

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/JP2018/043943

**A. CLASSIFICATION OF SUBJECT MATTER**

Int.Cl. H03F3/345 (2006.01) i, H03F1/22 (2006.01) i, H03F3/45 (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)

Int.Cl. H03F3/345, H03F1/22, H03F3/45

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

|  |           |
|--|-----------|
| Published examined utility model applications of Japan   | 1922-1996 |
| Published unexamined utility model applications of Japan | 1971-2019 |
| Registered utility model specifications of Japan         | 1996-2019 |
| Published registered utility model applications of Japan | 1994-2019 |

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|-----------|--|-----------------------|
| Y<br>A    | HUANG, D. J., "A 24-GHz low power and high isolation active quasi-circulator", 2012 IEEE/MTT-S International Microwave Symposium Digest, 06 August 2012, pp. 1-3 | 1-4, 6<br>5           |
| Y<br>A    | JP 2009-273073 A (MITSUMI ELECTRIC CO., LTD.) 19 November 2009, paragraphs [0031], [0032], fig. 2 (Family: none)   | 1-4, 6<br>5           |

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  
07.02.2019

Date of mailing of the international search report  
19.02.2019

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|-----------|---|-----------------------|
| Y<br>A    | JP 5-191162 A (HITACHI, LTD.) 30 July 1993, paragraph [0027], fig. 4 & US 5285168 A, column 8, line 48 to column 9, line 5, fig. 4  | 1-4, 6<br>5           |
| Y<br>A    | RAZAVI, Behzad 著, 黒田忠広訳, アナログ CMOS 集積回路の設計 基礎編, 丸善, 30 March 2003, pp. 173, 174, (Design of analog CMOS integrated circuits, MARUZEN PUBLISHING CO., LTD.), non-official translation (Written by RAZAVI, B., translated by KURODA, Tadahiro, basic section) | 2-4, 6<br>5           |
| Y<br>A    | JP 2-18606 A (NEC IC MICROCOMPUT SYST LTD.) 22 January 1990, page 1, lower right column, line 13 to page 2, lower left column, line 18, page 3, upper left column, line 13 to lower right column, line 1, fig. 1 (Family: none)                             | 4, 6<br>5             |
| A         | JP 2005-123716 A (ASAHI KASEI MICRO SYST CO., LTD.) 12 May 2005, paragraphs [0036]-[0038], fig. 6 (Family: none)  | 5                     |
| A         | JP 2014-207524 A (MITSUBISHI ELECTRIC CORPORATION) 30 October 2014, paragraphs [0029]-[0031], fig. 7 (Family: none)   | 5                     |