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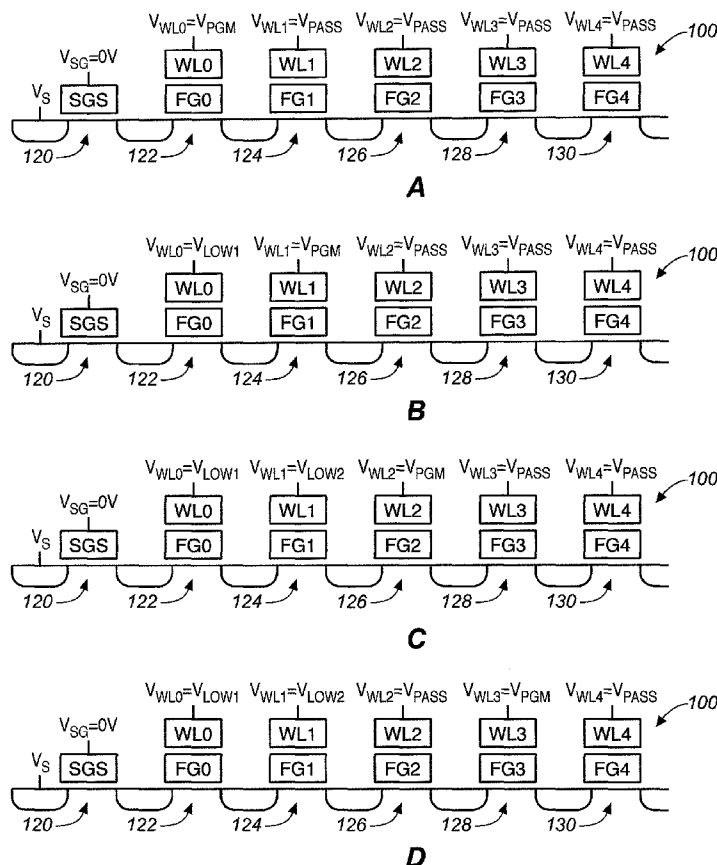
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[Continued on next page]

(54) Title: SELF-BOOSTING METHOD FOR FLASH MEMORY CELLS



(57) Abstract: A low voltage (e.g. of the order of or one to three volts) instead of an intermediate VPASS voltage (e.g. of the order of five to ten volts) is applied to word line zero immediately adjacent to the source or drain side select gate of a flash device such as a NAND flash device and one or more additional word lines next to such word line to reduce or prevent the shifting of threshold voltage of the memory cells coupled to word line zero during the programming cycles of the different cells of the NAND strings. Different intermediate boosting voltage (s) (e.g. of the order of five to ten volts) may be applied to one or more of the word lines adjacent to the selected word line (that is the word line programming the selected transistor), where the boosting voltage (s) applied to the word line(s) adjacent to the selected word line are/is different from that or those applied to other unselected word lines.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G11C16/04 G11C16/10

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)
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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X, L	US 2005/174852 A1 (HEMINK GERRIT J [JP] HEMINK GERRIT JAN [JP]) 11 August 2005 (2005-08-11) paragraphs [0062] - [0072]; figures 8C-D, 9C-D	1-28
P, X, L	----- WO 2006/124525 A (SANDISK CORP [US]; WAN JUN [US]; LUTZE JEFFREY [US]; HIGASHITANI MASAA) 23 November 2006 (2006-11-23) figure 14	1-4, 7
X	----- JP 09 082922 A (TOKYO SHIBAURA ELECTRIC CO) 28 March 1997 (1997-03-28) figures 10, 11	1-4, 7-9, 12
P, X	----- US 2006/227613 A1 (JOO SEOK J [KR]) 12 October 2006 (2006-10-12) figures 10-12	1-28
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No
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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.
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A	US 5 793 677 A (HU CHUNG-YOU [US] ET AL) 11 August 1998 (1998-08-11) figure 6	1,13
X	US 6 107 658 A (ITOH YASUO [JP] ET AL) 22 August 2000 (2000-08-22) figures 13,15	29-34
X	US 2005/226055 A1 (GUTERMAN DANIEL C [US]) 13 October 2005 (2005-10-13) paragraph [0073]; figures 12a-b	29,30, 32-34
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X	US 5 621 684 A (JUNG TAE-SUNG [KR]) 15 April 1997 (1997-04-15) figure 5	29,30, 32-34
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/062338

Box 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 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 fee, this Authority did not invite payment of any additional fee.
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.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-28

NAND string programming method with boosting and disturb
reduction of cells adjacent to the source line

2. claims: 29-36

NAND string programming method with boosting and disturb
reduction on adjacent wordline of the programmed wordline

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2006/062338

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