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[Continued on next page]

(54) Title: A SEMICONDUCTOR DEVICE COMPRISING A METAL GATE STACK OF REDUCED HEIGHT AND METHOD OF FORMING THE SAME

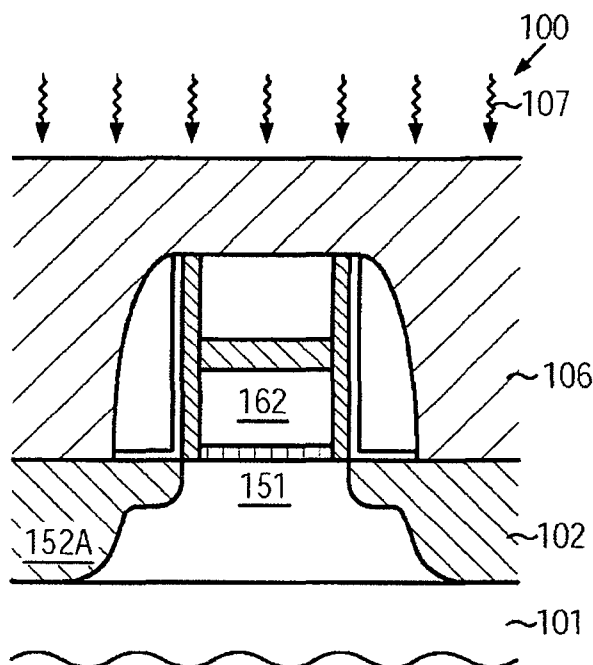


FIG. 1f

(57) Abstract: By providing a CMP stop layer in a metal gate stack (160), the initial height thereof may be efficiently reduced after the definition of the deep drain and source areas (152), thereby providing enhanced process conditions for forming highly stressed dielectric materials. Consequently, the dielectric material (161) may be positioned more closely to the channel region substantially without deteriorating gate conductivity.

WO 2009/108366 A3

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. H01L21/336 H01L21/8238

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

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/050863 A1 (HENSON WILLIAM K [US] ET AL) 28 February 2008 (2008-02-28) paragraph [0025] - paragraph [0030] paragraphs [0036], [0038]; figures 2,7 paragraph [0041] - paragraph [0043]	1-3,7,8
X	US 2007/132038 A1 (CHONG YUNG F [SG] ET AL) 14 June 2007 (2007-06-14) paragraph [0021] - paragraph [0034] paragraph [0053] paragraph [0075] - paragraph [0076]	1-3,5-8
Y	JP 02 162738 A (NIPPON ELECTRIC CO) 22 June 1990 (1990-06-22) the whole document	1-8
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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 document 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

28 May 2009

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>HORSTMANN M ET AL: "Integration and optimization of embedded-sige, compressive and tensile stressed liner films, and stress memorization in advanced SOI CMOS technologies" INTERNATIONAL ELECTRON DEVICES MEETING 5-7.12.2005, IEEE, PISCATAWAY, NJ: USA, 5 December 2005 (2005-12-05), pages 233-236, XP010903446 ISBN: 978-0-7803-9268-7 the whole document</p>	1-8
Y	<p>US 2003/146458 A1 (HORIUCHI MASATADA [JP] ET AL) 7 August 2003 (2003-08-07) paragraphs [0043], [0069]</p>	1-8
A	<p>JP 08 125175 A (MITSUBISHI ELECTRIC CORP) 17 May 1996 (1996-05-17) the whole document</p>	1
A	<p>US 2006/148181 A1 (CHAN BOR-WEN [TW] ET AL) 6 July 2006 (2006-07-06) the whole document</p>	1
A	<p>US 2005/145894 A1 (CHAU ROBERT S [US] ET AL) 7 July 2005 (2005-07-07) paragraph [0030] - paragraph [0033]; figures 4,5</p>	5
P,A	<p>US 2008/102634 A1 (PAS MICHAEL FRANCIS [US] ET AL) 1 May 2008 (2008-05-01) the whole document</p>	1-8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/001283

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.:
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:

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:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

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

3. As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers 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.:

1-8

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8

Method of forming a strained transistor using a mask material and CMP (claims 4, 5)

2. claims: 9-16

Method of forming strained complementary transistors (claim 9)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/001283

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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