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(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, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

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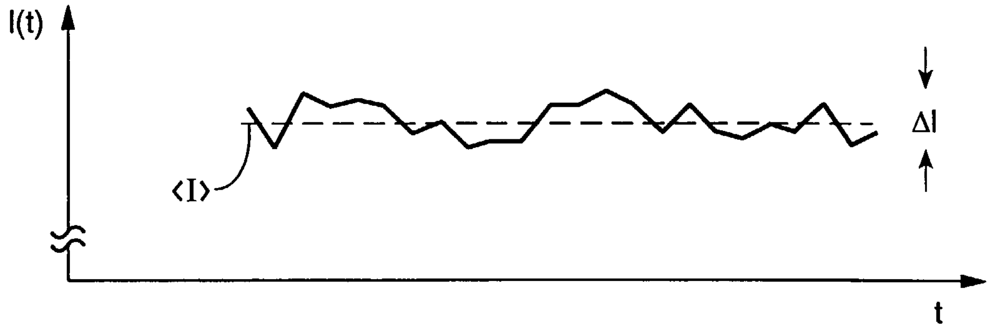
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NOISE REDUCTION TECHNIQUE FOR TRANSISTORS AND SMALL DEVICES UTILIZING AN EPISODIC AGITATION



(57) **Abstract:** The present invention presents methods for reducing the amount of noise inherent in the reading of a non-volatile storage device by applying an episodic agitation (e.g. a time varying voltage) to some terminal(s) of the cell as part of the reading process. Various aspects of the present invention also extend to devices beyond non-volatile memories. According to one aspect of the present invention, in addition to the normal voltage levels applied to the cell as part of the reading process, a time varying voltage is applied to the cell. A set of exemplary embodiments apply a single or multiple set of alternating voltages to one or more terminals of a floating gate memory cell just prior to or during the signal integration time of a read process. In other embodiments, other reproducible external or internal agitations which are repeatable, and whose average effect (from one integration time to the next integration time) remains sufficiently constant so as to have a net noise reduction effect is applicable.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G11C16/26 G11C11/56

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)
IPC 7 G11C

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 27931 A (APLUS FLASH TECHNOLOGY INC) 19 April 2001 (2001-04-19)	1-7,9, 15,16, 29-32, 34,35, 39,40, 53-57
A	page 7, line 18 -page 8, line 14; figures 1,4	8,10-14, 17-28, 33, 36-38, 41-52, 58-70

A	WO 95 19047 A (HYUNDAI ELECTRONICS IND) 13 July 1995 (1995-07-13) page 11, line 8-15; figures 2A-C	1-70

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
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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
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"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.
"&" document member of the same patent family

Date of the actual completion of the international search 30 September 2003	Date of mailing of the international search report 10/10/2003
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	Authorized officer Lindquist, J

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	MA Y ET AL: "A dual-bit split-gate EEPROM (DSG) cell in contactless array for single-Vcc high density flash memories" ELECTRON DEVICES MEETING, 1994. TECHNICAL DIGEST., INTERNATIONAL SAN FRANCISCO, CA, USA 11-14 DEC. 1994, NEW YORK, NY, USA,IEEE, 11 December 1994 (1994-12-11), pages 57-60, XP010131952 ISBN: 0-7803-2111-1 page 3.5.2, left-hand column, line 30 -right-hand column, line 3 -----	1-70

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte nal Application No
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