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(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, 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, 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 (patent), UZ, VC, VN, ZA, ZM, ZW.

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[Continued on next page]

(54) Title: METHOD FOR FORMING A METAL SILIICIDE

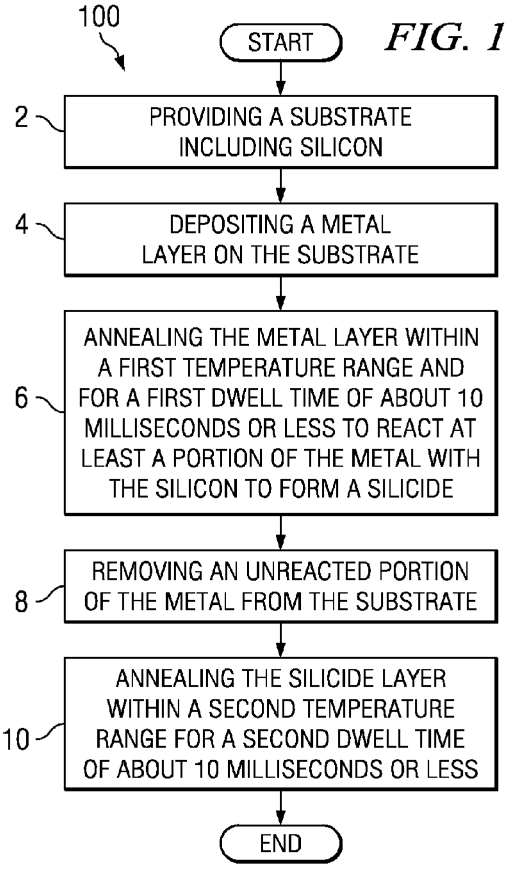

FIG. 1

(57) Abstract: The present application is directed to a method for forming a metal suicide layer. The method comprises providing a substrate (2) comprising silicon and depositing a metal layer on the substrate (4). The metal layer is annealed within a first temperature range and for a first dwell time of about 10 milliseconds or less to react at least a portion of the metal with the silicon (6). An unreacted portion of the metal is removed from the substrate (8). The metal layer is annealed within a second temperature range for a second dwell time of about 10 milliseconds or less to react at least a portion of the metal with the silicon (10).

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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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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:
19 February 2009

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/068073

A. CLASSIFICATION OF SUBJECT MATTER

H01L 21/28(2006.01)i

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 21/28, H01L 21/336, H01L 21/8238

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

Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

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

e-KIPASS(KIPO internal) : "silicide", "annealing", "millisecond"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005-0070082 A1 (THORSTEN KAMMLER et al.) 31 MARCH 2005 See the abstract, paragraphs [0036]-[0038], claims 1-26, figures 2(a)-2(d)	1-4, 6-10
Y	H. Kiyama, 'Flash Lamp Annealing Latest Techonology for 45nm device and Future devices.' In: Advanced Thermal Proceeding of Semiconductors, 2006, RTP '06, 14th IEEE International Conference, ISBN 1-4244-0648-X, pp. 65-71(October 2006) See the abstract, pages 68-71	1-4, 6-10
Y	JP 11-233456 A (TEXAS INSTRUMENTS INC.) 27 AUGUST 1999 See the abstract, paragraphs [0009]-[0012], figure 1	1-2, 4, 6-10
Y	US 2007-0138578 A1 (ALESSANDRO C. CALLEGARI et al.) 21 JUNE 2007 See the abstract, paragraphs [0054]-[0057]	1-2, 4, 6, 8-9
Y	KR 10-0555541 B1 (SAMSUNG ELECTRONICS CO., LTD.) 03. MARCH 2006 See the abstract, Pages 4-5, figures 1-2	1-2, 4, 6, 8-9
A	US 2007-0141798 A1 (MARK T. BOHR) 21 JUNE 2007 See the abstract, paragraphs [0013] and [0038]	1-4, 6-10

☐ 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
"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 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 23 DECEMBER 2008 (23.12.2008)	Date of mailing of the international search report **23 DECEMBER 2008 (23.12.2008)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer KIM, Sang Keol Telephone No. 82-42-481-5742

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/068073

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 5
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

Claim 5 does not exist in the international application.

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required addtional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2008/068073

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