CIRCUITS FOR REDUCING OUT-OF-BAND-MODULATED TRANSMITTER SELF-INTERFERENCE

Abstract: Circuits for reducing out-of-band-modulated transmitter self-interference are provided. In some embodiments, receivers are provided, the receivers comprising: a low noise amplifier (LNA) having an input, a first output, and a second output, wherein the LNA includes: a common source transistor having a gate coupled to an input signal, a drain coupled to the first output of the LNA, and a source coupled to ground; and a common gate transistor having a gate coupled to a transmitter replica signal, a source coupled to the gate of the common source transistor, and a drain coupled to the second output of the LNA.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H03F 1/26, H03F 3/193, H04B 1/10 (2015.01)
CPC - H03F 1/26, H03F 3/193, H03F 2200/294, H03F 2200/372, H04B 1/10

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)

IPC(8)- H03F1/26, H03F3/193, H04B1/10 (2015.01)
CPC-H03F1/26, H03F3/193, H03F2200/294, H03F2200/372, H03F2200/451, H04B1/10

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

IPC(8)- H03F1/26, H03F3/193, H04B1/10, H04B1/12 (2015.01); CPC-H03F1/26, H03F3/193, H03F2200/294, H03F2200/372, H03F2200/451, H04B1/10, H04B1/12, H04B1/525; USPC - 330/295,31 1; 455/283,284,296

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

PatBase, Proquest Dialog, Google Patents/Scholar, Search terms used: interference rf receiver transceiver noise amplifier first second output common source common gate transistor transmitter replica duplicate copy signal wave gate variable gain amplifier variable gain radio frequency trans-impedance amplifier phase rotator multiphase mixer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>US 8,138,835 B2 (ZENG et al.) 20 March 2012 (20.03.2012), Fig 2, abstract, col 1, ln 57-65, col 3, ln 38-Coll 4, ln 10</td>
<td>1-13</td>
</tr>
<tr>
<td>A</td>
<td>US 7,902,923 B2 (LI et al.) 08 March 2011 (08.03.2011 1), Fig 2, abstract, col 2, ln 18-57</td>
<td>1-13</td>
</tr>
<tr>
<td>A</td>
<td>US 8,410,856 B2 (KUO et al.) 02 April 2013 (02.04.2013), Fig 1-3, col 1, ln 26-47, col 5, ln 31-50</td>
<td>1-13</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

“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

“T” 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

“X” 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

“P” document member of the same patent family

Date of the actual completion of the international search
15 September 2015 (15.09.2015)

Date of mailing of the international search report
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