 490, 495, 509

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

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

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004/0257,587 A1 (ROSAKIS et al) 23 December 2004 (23.12.2004), see entire document	1-31
A	US 6,781,702 B2 (GIANNAKOPOULOS et al) 24 August 2004 (24.08.2004), see entire document	1-31

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

04 June 2008 (04.06.2008)

Date of mailing of the international search report

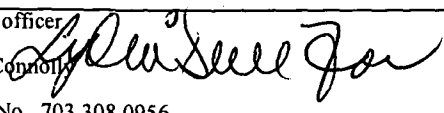
18 JUN 2008

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/06085

Continuation of B. FIELDS SEARCHED Item 3:

EAST (USPAT, USPG_PUB, EPO, JPO, IBM_TDB)

search terms: curvature, stress, strain, distance, position, displacement, wafer, layer, substrate, film, alignment, misalignment