



(51) International Patent Classification:

H05K 1/02 (2006.01) H05K 3/46 (2006.01)

H05K 1/18 (2006.01) H01F 17/00 (2006.01)

G02B 27/01 (2006.01) H01F 27/06 (2006.01)

(21) International Application Number:

PCT/US2017/021461

(22) International Filing Date:

09 March 2017 (09.03.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

15/071,481 16 March 2016 (16.03.2016) US

(71) Applicant: MICROSOFT TECHNOLOGY LICENSING, LLC [US/US]; Attn: Patent Group Docketing

(Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US).

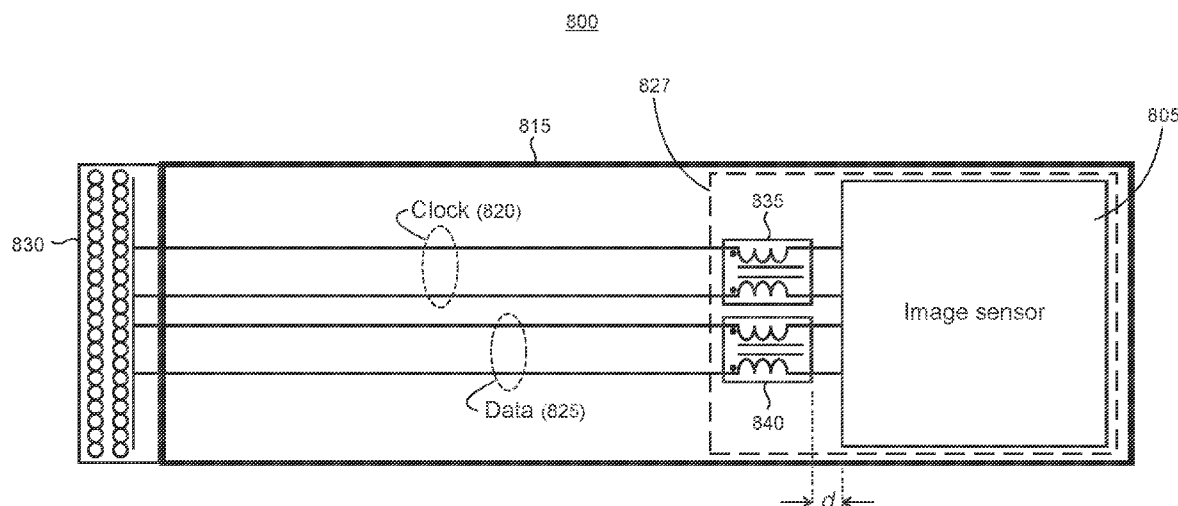
(72) Inventors: Codd, Patrick; Microsoft Technology Licensing, LLC, Attn: Patent Group Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US). MEHTA, Agustya; Microsoft Technology Licensing, LLC, Attn: Patent Group Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (US).

(74) Agent: MINHAS, Sandip et al.; Microsoft Corporation, Attn: Patent Group Docketing (Bldg. 8/1000), One Microsoft Way, Redmond, Washington 98052-6399 (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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,

(54) Title: FLEXIBLE PRINTED CIRCUIT WITH RADIO FREQUENCY CHOKE

FIG 8



(57) Abstract: In an electronic device that employs high-speed differential signaling on one or more pairs of conductors (510, 610) in a flexible printed circuit (215), RF chokes are placed in the differential signal path (120, 125) and mounted directly on the flexible printed circuit which is used to interconnect a peripheral device, such as an image sensor (205, 805, 905), through a connector (230, 830, 930) to another device component such as a main printed circuit board (210). The RF chokes (835, 840, 935, 940) are configured to suppress common-mode noise propagating in the differential pairs of conductors (510, 610). In one illustrative embodiment, the RF chokes are located on the flexible printed circuit adjacent to the peripheral device to suppress common-mode noise near its source. In another illustrative embodiment, the RF chokes are mounted adjacent to the connector to suppress the common-mode noise before it has an opportunity to escape the flexible printed circuit at the major discontinuity presented by the connector.

HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *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:

26 October 2017 (26.10.2017)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/021461

A. CLASSIFICATION OF SUBJECT MATTER INV. H05K1/02 H05K1/18 G02B27/01 ADD. H05K3/46 H01F17/00 H01F27/06		
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) H05K G02B H01F		
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 2009/058559 A1 (PAKKALA WILLIAM F [US]) 5 March 2009 (2009-03-05) abstract; claims 1,8,9; figure 1 paragraphs [0014] - [0019], [0022], [0025], [0026] -----	1-15
X	WO 2006/098076 A1 (MURATA MANUFACTURING CO [JP]; ISHIDA KOSUKE [JP]; AZUMA TAKAHIRO [JP]) 21 September 2006 (2006-09-21) claims 1-4; figures 1,6 -----	1-15
☐ 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 14 August 2017	Date of mailing of the international search report 28/08/2017	
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 Kelly, Derek	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2017/021461

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009058559	A1	05-03-2009	NONE

WO 2006098076	A1	21-09-2006	JP 4803173 B2 26-10-2011
		JP WO2006098076 A1	21-08-2008
		WO 2006098076 A1	21-09-2006
