



- (51) International Patent Classification:
G01R 31/36 (2006.01) *G01R 19/165* (2006.01)
- (21) International Application Number:
PCT/US2012/021812
- (22) International Filing Date:
19 January 2012 (19.01.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/435,509 24 January 2011 (24.01.2011) US
- (71) Applicant (for all designated States except US): **SUN-RISE MICRO DEVICES, INC.** [US/US]; 9181 Glades Rd., Ste. 125, Boca Raton, FL 33434 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **MARTIN, Frederick, L.** [US/US]; 9181 Glades Rd., Ste. 125, Boca Raton, FL 33434 (US). **CALLAWAY, Edgar, H., Jr.** [US/US]; 9181 Glades Rd., Ste. 125, Boca Raton, FL 33434 (US).
- (74) Agent: **LEVEQUE, Renée Michelle**; Leveque Intellectual Property Law, P.C., 241 E. 4th St., Ste. 102, Frederick, MD 21701 (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, RW, 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.

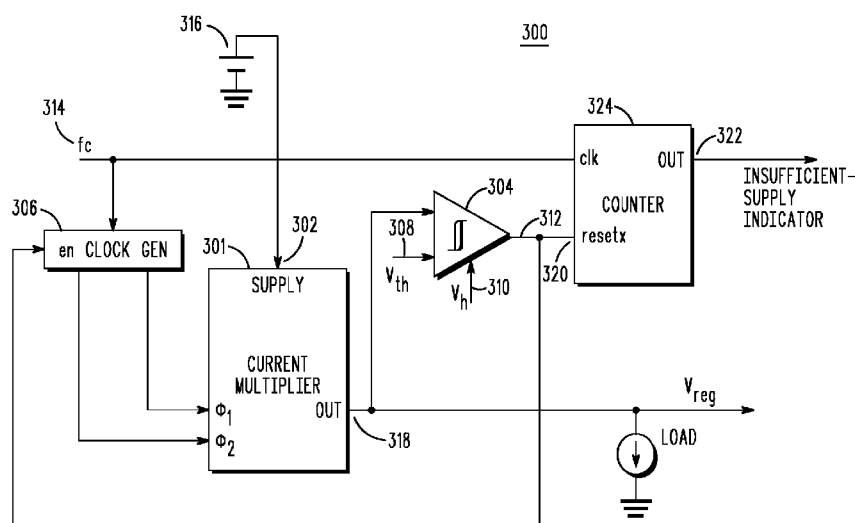
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, 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))
- 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:

1 November 2012

(54) Title: DETECTION OF INSUFFICIENT SUPPLIED POWER**FIG. 3**

(57) **Abstract:** A method, apparatus, and device provide for the detection of insufficient supplied power supplied to a device. A current multiplier of the device, operable as a voltage regulator, is coupled to the power source, receives a clock signal, and generates a control signal. A digital counter, clocked by the clock signal and reset by the control signal, generates an overflow output in response to an overflow condition of the digital counter that indicates that the current sourcing capability of the power source has fallen below a current threshold of the device. A compensatory response by the device in response to the detection of insufficient supplied power may be provided as well.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/021812**A. CLASSIFICATION OF SUBJECT MATTER****G01R 31/36(2006.01)i, G01R 19/165(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)

G01R 31/36; H01M 10/42; H02J 7/00; H04B 1/40; G01N 27/416

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: current, source, power, adequacy, voltage regulator, power source, clock, control, signal, overflow, output, overflow condition, digital counter, current threshold, capability, multiplier, insufficient-supply, indication

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-093465 A (TOKYO GAS CO LTD et al.) 29 March 2002 See the abstract, paragraphs [0007]-[0008], [0017]-[0042], claim 1, and figures 1,3,4	1-24
A	US 2003-0169020 A1 (JOHN STUART MALCOLM) 11 September 2003 See the abstract, paragraphs [0028]-[0039], claim 1, and figures 2,3	1-24
A	KR 10-2004-0076535 A (SK TELETEC CO., LTD.) 01 September 2004 See the abstract, pages 2-3, claim 1, and figures 2,3	1-24
A	US 06054861A A (SUSUMU TAKAHASHI) 25 April 2000 See the abstract, column 5, line 19-column 8, line 28, and figures 2,4,6	1-24



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

31 AUGUST 2012 (31.08.2012)

Date of mailing of the international search report

03 SEPTEMBER 2012 (03.09.2012)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

PARK, Keun Yong

Telephone No. 82-42-481-8508



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/021812

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2002-093465 A	29.03.2002	JP 4180778 B2	12.11.2008
US 2003-0169020 A1	11.09.2003	EP 1343018 A1	10.09.2003
		US 6552579 B1	22.04.2003
		US 6661204 B2	09.12.2003
KR 10-2004-0076535 A	01.09.2004	None	
US 06054861A A	25.04.2000	JP 08-136628 A	31.05.1996
		US 05841284A A	24.11.1998