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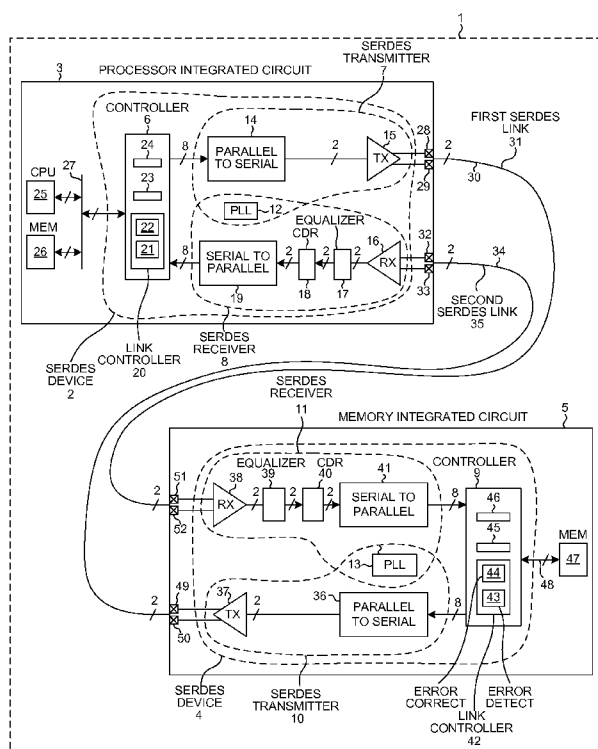
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[Continued on next page]

(54) **Title:** SERDES POWER THROTTLING AS A FUNCTION OF DETECTED ERROR RATE



SERDES SYSTEM
FIG. 1

(57) **Abstract:** A system involves a first SerDes link from a first integrated circuit (IC) to a second IC and a second link from the second IC to the first IC. Power consumption settings in circuitry of the first link are adjusted to control power consumption such that the bit error rate of the first link is maintained in a range, where the lower bound of the range is substantially greater than zero. Power consumption settings in circuitry for the second link are adjusted to control power consumption such that the bit error rate of the second link is maintained in range, where the lower bound of the range is substantially greater than zero. In one example, circuitry in the second IC detects errors in the first link and reports back via the second link. The first IC uses the reported information to determine a bit error rate for the first link.



(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, 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).

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))*

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/025526

A. CLASSIFICATION OF SUBJECT MATTER
INV. H03M9/00 H04W52/02
ADD.

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)
H03M H04W

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	JP 2010 258747 A (NEC SAITAMA LTD) 11 November 2010 (2010-11-11)	1-5, 9-18, 33-41
Y	abstract paragraphs [0002] - [0018], [0031] - [0039], [0043], [0053], [0054] figures 1-5	6-8
Y,P	----- EP 2 317 655 A1 (OMRON TATEISI ELECTRONICS CO [JP]) 4 May 2011 (2011-05-04) abstract paragraphs [0024] - [0031] figures 1-18	6-8
Y	& WO 2010/021164 A1 (OMRON CORP) 25 February 2010 (2010-02-25) abstract ----- -/-	6-8



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

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"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

7 September 2012

Date of mailing of the international search report

17/09/2012

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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/158056 A1 (KIM YONG-SUB [KR]) 21 July 2005 (2005-07-21)	1-5, 9-18, 33-41
Y	abstract paragraphs [0040], [0041], [0096] - [0111], [0117] - [0122] figures 1, 2, 6, 7, 11-15 -----	6-8
A	US 2009/257514 A1 (CONNOLLY BRIAN J [US] ET AL) 15 October 2009 (2009-10-15) abstract paragraphs [0004], [0006] - [0017] figures 1-3 -----	19-32, 42-47
A	US 2009/304054 A1 (TONIETTO DAVIDE [CA] ET AL) 10 December 2009 (2009-12-10) abstract paragraphs [0033] - [0055] figures 1-8 -----	19-32, 42-47

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/025526

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.:

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: 1-18, 33-41

Power consumption adjustment in a SerDes link.

Problem: minimize power consumption in a SerDes link

Solution: adjust power consumption based on the detected error rate.

2. claims: 19-32, 42-47

Impedance adjustment in a SerDes link.

Problem: maintain reception quality in a SerDes link

Solution: adjust receiver impedance based on the detected error rate.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/025526

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2010258747	A	11-11-2010	NONE
EP 2317655	A1	04-05-2011	CN 102106089 A 22-06-2011
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