(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 January 2009 (08.01.2009)

PCT

(10) International Publication Number
WO 2009/006067 A3

(51) International Patent Classification:
H02H 7/20 (2006.01) *H03K 17/08* (2006.01)
H02H 7/00 (2006.01)

(21) International Application Number:
PCT/US2008/067865

(22) International Filing Date: 23 June 2008 (23.06.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/946,904 28 June 2007 (28.06.2007) US
12/124,279 21 May 2008 (21.05.2008) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 12/124,279 (CON)
Filed on 21 May 2008 (21.05.2008)

(71) Applicant *(for all designated States except US)*: **TEXAS INSTRUMENTS INCORPORATED** [US/US]; P.O. Box 655474, Mail Station 3999, Dallas, TX 75265-5474 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **MARTINEZ, Robert** [US/US]; 1934 North Fork Lane, Lucas, TX 75002 (US). **STAIR, Richard, K.** [US/US]; 1425 Whitower Drive, Knoxville, TN 37919 (US).

(74) Agents: **TEXAS INSTRUMENTS INCORPORATED** et al.; FRANZ, Warren, L., Deputy General Patent Counsel, P.O. Box 655474, Ms 3999, Dallas, TX 75265-5474 (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, 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, PG, PH,

[Continued on next page]

(54) Title: PROGRAMMABLE POWER LIMITATION FOR POWER TRANSISTOR SYSTEM

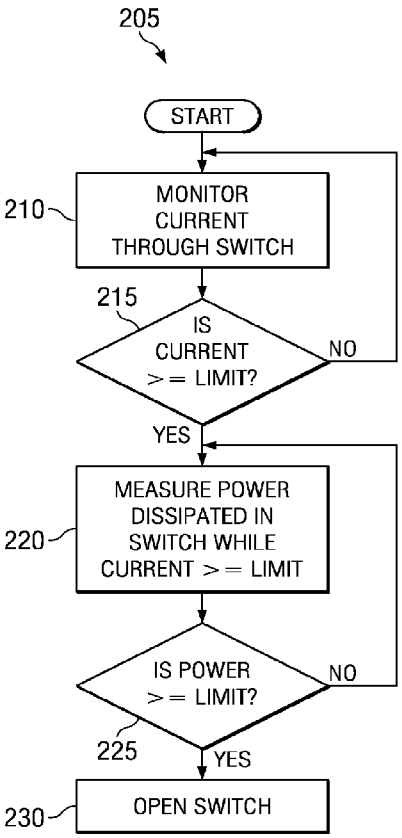


FIG. 3

(57) Abstract: Various systems, methods and apparatuses are provided herein for limiting power dissipation in a switch. As one example, a method for limiting power dissipation is disclosed. The method includes monitoring current (210) through the switch, and based at least in part on detecting that the current is at least as great as a predetermined current limit (215), regulating the current to the predetermined current limit. The method also includes measuring an amount of power dissipated (220) in the switch while the current is being regulated, and opening the switch (230) when the amount of power has reached a predetermined power limit.

WO 2009/006067 A3

PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US (patent), UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, 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*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) **Date of publication of the international search report:**
19 February 2009

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/067865

A. CLASSIFICATION OF SUBJECT MATTER

H02H 7/20(2006.01)i, H02H 7/00(2006.01)i, H03K 17/08(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)

IPC : H02H 7/20, H02M 3/335, G05F 1/58, H02D 5/16, H20H 3/00, H03K 19/003

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 since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS "SWITCH, CURRENT REGULATOR, POWER METER, LIMIT, POWER DISSIPATION, MONITOR, CURRENT"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5995386 A (PAUL JOHN et al.) 30 November 1999 See the Abstract, Claims 1, 11, 24 and Figures 2-4	1-15
A	US 4156837 A (DONAL E BAKER) 29 May 1979 See the Abstract, Claims 1-2 and Figures 1-2	1-15
A	US 4035703 A (KURT HABLUTZEL) 12 July 1977 See the Abstract	1-15
A	US 7046494 B2 (STUART R. BALL) 16 May 2006 See the Abstract	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 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	Date of mailing of the international search report
16 JANUARY 2009 (16.01.2009)	**16 JANUARY 2009 (16.01.2009)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

LEE, Joon Sung

Telephone No. 82-42-481-8544

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/067865

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5995386 A	30.11.1999	NONE	
US 4156837 A	29.05.1979	CA 1093639 A1	13.01.1981
		DE 2814836 C2	13.04.1989
		FR 2387553 A1	10.11.1978
		GB 1587595 A	08.04.1981
		IT 1105590 B	04.11.1985
		JP 53-127661 A	08.11.1978
		NL 7803252 A	17.10.1978
US 4035703 A	12.07.1977	CH 588788 A5	15.06.1977
		DE 2461583 A1	24.06.1976
		FR 2295642 A1	16.07.1976
		GB 1513050 A	07.06.1978
		JP 51-084058 A	23.07.1976
		JP 58-053363 B	29.11.1983
		NL 7512949 A	22.06.1976
US 7046494 B2	16.05.2006	NONE	