

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|---|---|---|
| Applicant's or agent's file reference P292WO1541 | FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below. | |
| International application No. PCT/US2019/063389 | International filing date (<i>day/month/year</i>) 26 November 2019 (26.11.2019) | (Earliest) Priority Date (<i>day/month/year</i>) 06 December 2018 (06.12.2018) |
| 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.

A. CLASSIFICATION OF SUBJECT MATTER**G06F 11/10(2006.01)i, G11C 29/52(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)
G06F 11/10; G06F 12/02; G11B 20/18; H03M 13/00; H03M 13/05; G11C 29/52Documentation 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: error correction code (ECC), redundant data plane, redundant ECC circuit, syndrome bit, bitwise operation**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| A | US 2015-0286529 A1 (MICRON TECHNOLOGY, INC.) 08 October 2015 paragraph [0016]; and claims 1, 7 | 1-24 |
| A | US 2010-0223532 A1 (SANG BEOM KANG et al.) 02 September 2010 claims 1, 3 | 1-24 |
| A | US 2018-0151197 A1 (SK HYNIX INC.) 31 May 2018 claim 1 | 1-24 |
| A | KR 10-2018-0059149 A (SK HYNIX INC.) 04 June 2018 claims 1, 5-6, 10 | 1-24 |
| A | US 2014-0359398 A1 (SANDISK TECHNOLOGIES INC.) 04 December 2014 claims 1, 7-9 | 1-24 |
| A | US 2011-0271164 A1 (BYOUNG-YOUNG AHN et al.) 03 November 2011 claims 1, 3 | 1-24 |

 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

"D" document cited by the applicant in the international application

"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

19 March 2020 (19.03.2020)

Date of mailing of the international search report

19 March 2020 (19.03.2020)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2019/063389

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|--|------------------|---|--|
| US 2015-0286529 A1 | 08/10/2015 | CN 106463158 A EP 3129985 A1 JP 2017-514263 A KR 10-2016-0143744 A TW 201603041 A WO 2015-157251 A1 | 22/02/2017 15/02/2017 01/06/2017 14/12/2016 16/01/2016 15/10/2015 |
| US 2010-0223532 A1 | 02/09/2010 | KR 10-2010-0098969 A US 8589767 B2 | 10/09/2010 19/11/2013 |
| US 2018-0151197 A1 | 31/05/2018 | KR 10-2018-0059150 A | 04/06/2018 |
| KR 10-2018-0059149 A | 04/06/2018 | None | |
| US 2014-0359398 A1 | 04/12/2014 | CN 105122372 A CN 105122372 B KR 10-2016-0026842 A TW 201503138 A TW I625728 B US 2014-0359400 A1 US 9092363 B2 US 9183086 B2 WO 2014-197144 A1 | 02/12/2015 05/07/2019 09/03/2016 16/01/2015 01/06/2018 04/12/2014 28/07/2015 10/11/2015 11/12/2014 |
| US 2011-0271164 A1 | 03/11/2011 | CN 102272855 A EP 2383750 A2 JP 2012-514266 A KR 10-1042197 B1 KR 10-2010-0078568 A US 8738987 B2 WO 2010-076966 A2 WO 2010-076966 A3 | 07/12/2011 02/11/2011 21/06/2012 20/06/2011 08/07/2010 27/05/2014 08/07/2010 19/08/2010 |