(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 March 2012 (08.03.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/030704 A3

(51) International Patent Classification:
G09G 3/20 (2006.01) *G06F 3/044* (2006.01)

(21) International Application Number:
PCT/US2011/049523

(22) International Filing Date:
29 August 2011 (29.08.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/870,844 29 August 2010 (29.08.2010) US

(71) Applicant *(for all designated States except US)*: **SILICON LABORATORIES INC.** [US/US]; 400 West Cesar Chavez, Austin, Texas 78701 (US).

(72) Inventor: **WELLAND, David**; 112 W. 32nd, Austin, Texas 78705 (US).

(74) Agent: **PETERSON, Maximilian**; P.O. Box 93005, Austin, Texas 78709-3005 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

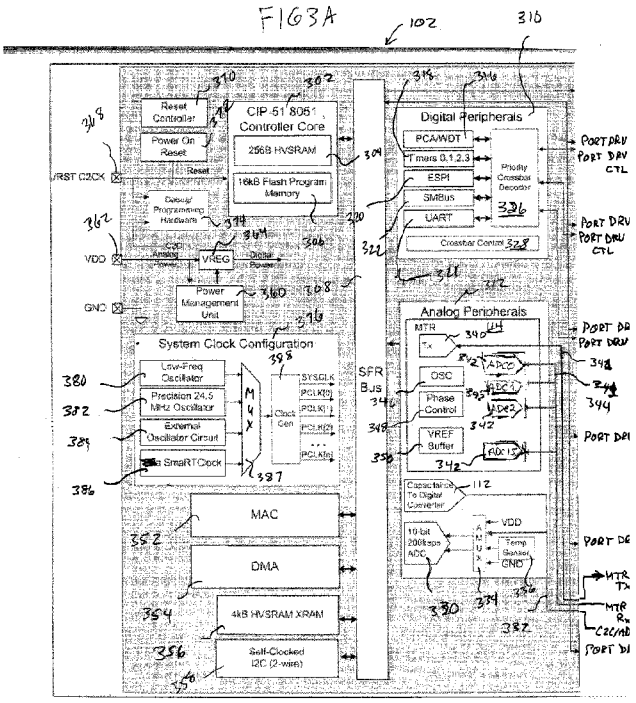
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

[Continued on next page]

(54) Title: MULTI-TOUCH RESOLVE MUTUAL CAPACITANCE SENSOR



(57) Abstract: A method for interfacing with a capacitive touch screen is disclosed. The method includes charging an internal capacitor in the touch screen, which internal capacitor is disposed proximate a fixed location on the touch screen and is capable of changing in response to a touch at the specific location. After charging, the charge on the internal capacitor is transferred from the touch screen and the value of the charge on the internal capacitor then determined.

WO 2012/030704 A3

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
31 May 2012

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/049523

A. CLASSIFICATION OF SUBJECT MATTER

G09G 3/20(2006.01)i, G06F 3/044(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)
G09G 3/20; G09G 3/30; G09G 5/00

Documentation 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 models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: capacitive, touch, screen, response, fix, location, charge, internal, capacitor.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004-0178997 A1 (DAVID W. GILLESPIE et al.) 16 September 2004 See the abstract, paragraphs [0148]-[0167] and [0188-0199], figures 8 and 10.	1-34
A	US 2005-0264474 A1 (RODGER RAST) 01 December 2005 See the abstract, paragraphs [0083] and [0101]-[0122], figures 4 and 11.	1-34
A	US 2005-0041002 A1 (HIROSHI TAKAHARA et al.) 24 February 2005 See the abstract, paragraphs [0359]-[0395], figures 33-35 and 37-39.	1-34
A	US 2002-0030666 A1 (HARALD PHILIPP) 14 March 2002 See the abstract, paragraph [0054], figure 9.	1-34

☐ 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 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	Date of mailing of the international search report
28 MARCH 2012 (28.03.2012)	**09 APRIL 2012 (09.04.2012)**

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office Government Complex-Daejeon, 189 Cheongsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea	CHOI, Hoon Young
Facsimile No. 82-42-472-7140	Telephone No. 82-42-481-8365

