



(11)

EP 2 642 594 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
30.10.2013 Bulletin 2013/44

(51) Int Cl.:
H01Q 1/38 (2006.01) H01Q 15/00 (2006.01)

(43) Date of publication A2:
25.09.2013 Bulletin 2013/39

(21) Application number: **13001204.0**

(22) Date of filing: **11.03.2013**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **22.03.2012 US 201261614066 P**
30.08.2012 US 20121360098

(71) Applicant: **Broadcom Corporation**
Irvine, CA 92617 (US)

(72) Inventors:
• **Alexopoulos, Nicolaos**
Irvine, CA 92617 (US)
• **Grau Besoli, Alfred**
08024 Barcelona (ES)
• **Kyriazidou, Chrysoula**
14562 Kifisia (GR)

(74) Representative: **Jehle, Volker Armin**
Bosch Jehle Patentanwaltsgesellschaft mbH
Flüggengstrasse 13
80639 München (DE)

(54) **Programmable antenna having a programmable substrate**

(57) An antenna circuit includes a substrate, an antenna, and a projected artificial magnetic mirror (PAMM). The antenna is fabricated on the substrate and is posi-

tioned in a region of the substrate that has a high permittivity. The PAMM produces an artificial magnetic conductor at a distance above a surface of the substrate to facilitate a radiation pattern for the antenna.

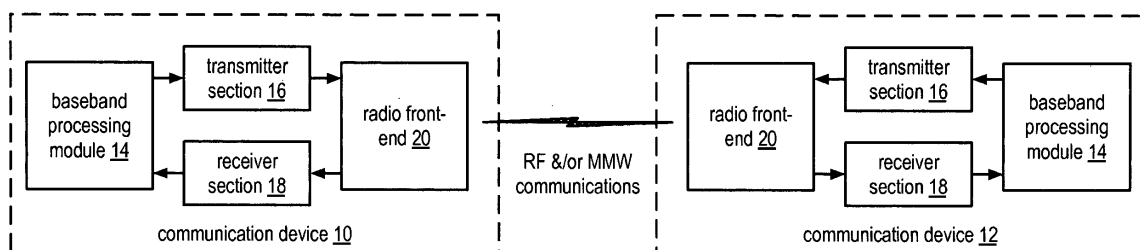


FIG. 1

EP 2 642 594 A3



EUROPEAN SEARCH REPORT

Application Number
EP 13 00 1204

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2010/116373 A1 (GALTRONICS CORP LTD [IL]; KRUPA STEVE [IL]; AZULAY SNIR [IL]) 14 October 2010 (2010-10-14)	1-3,6	INV. H01Q1/38 H01Q15/00
Y	* figure 1 * * page 6, line 7 - page 8, line 2 * -----	4,5,7,8	
X	US 2005/206574 A1 (OKAYAMA MOTOYUKI [JP]) 22 September 2005 (2005-09-22)	1-3,6	
Y	* figures 1,5 * * paragraphs [0018] - [0024] * * paragraphs [0026] - [0030] * -----	4,5,7,8	TECHNICAL FIELDS SEARCHED (IPC) H01Q
Y	EP 2 375 497 A2 (BROADCOM CORP [US]) 12 October 2011 (2011-10-12)	4,5,7,8	
	* figures 22,23,33-37 * * paragraphs [0064] - [0068] * * paragraphs [0083] - [0100] * -----		
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 June 2013	Examiner Unterberger, Michael
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

2
EPO FORM 1503 03.02 (P04C01)



Application Number

EP 13 00 1204

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- 1-8
- ☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 13 00 1204

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-8

A printed antenna circuit on a substrate with a region of high permeability and a region with high permittivity

2. claims: 9-15

An antenna circuit comprising a programmable frequency selective surface

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 00 1204

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-06-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010116373 A1	14-10-2010	US 2012044121 A1 WO 2010116373 A1	23-02-2012 14-10-2010

US 2005206574 A1	22-09-2005	NONE	

EP 2375497 A2	12-10-2011	CN 102255119 A EP 2375497 A2 TW 201212380 A US 8018375 B1 US 2011248180 A1 US 2011248798 A1 US 2011248897 A1 US 2011248901 A1 US 2011250838 A1	23-11-2011 12-10-2011 16-03-2012 13-09-2011 13-10-2011 13-10-2011 13-10-2011 13-10-2011 13-10-2011
