

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 May 2003 (30.05.2003)

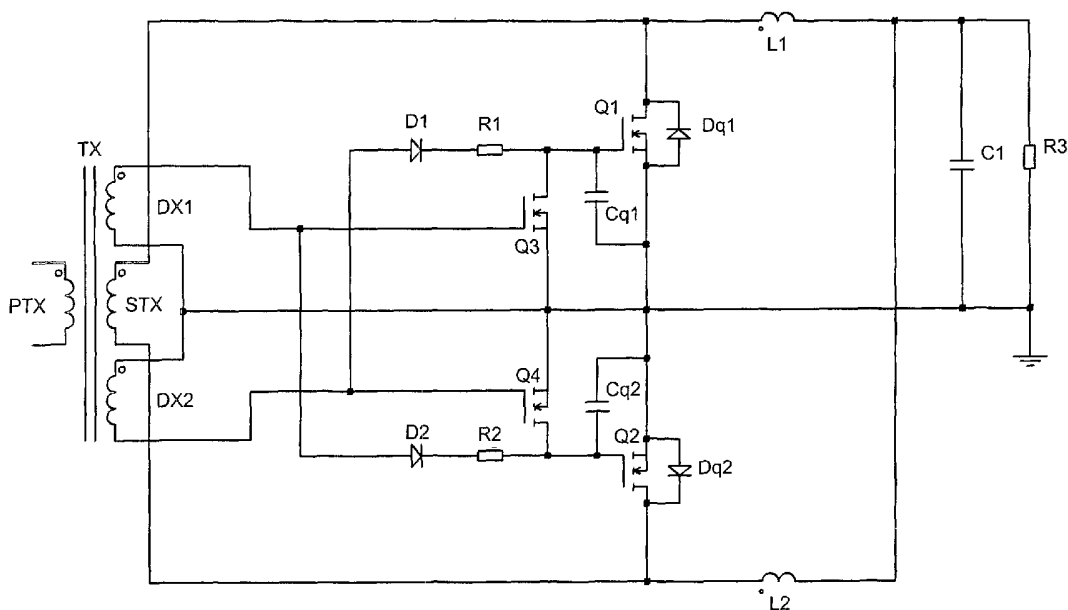
PCT

(10) International Publication Number
WO 03/044937 A3

- (51) International Patent Classification⁷: H02M 3/335
- (21) International Application Number: PCT/GB02/05156
- (22) International Filing Date:
14 November 2002 (14.11.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0127593.2 17 November 2001 (17.11.2001) GB
- (71) Applicant (for all designated States except US): **ADVANCED POWER CONVERSION PLC** [GB/GB];
Unit B5, Armstrong Mall, Southwood Summit Centre,
Farnborough, Hants GU14 0NR (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **GUIJARRO, Victor**
[GB/GB]; Advanced Power Conversion Plc, Unit B5,
Armstrong Mall, Southwood Summit Centre, Farnbor-
ough, Hants GU14 0NR (GB).
- (74) Agent: **HILLGATE PATENT SERVICES**; 6 Aztec Row,
Berners Road, Islington, London N1 0PW (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,
SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,
ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
30 October 2003

[Continued on next page]

(54) Title: DC-TO-DC CONVERTERS



(57) Abstract: The primary side of a DC-to-DC converter produces alternating positive and negative pulses separated by quiescent periods, coupled through a transformer TX to the secondary side, which comprises a bridge circuit of two MOSFET transistor switches Q1, Q2 and two inductors L1, L2 with the secondary winding STX connected between the two transistor-inductor junctions, the switches being controlled from the transformer. Each of the switches Q1, Q2 is controlled from separate control winding means DX1, DX2 on the transformer via a diode D1, D2 and a control transistor Q3, Q4. Alternatively, a single control winding and further diode coupling circuitry may be used.



WO 03/044937 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/05156

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H02M3/335</p>		
<p>According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) IPC 7 H02M</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 275 401 B1 (XIA GANG) 14 August 2001 (2001-08-14) abstract figures 3,4 column 2, line 13 - line 50 ---	1-4,6-9
A	US 6 084 792 A (HUA GUICHAO ET AL) 4 July 2000 (2000-07-04) abstract; claim 1; figures 12,13 column 3, line 17 - line 65 --- -/--	1,9
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.</p>		
<p>* Special categories of cited documents :</p>		
<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*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)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>		<p>*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</p> <p>*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</p> <p>*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.</p> <p>* & * document member of the same patent family</p>
<p>Date of the actual completion of the international search 5 June 2003</p>		<p>Date of mailing of the international search report 13/06/2003</p>
<p>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</p>		<p>Authorized officer Thisse, S</p>

INTERNATIONAL SEARCH REPORT

Internat Application No
PCT/GB 02/05156

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>COBOS J A ET AL: "New driving scheme for self driven synchronous rectifiers" APPLIED POWER ELECTRONICS CONFERENCE AND EXPOSITION, 1999. APEC '99. FOURTEENTH ANNUAL DALLAS, TX, USA 14-18 MARCH 1999, PISCATAWAY, NJ, USA, IEEE, US, 14 March 1999 (1999-03-14), pages 840-846, XP010323576 ISBN: 0-7803-5160-6 the whole document -----</p>	1,5-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No PCT/GB 02/05156

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
US 6275401	B1	14-08-2001	CN 1394383 T	29-01-2003
			EP 1247326 A2	09-10-2002
			NO 20023314 A	05-09-2002
			WO 0152394 A2	19-07-2001
US 6084792	A	04-07-2000	NONE	