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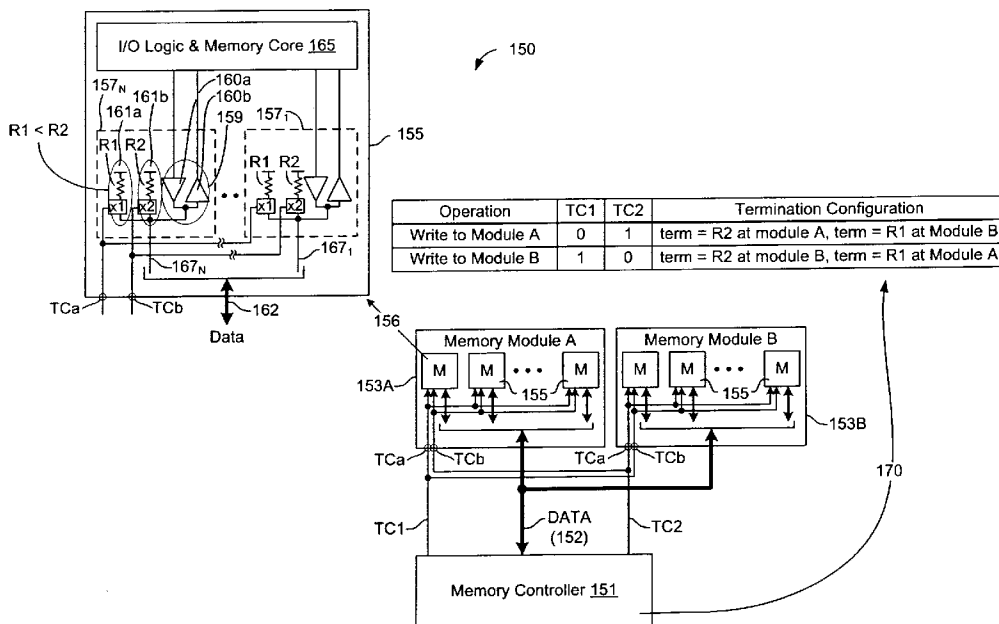
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29 May 2008

(54) Title: INTEGRATED CIRCUIT WITH GRADUATED ON-DIE TERMINATION



(57) Abstract: An integrated circuit device having graduated on-die termination. The integrated circuit device includes an input to receive a data signal, and first and second termination circuits. The first termination circuit includes a first load element and a first switch element to switchably couple the first load element to the data signal input. The second termination circuit includes a second load element and a second switch element to switchably couple the second load element to the data signal input.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/069471

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F13/40

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)
G06F

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)
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 A	US 2003/012046 A1 (LEE BYONG-KWON [KR] ET AL) 16 January 2003 (2003-01-16) abstract page 2, paragraph 20 - paragraph 25 figure 2	1, 2, 30 3-5
P, X	DE 10 2005 036528 A1 (INFINEON TECHNOLOGIES AG [DE]) 1 February 2007 (2007-02-01) abstract page 4, paragraph 31 - page 5, paragraph 37 figure 1	1, 6, 7
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Further documents are listed in the continuation of Box C.

See patent family annex.

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| <p>* Special categories of cited documents:</p> <ul style="list-style-type: none"> *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 *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 | <ul style="list-style-type: none"> *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 19 March 2008	Date of mailing of the international search report 07/04/2008
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Rudolph, Stefan
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/069471

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 2005/226080 A1 (LEE JUNG-BAE [KR]) 13 October 2005 (2005-10-13) abstract page 1, paragraph 1 - page 5, paragraph 51 figures 1-5	6,7
X	----- JEDEC SOLID STATE TECHNOLOGY ASSOCIATION: "DDR2 SDRAM Specification" January 2005 (2005-01), ELECTRONIC INDUSTRIES ALLIANCE , XPO02473555 page 16 - page 20	1
Y	----- US 2003/039151 A1 (MATSUI YOSHINORI [JP]) 27 February 2003 (2003-02-27) abstract page 3, paragraph 35 - paragraph 43 figures 1,2	13-16
Y	----- US 6 424 200 B1 (MCNITT JOHN [US] ET AL) 23 July 2002 (2002-07-23) abstract column 1, line 30 - line 54 column 2, line 10 - column 4, line 34 figures 2,3	13-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/069471.

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 allsearchable 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.:

1-7, 13-16, 30

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.:

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: 1-5, 30

Only one terminal is conductive at a time.

2. claims: 6, 7

Providing a configuration circuit storing and supplying a digital value to the first termination circuit.

3. claims: 8-10

Switchably coupling a receive circuit to an address selected one of a plurality of memory interfaces.

4. claims: 11-12, 17-29, 31

Distinguishing whether a transaction is directed to the integrated circuit or not.

5. claims: 13-16

Receiving a first and a second control input and including a plurality of memory devices wherein each being coupled to a respective subset of a plurality of data inputs.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2007/069471

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2003012046	A1	16-01-2003	JP 2003115200 A KR 20030006525 A	18-04-2003 23-01-2003
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US 6424200	B1	23-07-2002	NONE	