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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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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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(54) Title: AN INTEGRATED CIRCUIT WITH COMPENSATION FOR ERRORS INDUCED BY SELF-HEATING IN COMPONENTS

(57) Abstract: Many electronic circuits rely on the ratio of one component to other components being well defined. Current flow in component can warm the component causing its electrical properties to change, for example the resistance of a resistor may increase due to self heating as a result of current flow. The present disclosure provides a way to reduce temperature variation between components so as to reduce electrical mismatch between them or the consequences of such mismatch. This is important as even a change of resistance of, for example, 20 - 50 ppm in a resistor can result in non-linearity exceeding the least significant bit value of a 16 bit digital to analog converter.

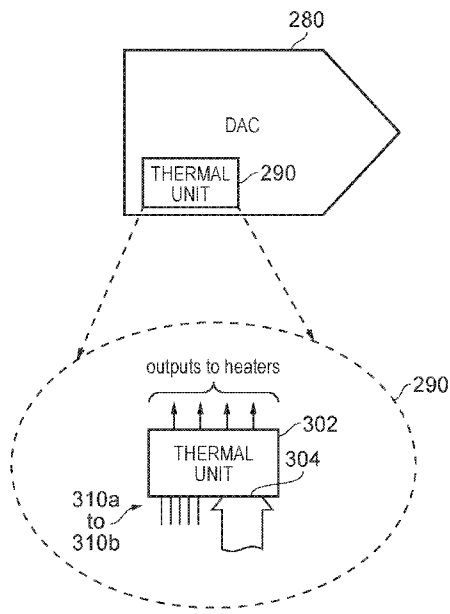


FIG. 7



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:

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INTERNATIONAL SEARCH REPORT

International application No PCT/IB2017/000596

A. CLASSIFICATION OF SUBJECT MATTER INV. H03M1/06 ADD. H03M1/74		
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) H03M		
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, COMPENDEX, INSPEC, IBM-TDB		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HIGHTON F J ET AL: "An 18-bit DAC for consumer applications", 19880912; 19880912 - 19880913, 12 September 1988 (1988-09-12), pages 86-89, XP010076555,	1-12, 15-22, 24,26,36
A	Abstract; page 87; figure 1	13,14, 23,25,27
X	----- WO 2010/052683 A2 (NXP BV [NL]; KONING JAN JACOB [NL]; VAN BEEK JOZEF THOMAS MARTINUS [NL]) 14 May 2010 (2010-05-14)	1-4, 6-17, 20-24, 26,36
A	pages 1-4; claims 1-15; figures 1,6	5,18,19, 25,27
X	----- US 5 424 510 A (GUSINOV ALEX [US] ET AL) 13 June 1995 (1995-06-13)	20-27
A	columns 2-4; claims 1,3,5,9,30,31; figures 2,4,5 -----	1-19
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 <div style="text-align: center; font-size: 1.2em;">2 November 2017</div>	Date of mailing of the international search report <div style="text-align: center; font-size: 1.2em;">08/11/2017</div>	
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 <div style="text-align: center; font-size: 1.2em;">Jesus, Paulo</div>	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/000596

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.:
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:

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:

see additional sheet

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.:

1-27, 36

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

Information on patent family members

International application No

PCT/IB2017/000596

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010052683	A2	14-05-2010	
		CN 102210099 A	05-10-2011
		EP 2356744 A2	17-08-2011
		US 2011215877 A1	08-09-2011
		WO 2010052683 A2	14-05-2010

US 5424510	A	13-06-1995	NONE

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-27, 36

Integrated circuit comprising heating structures and a controller

2. claims: 28-30

Integrated circuit comprising an input signal pré-distortion control circuit

3. claims: 31-35

Amplifier comprising a power compensator
