

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 10.2626.PCT	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2019/056029	International filing date (<i>day/month/year</i>) 14 October 2019 (14-10-2019)	(Earliest) Priority Date (<i>day/month/year</i>) 30 November 2018 (30-11-2018)
Applicant CIENA 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 4 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 43.6**bis**(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

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/056029

A. CLASSIFICATION OF SUBJECT MATTER
INV. H03L7/18 H03L7/22
ADD.
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)
H03L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/152757 A1 (SRIDHARAN KARTIK M [US]) 5 July 2007 (2007-07-05) paragraph [0045] - paragraph [0051]; figures 5-7	1-15
X	EP 1 397 772 A1 (ANALOG DEVICES INC [US]) 17 March 2004 (2004-03-17) paragraph [0076] - paragraph [0083]; figure 4	1,2, 5-10, 12-15
X	WO 2010/056813 A1 (ANALOG DEVICES INC [US]; PALMER WYN [US]; GENTILE KENNY [US]) 20 May 2010 (2010-05-20) page 2, line 19 - page 5, line 27; figures 1,2	1,2, 5-10, 12-15
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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 17 December 2019	Date of mailing of the international search report 03/01/2020
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Aouichi, Mohamed
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/056029

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8 493 111 B1 (BRADLEY DONALD ANTHONY [US]) 23 July 2013 (2013-07-23) column 3, line 40 - column 5, line 25; figure 3 -----	1,2, 7-10,14, 15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/056029

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2007152757	A1	05-07-2007	EP 1969725 A2	17-09-2008
			JP 5165585 B2	21-03-2013
			JP 2009522875 A	11-06-2009
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			US 2009146747 A1	11-06-2009
			US 2011133797 A1	09-06-2011
			WO 2007079098 A2	12-07-2007

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			CN 1465029 A	31-12-2003
			DE 60215806 T2	06-09-2007
			EP 1397772 A1	17-03-2004
			JP 2004522361 A	22-07-2004
			US 2003067405 A1	10-04-2003
			US 2005231408 A1	20-10-2005
			WO 02103609 A1	27-12-2002

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			WO 2010056813 A1	20-05-2010

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