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- (81) **Designated States (unless otherwise indicated, for every  
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**Declarations under Rule 4.17:**

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(in))

**Published:**

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- (88) **Date of publication of the international search report:**  
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(54) **Title:** ZERO-VOLTAGE-SWITCHING CONTOUR BASED OUTPHASING POWER AMPLIFIER

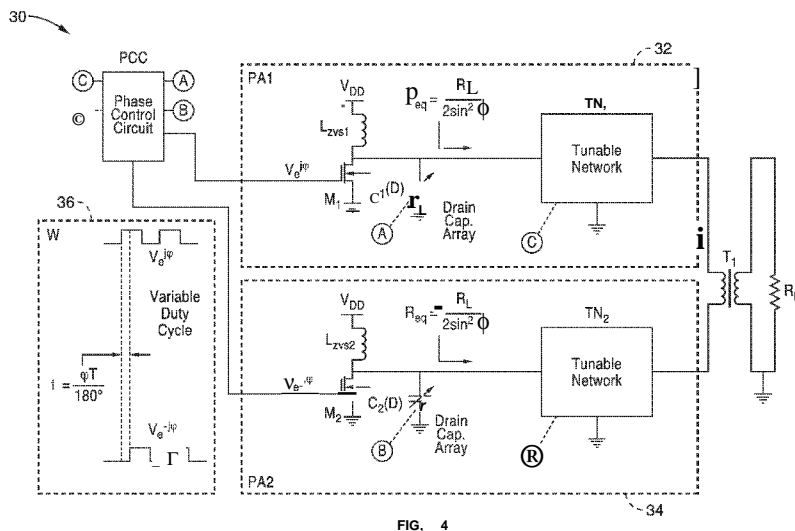


FIG. 4

(57) **Abstract:** A zero-voltage-switching contour based outphasing power amplifier having two class-E power amplifiers connected in an out-phasing architecture coupled on opposite sides of a load being driven. The pair of class-E power amplifiers receive separate digital drive signals with an amount of phase difference that is adjusted based on the load. Variable capacitor arrays are coupled in parallel on the class-E power amplifiers and controlled in response to system parameters including duty cycle of the input signal. Efficiency of the power amplifier is maintained despite variation in output loading.

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## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2012/049075****A. CLASSIFICATION OF SUBJECT MATTER*****H03F 3/60(2006.01)i, H03F 3/68(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)

H03F 3/60; H03H 7/48; H03F 3/68; H03F 1/32; H03F 3/04

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) &amp; keywords: ZVS outphasing, power amplifier, variable capacitor, bandpass filter, transistor switching

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7202734 B1 (FREDERICK HERBERT RAAB ) 10 April 2007 see abstract, claim 1 and figures 2,12-13,15,20-22.	1-20
A	US 2005-0073374 A1 (VICTOR KOROL) 07 April 2005 see abstract, claims 1,3,5,10, figure 2.	1-20
A	WO 2003-047093 A1 (TELEFONAKT IEBOLAGET LM ERICSSON et al.) 05 June 2003 see abstract, claim 1, figure 2.	1-20



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

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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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

27 FEBRUARY 2013 (27.02.2013)

Date of mailing of the international search report

**28 FEBRUARY 2013 (28.02.2013)**

Name and mailing address of the ISA/KR

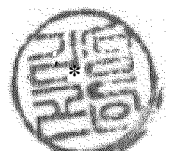


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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/049075**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7202734 B1	10 .04 .2007	None	
US 2005-0073374 A1	07 .04 .2005	JP 2007-522690 A JP 2007-522690 T KR 10-0832 160 B1 KR 10-2006-006 1859 A US 70307 14 B2 WO 2005-036732 A1	09 .08 ,2007 09 .08 ,2007 23 .05 ,2008 08 .06 ,2006 18 .04 ,2006 21 .04 ,2005
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