

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 90115796	<b>FOR FURTHER ACTION</b>	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. <b>PCT/US2016/014969</b>	International filing date ( <i>day/month/year</i> ) <b>26 January 2016 (26.01.2016)</b>	(Earliest) Priority Date ( <i>day/month/year</i> )
Applicant <b>HEWLETT PACKARD ENTERPRISE DEVELOPMENT LP</b>		

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. 2A

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 45/00(2006.01)i, H01L 45/02(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)

H01L 45/00; H01L 23/52; H01L 27/115; H01L 23/528; H01L 21/8247; G11C 29/00; G11C 13/00; G11C 11/00; H01L 21/8239; H01L 45/02

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

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords:threshold switch, selector, resistive memory, amorphous, electrode

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 9177916 B1 (INTERMOLECULAR, INC.) 03 November 2015 See column 1, line 38 - column 7, line 44, column 13, line 4 - column 15, line 13 and figures 1A-5B.	1-15
Y	US 2003-0227803 A1 (EIJI NATORI et al.) 11 December 2003 See paragraphs [0041]-[0049], claims 1-6 and figure 4.	1-15
A	KR 10-2013-0011600 A (GWANGJU INSTITUTE OF SCIENCE AND TECHNOLOGY et al.) 30 January 2013 See paragraphs [0042]-[0053], claims 1, 2 and figure 7.	1-15
A	US 2014-0268992 A1 (MICRON TECHNOLOGY, INC.) 18 September 2014 See paragraphs [0055]-[0067], claim 1 and figures 3-4B.	1-15
A	US 2012-0113706 A1 (R. STANLEY WILLIAMS et al.) 10 May 2012 See paragraphs [0028]-[0032], claim 1 and figure 1.	1-15

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

26 October 2016 (26.10.2016)

Date of mailing of the international search report

**26 October 2016 (26.10.2016)**

Name and mailing address of the ISA/KR

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2016/014969**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 9177916 B1	03/11/2015	None	
US 2003-0227803 A1	11/12/2003	CN 1484858 A CN 1484858 C JP 4051567 B2 US 6922351 B2 WO 03-023858 A1	24/03/2004 09/08/2006 27/02/2008 26/07/2005 20/03/2003
KR 10-2013-0011600 A	30/01/2013	KR 10-1257365 B1 US 2013-0021835 A1 US 2015-0318041 A1 US 2015-0318474 A1 US 9117513 B2 US 9208869 B2 US 9214631 B2	23/04/2013 24/01/2013 05/11/2015 05/11/2015 25/08/2015 08/12/2015 15/12/2015
US 2014-0268992 A1	18/09/2014	US 9293196 B2	22/03/2016
US 2012-0113706 A1	10/05/2012	CA 02767764 A1 CN 102482276 A CN 102484127 A CN 102484127 B EP 2443657 A1 EP 2443657 A4 EP 2455380 A1 KR 10-2012-0046327 A US 2012-0142672 A1 US 8891284 B2 WO 2011-007756 A1 WO 2011-028208 A1	20/01/2011 30/05/2012 30/05/2012 15/07/2015 25/04/2012 31/07/2013 23/05/2012 09/05/2012 07/06/2012 18/11/2014 20/01/2011 10/03/2011