

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P158WO88231	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2018/043311	International filing date (<i>day/month/year</i>) 23 July 2018 (23.07.2018)	(Earliest) Priority Date (<i>day/month/year</i>) 07 August 2017 (07.08.2017)
Applicant MICRON TECHNOLOGY, INC.		

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. 5

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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/043311**A. CLASSIFICATION OF SUBJECT MATTER****G11C 11/56(2006.01)i, G11C 5/02(2006.01)i, G11C 5/04(2006.01)i, G11C 7/10(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)

G11C 11/56; G11C 7/00; G11C 8/00; H04B 3/04; H04L 12/931; H04L 12/935; H04L 25/34; G11C 5/02; G11C 5/04; G11C 7/10

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) & Keywords: array, memory cells, controller, interposer, channel, receiver, decode, multi-level signal, modulation, comparator, bits, voltage, threshold, pulse-amplitude modulation (PAM), material, silicon

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	NADEESHA AMARASINGHE, `A Single-ended Simultaneously Bidirectional Transceiver for Ultra-short Reach Die to Die Links`, Master of Applied Science Graduate Department of Electrical and Computer Engineering University of Toronto, pp. 1-70, 2016. Retrieved from the Internet: <https://tspace.library.utoronto.ca/bitstream/1807/74501/3/Amarasinghe_Nadeesha_201611_MAS_thesis.pdf> See pages 2-3, 5, 38, 56; and figure 1.2.	1-21
Y	US 8781022 B1 (AU OPTRONICS CORPORATION) 15 July 2014 See column 1, lines 6-30; column 9, lines 50-66; column 14, lines 42-46; claim 1; and figures 3-4, 8.	1-21
A	US 2014-0226734 A1 (KANDOU LABS, S.A.) 14 August 2014 See paragraphs [0035]-[0037]; and figure 10.	1-21
A	US 2008-0144411 A1 (ELY TSERN) 19 June 2008 See paragraphs [0071]-[0075]; and figures 11-15.	1-21
A	US 2017-0054656 A1 (MEDIATEK INC.) 23 February 2017 See paragraph [0016]; and figure 2.	1-21

 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

31 October 2018 (31.10.2018)

Date of mailing of the international search report

31 October 2018 (31.10.2018)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2018/043311

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8781022 B1	15/07/2014	CN 103391092 A	13/11/2013
		CN 103391092 B	21/10/2015
		EP 2962472 A1	06/01/2016
		EP 2962472 A4	04/01/2017
		EP 2962472 B1	22/08/2018
		TW 201436541 A	16/09/2014
		TW 1530167 B	11/04/2016
		WO 2014-131261 A1	04/09/2014
US 2014-0226734 A1	14/08/2014	CN 105122758 A	02/12/2015
		CN 105122758 B	10/07/2018
		US 2015-0349835 A1	03/12/2015
		US 2016-0285456 A1	29/09/2016
		US 9106220 B2	11/08/2015
		US 9362974 B2	07/06/2016
		US 9838017 B2	05/12/2017
		WO 2014-124450 A1	14/08/2014
US 2008-0144411 A1	19/06/2008	CN 101310338 A	19/11/2008
		CN 101887743 A	17/11/2010
		CN 101887743 B	20/02/2013
		EP 1929479 A2	11/06/2008
		JP 2009-510562 A	12/03/2009
		US 2007-0070669 A1	29/03/2007
		US 2007-0088995 A1	19/04/2007
		US 7464225 B2	09/12/2008
		US 7729151 B2	01/06/2010
		WO 2007-038225 A2	05/04/2007
WO 2007-038225 A3	14/06/2007		
US 2017-0054656 A1	23/02/2017	CN 106469720 A	01/03/2017
		EP 3136436 A1	01/03/2017