

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 180343-PCT	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. <b>PCT/US2019/064454</b>	International filing date ( <i>day/month/year</i> ) <b>04 December 2019 (04.12.2019)</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) 06 December 2018 (06.12.2018)
Applicant <b>ADVANCED MICRO DEVICES, INC.</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. 1

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 17/16(2006.01)i, G06F 9/38(2006.01)i, G01T 1/20(2006.01)i, G06N 3/02(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)  
G06F 17/16; G06F 9/30; G06F 9/38; G06N 3/04; G06N 3/08; G06T 1/20; G01T 1/20; G06N 3/02Documentation 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:graphics processing unit (GPU), matrix multiplication, subset, partition, pipeline, series, concurrent**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2018-0189236 A1 (INTEL CORPORATION) 05 July 2018 paragraphs [0014], [0020], [0048], [0057], [0064], [0123]-[0127]; and figure 3	1-20
Y	US 2018-0315158 A1 (INTEL CORPORATION) 01 November 2018 claim 8; and figures 2C-2D	1-20
A	US 2018-0321938 A1 (NVIDIA CORPORATION) 08 November 2018 paragraphs [0050]-[0063], [0097]-[0108]; and figures 4, 9	1-20
A	US 2017-0161608 A1 (INTERNATIONAL BUSINESS MACHINES CORPORATION) 08 June 2017 paragraph [0044]	1-20
A	US 2017-0147531 A1 (INTERNATIONAL BUSINESS MACHINES CORPORATION) 25 May 2017 paragraphs [0083]-[0086]	1-20

 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

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

Date of the actual completion of the international search

26 March 2020 (26.03.2020)

Date of mailing of the international search report

**26 March 2020 (26.03.2020)**

Name and mailing address of the ISA/KR

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2019/064454**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2018-0189236 A1	05/07/2018	EP 3346392 A1 US 10169296 B2 US 2019-0138569 A1	11/07/2018 01/01/2019 09/05/2019
US 2018-0315158 A1	01/11/2018	CN 108805792 A EP 3396533 A2 EP 3396533 A3 US 10186011 B2 US 2019-0139182 A1	13/11/2018 31/10/2018 23/01/2019 22/01/2019 09/05/2019
US 2018-0321938 A1	08/11/2018	CN 108874744 A US 10338919 B2	23/11/2018 02/07/2019
US 2017-0161608 A1	08/06/2017	US 10262260 B2 US 2015-0161522 A1 US 9665823 B2	16/04/2019 11/06/2015 30/05/2017
US 2017-0147531 A1	25/05/2017	US 9558156 B1	31/01/2017