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/049523

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004-0178997 A1	16.09.2004	AU 2001-49331 A1	15.10.2001
		CN 1153173 C0	09.06.2004
		CN 1155876 C0	30.06.2004
		CN 1164286 A0	05.11.1997
		CN 1166214 A0	26.11.1997
		CN 1185844 A0	24.06.1998
		CN 1202254 A0	16.12.1998
		EP 0574213 B1	24.03.1999
		EP 0665508 B1	16.08.2000
		EP 0777875 B1	04.07.2001
		EP 0777888 B1	03.07.2002
		EP 0829043 A1	18.03.1998
		EP 0861462 A1	02.09.1998
		EP 0870223 B1	24.08.2005
		EP 1288773 A3	19.03.2003
		EP 1607852 A3	09.08.2006
		EP 1659480 A3	09.08.2006
		GB 2376908 A	31.12.2002
		JP 03-526577 B2	27.02.2004
		JP 03-764171 B2	05.04.2006
		JP 03-920833 B2	30.05.2007
		JP 04-014660 B2	28.11.2007
		JP 04-031796 B2	09.01.2008
		JP 08-044493 A	16.02.1996
		JP 10-505182 A	19.05.1998
		JP 10-505183 A	19.05.1998
		JP 11-506559 A	08.06.1999
		JP 11-511580 A	05.10.1999
		JP 2004-094964 A	25.03.2004
		JP 2004-500251 A	08.01.2004
		JP 2005-149531 A	09.06.2005
		KR 10-0264640 B1	02.10.2000
		KR 10-0274772 B1	15.12.2000
		KR 10-0277147 B1	15.01.2001
		KR 10-0729982 B1	20.06.2007
		KR 10-1999-0064226 A	26.07.1999
		TW 223318 B	01.11.2004
		US 05374787A A	20.12.1994
		US 05488204A A	30.01.1996
		US 05495077A A	27.02.1996
		US 05543588A A	06.08.1996
		US 05543590A A	06.08.1996
		US 05543591A A	06.08.1996
		US 05648642A A	15.07.1997
		US 05841078A A	24.11.1998
		US 05861583A A	19.01.1999
		US 05880411A A	09.03.1999
		US 05889236A A	30.03.1999
		US 05914465A A	22.06.1999

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/049523

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 05942733A A	24.08.1999
		US 06028271A A	22.02.2000
		US 2002-0061716 A1	23.05.2002
		US 2002-0093491 A1	18.07.2002
		US 2002-0111122 A1	15.08.2002
		US 2003-0112228 A1	19.06.2003
		US 2004-0067717 A1	08.04.2004
		US 2004-0259476 A1	23.12.2004
		US 2006-0092142 A1	04.05.2006
		US 2006-0187214 A1	24.08.2006
		US 2008-0041640 A1	21.02.2008
		US 2008-0042994 A1	21.02.2008
		US 2008-0048997 A1	28.02.2008
		US 6239389 B1	29.05.2001
		US 6380931 B1	30.04.2002
		US 6390905 B1	21.05.2002
		US 6414671 B1	02.07.2002
		US 6610936 B2	26.08.2003
		US 6612903 B2	02.09.2003
		US 6659850 B2	09.12.2003
		US 6750852 B2	15.06.2004
		US 7014541 B2	21.03.2006
		US 7025664 B2	11.04.2006
		US 7109978 B2	19.09.2006
		US 7140956 B1	28.11.2006
		US 7450113 B2	11.11.2008
		US 7532205 B2	12.05.2009
		US 7812829 B2	12.10.2010
		US 7907127 B2	15.03.2011
		US 7911456 B2	22.03.2011
		WO 01-74534 A2	11.10.2001
		WO 01-74534 A3	11.10.2001
		WO 96-07966 A1	14.03.1996
		WO 96-07981 A1	14.03.1996
		WO 96-11435 A1	18.04.1996
		WO 97-18508 A1	22.05.1997
		WO 97-36225 A1	02.10.1997
US 2005-0264474 A1	01.12.2005	US 2002-0021269 A1	21.02.2002
		US 2008-0068311 A1	20.03.2008
		US 7292209 B2	06.11.2007
US 2005-0041002 A1	24.02.2005	CN 100589162 C	10.02.2010
		CN 1552050 A	01.12.2004
		CN 1552052 A	01.12.2004
		CN 1559064 A	29.12.2004
		EP 1424674 A1	02.06.2004
		EP 1434193 A1	30.06.2004
		EP 1450341 A1	25.08.2004
		JP 04-452075 B2	05.02.2010

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/049523

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		JP 04-452076 B2	05.02.2010
		JP W020-030237 50A1	20.03.2003
		JP W020-030237 52A1	20.03.2003
		JP W020-030279 98A1	03.04.2003
		KR 10-0572428 B1	18.04.2006
		KR 10-0572429 B1	18.04.2006
		KR 10-0714513 B1	07.05.2007
		KR 10-0805522 B1	20.02.2008
		KR 10-0912320 B1	14.08.2009
		US 2005-0030264 A1	10.02.2005
		US 2005-0057580 A1	17.03.2005
		US 2007-0146251 A1	28.06.2007
		US 7528812 B2	05.05.2009
		WO 03-023750 A1	20.03.2003
		WO 03-023752 A1	20.03.2003
		WO 03-027998 A1	03.04.2003
US 2002-0030666 A1	14.03.2002	US 6288707 B1	11.09.2001
		US 6535200 B2	18.03.2003
		WO 98-05025 A1	05.02.1998