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(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.

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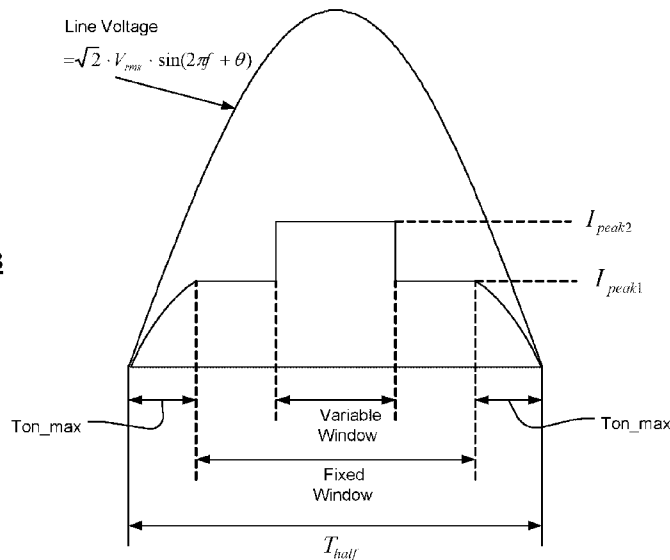
**Declarations under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

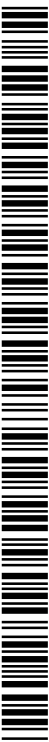
[Continued on next page]

(54) Title: TWO-PEAK CURRENT CONTROL FOR FLYBACK VOLTAGE CONVERTERS

**FIG. 1B**



(57) Abstract: A current control in a Flyback converter. The converter input is a rectified pulsating (sinusoidal) voltage. The output current peak is limited to different levels at different time instants of the sinusoidal fundamental.





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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))* — *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))*

**Published:**

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

**(88) Date of publication of the international search report:**  
25 April 2013

**INTERNATIONAL SEARCH REPORT**

International application No PCT/US2012/026687
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. H02M1/42 H02M3/335 H05B33/08  
 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)  
 H02M H05B

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	US 7 433 211 B1 (COLLMEYER ARTHUR J [US] ET AL) 7 October 2008 (2008-10-07) the whole document -----	1-12
X	US 4 920 472 A (HANDLER HOWARD [US]) 24 April 1990 (1990-04-24) the whole document -----	1-12
X	WO 2009/156891 A1 (NXP BV [NL]; KOOLEN GERT-JAN [NL]; VASTERINK MARTIN [NL]) 30 December 2009 (2009-12-30) the whole document -----	1-12
X	WO 2008/132501 A2 (CAMBRIDGE SEMICONDUCTOR LTD [GB]; RYAN PAUL [GB]) 6 November 2008 (2008-11-06) the whole document -----	1-12
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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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  19 February 2013	Date of mailing of the international search report  11/03/2013
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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, Fax: (+31-70) 340-3016	Authorized officer  Jansen, Helma
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## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/026687

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 2009/303756 A1 (HUANG PEI-LUN [TW] ET AL) 10 December 2009 (2009-12-10) the whole document -----	1-12
A	US 5 335 162 A (MARTIN-LOPEZ FERNANDO R [US] ET AL) 2 August 1994 (1994-08-02) the whole document -----	1-12
A	CN 101 777 848 A (HANGZHOU SILAN MICROELECTRONIC HANGZHOU SILAN MICROELECT CO) 14 July 2010 (2010-07-14) the whole document	1-12
E	& US 2012/155121 A1 (YAO YUNLONG [CN]) 21 June 2012 (2012-06-21) the whole document -----	1-12

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2012/026687

## 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.: 1-12(partially)  
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:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
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:

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.

## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/026687

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7433211	B1	07-10-2008	US 7433211 B1 07-10-2008
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			US 2012155121 A1 21-06-2012
			WO 2011079629 A1 07-07-2011
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**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

Continuation of Box II.2

Claims Nos.: 1-12(partially)

The claims are unclear and illogical.

Independent claims 1 and 7 state that a switch is switched off when the current trough it passes a first threshold. It states further, that the same switch is switched off, when the current passes a second, higher threshold. It is not apparent, how a current through a switch wich has already been switched off (due to the first threshold) could pass the second threshold as the current through the switch never would reach the second threshold. The search has been restricted to a likely embodiment which could be derived from the drawings description. However, the description does not support and disclosure in the sense of Article 6 and 5 PCT only to a limited degree, as some essential features are missing not only from the claims, but also from the description. This non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of the claims (PCT Guidelines 9.19 and 9.36). The search of claims 1-12 was consequently restricted to a flyback converter with a switch having a changeable duty cycle and peak current switching.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2) declaration be overcome.