

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P89503PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2015/000373	International filing date (<i>day/month/year</i>) 26 December 2015 (26.12.2015)	(Earliest) Priority Date (<i>day/month/year</i>)
Applicant INTEL CORPORATION		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

the international application in the language in which it was filed

a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the **drawings** to be published with the abstract is Figure No. 4

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b. none of the figures is to be published with the abstract.

A. CLASSIFICATION OF SUBJECT MATTER**H01L 29/78(2006.01)i, H01L 21/336(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
H01L 29/78; H01L 21/84; H01L 21/762; H01L 29/66; H01L 27/092; H01L 27/12; H01L 21/336Documentation 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
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & keywords: fins, interlayer dielectric, axis, cap, recess, 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 2012-0012935 A1 (AKIO KANEKO et al.) 19 January 2012 See abstract, paragraphs [0048]-[0069] and figures 5-19.	1-4
A		5-23
Y	US 2014-0203376 A1 (GLOBALFOUNDRIES INC.) 24 July 2014 See abstract, paragraphs [0006],[0021]-[0025] and figures 1-15.	1-4
A	US 2015-0179770 A1 (UNITED MICROELECTRONICS CORP.) 25 June 2015 See abstract, paragraphs [0033]-[0039] and figures 6-10.	1-23
A	US 2012-0205742 A1 (SUBRAMANIAN S. IYER et al.) 16 August 2012 See abstract, claims 1-9 and figures 8A-12.	1-23
A	US 8981481 B2 (WALID M. HAFEZ et al.) 17 March 2015 See abstract, column 3, line 40-column 4, line 50 and figures 1-4F.	1-23

 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 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

24 August 2016 (24.08.2016)

Date of mailing of the international search report

24 August 2016 (24.08.2016)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2015/000373

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2012-0012935 A1	19/01/2012	JP 2007-207837 A US 2007-0190708 A1 US 2010-0304555 A1 US 7795682 B2 US 8053292 B2 US 8338889 B2	16/08/2007 16/08/2007 02/12/2010 14/09/2010 08/11/2011 25/12/2012
US 2014-0203376 A1	24/07/2014	US 9070742 B2	30/06/2015
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US 2012-0205742 A1	16/08/2012	US 2011-204443 A1 US 8227304 B2 US 8350269 B2	25/08/2011 24/07/2012 08/01/2013
US 8981481 B2	17/03/2015	TW 201413920 A US 2014-0001569 A1 US 2015-179525 A1 US 2016-111449 A1 WO 2014-004012 A2 WO 2014-004012 A3	01/04/2014 02/01/2014 25/06/2015 21/04/2016 03/01/2014 20/02/2014