



(51) International Patent Classification:
H01L 23/60 (2006.01) H01L 23/48 (2006.01)
H01L 25/065 (2006.01)

(74) Agents: BREGMAN, Dion, M. et al.; Morgan Lewis & Bockius LLP, 2 Palo Alto Square, 3000 El Camino Real, Suite 700, Palo Alto, CA 94306 (US).

(21) International Application Number:
PCT/US2010/036020

(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, 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.

(22) International Filing Date:
25 May 2010 (25.05.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/181,251 26 May 2009 (26.05.2009) US

(71) Applicant (for all designated States except US): RAM-BUS INC. [US/US]; 4440 El Camino Real, Los Altos, CA 94022 (US).

(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, SE, SI, SK,

(72) Inventor; and

(75) Inventor/Applicant (for US only): BEST, Scott, C. [US/US]; 4283 Ponce Drive, Palo Alto, CA 94306 (US).

[Continued on next page]

(54) Title: STACKED SEMICONDUCTOR DEVICE ASSEMBLY

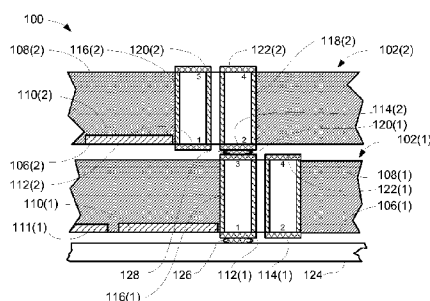


FIG. 1B

(57) Abstract: The semiconductor device system includes multiple stacked substantially identical semiconductor devices each including a first side and an opposing second side. First and second pads are disposed at the first side of the semiconductor device, while third and fourth pads are disposed at the second side of the semiconductor device. First interface circuit is electrically coupled to the first pad and the third pad, while second interface circuit is electrically coupled to the second pad and the fourth pad. The second interface circuit is separate and distinct from the first interface circuit. At least one first semiconductor device of the multiple semiconductor devices is offset from other of the multiple semiconductor devices such that the fourth pad on the first semiconductor device is aligned with, and electrically connected to, the first pad on an adjacent one of the multiple semiconductor devices. In some embodiments, the first pad is associated with a first capacitance, while the second pad is associated with a second capacitance that is smaller than the first capacitance.

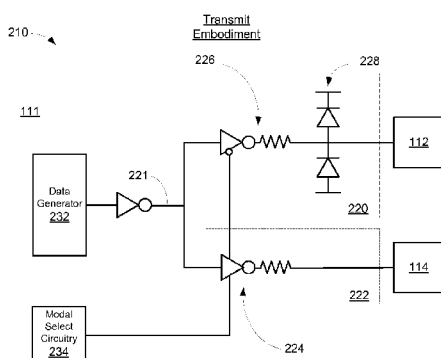


FIG. 2B



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *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))*

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

(88) Date of publication of the international search report:

20 January 2011

Published:

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

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/036020

A. CLASSIFICATION OF SUBJECT MATTER

INV. H01L23/60 H01L25/065 H01L23/48

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)

H01L

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 practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/057384 A1 (ALAM SYED M [US] ET AL) 15 March 2007 (2007-03-15) paragraph [0017] - paragraph [0032]; figures 1-6, 16-19 paragraph [0044]	1, 6, 11, 16
A	US 6 141 245 A (BERTIN CLAUDE LOUIS [US] ET AL) 31 October 2000 (2000-10-31) column 2, line 40 - line 43; figures 1, 10-16 column 4, line 40 - line 43	1-13, 16-20
A	US 2007/096332 A1 (SATO TOMOTOSHI [JP] ET AL) 3 May 2007 (2007-05-03) paragraph [0095] - paragraph [0170]; figures 1-4, 7A-7E, 8-18	1-13, 16-20
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Further documents are listed in the continuation of Box C.



See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"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

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Date of the actual completion of the international search

27 July 2010

Date of mailing of the international search report

22/11/2010

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

Gospodinova, M

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/036020

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006/226529 A1 (KATO YOSHIHARU [JP] ET AL) 12 October 2006 (2006-10-12) paragraph [0162] - paragraph [0225]; figures 1-3,7,23 -----	1-13, 16-20
A	US 2004/232559 A1 (ADELMANN TODD C [US]) 25 November 2004 (2004-11-25) paragraph [0020] - paragraph [0041]; figures 2A-2D,3A-3B -----	1-13, 16-20
A	US 2008/185586 A1 (LIN MOU-SHIUNG [TW]) 7 August 2008 (2008-08-07) figures 3, 4a-4d,5a-5d -----	1-13, 16-20
A	US 2005/121802 A1 (KAWANO MASAYA [JP] ET AL) 9 June 2005 (2005-06-09) paragraph [0052] - paragraph [0096]; figures 1-11 -----	1-13, 16-20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/036020

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-13, 16-20

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13, 16-20

A stacked semiconductor device assembly comprising first and second substantially identical IC devices offset from each other and coupled by sets of through vias, each of said IC devices including two types of interface circuits having substantially different capacitance.

2. claims: 14, 15

An integrated circuit device, comprising I/O buffer circuits, read/write channel master circuits coupled to the I/O buffer circuits and to a first set of through vias, read/write channel slave circuits coupled to a second set of through vias, and a mode select circuitry.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/036020

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