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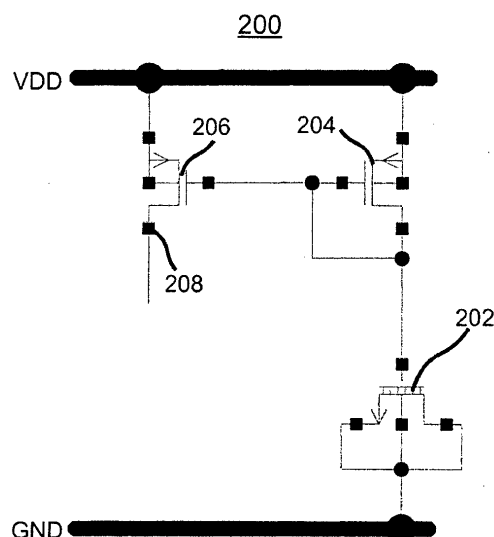
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(54) **Methods and circuits for providing stable current and voltage references based on currents flowing through ultra-thin dielectric layer components**

(57) Low-power circuits for providing stable voltage and current references rely on currents flowing through ultra-thin dielectric layer components for operation. A current reference circuit includes driving circuitry operative to apply a voltage to the first terminal of the component in order to cause a current to flow through the dielectric layer, and sources a reference output current that is

based on the current flow through the dielectric layer in response to the applied voltage. A voltage reference circuit includes a current source which applies a current to the ultra-thin dielectric layer component, and maintains an output node at a stable reference output voltage level based on the voltage across the ultra-thin dielectric layer component in response to the current flow through the dielectric layer.

FIG. 2A



**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

EP 12 00 7509

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2008/169869 A1 (ABADEER WAGDI W [US] ET AL) 17 July 2008 (2008-07-17) * abstract; figure 2 *	4-8,10, 11,14	INV. G05F3/24
X	US 2008/169837 A1 (ABADEER WAGDI W [US] ET AL) 17 July 2008 (2008-07-17) * abstract; figures 3,4 *	4	
X	US 6 917 319 B1 (ABADEER WAGDI W [US] ET AL) 12 July 2005 (2005-07-12) * abstract; figures 2,6 *	4	
A	US 5 883 798 A (YAMAGUCHI MOTOI [JP]) 16 March 1999 (1999-03-16) * figure 5 *	10,11	
A	US 2002/005749 A1 (DESCOMBES ARTHUR [CH]) 17 January 2002 (2002-01-17) * figures 1,2,5 *	10,11	
			TECHNICAL FIELDS SEARCHED (IPC)
			G05F
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search		Date of completion of the search	Examiner
The Hague		15 October 2013	Arias Pérez, Jagoba
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**INCOMPLETE SEARCH
SHEET C**

Application Number

EP 12 00 7509

Claim(s) completely searchable:
4-14

Claim(s) not searched:
1-3, 15

Reason for the limitation of the search:

The claims filed with the application contain three independent apparatus claims 1, 4 and 15. The search division, in an invitation pursuant to Rule 62a(1) EPC dated 31 July 2013, invited the applicant to indicate the claims complying with Rule 43(2) EPC on the basis of which the search was to be carried out. The applicant indicated in his letter of 29 August 2013 that the search should be carried out on the basis of independent claim 4 and its dependent claims.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 00 7509

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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15-10-2013

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82