



- (51) **International Patent Classification:**
H01L 21/8239 (2006.01) *H01L 21/8244* (2006.01)
H01L 21/8242 (2006.01) *H01L 21/8247* (2006.01)
- (21) **International Application Number:**
PCT/US2010/025034
- (22) **International Filing Date:**
23 February 2010 (23.02.2010)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
12/390,703 23 February 2009 (23.02.2009) US
- (71) **Applicant (for all designated States except US):** **MI-CRON TECHNOLOGY, INC.** [US/US]; 8000 South Federal Way, Boise, ID 83716 (US).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** **PRALL, Kirk D.** [US/US]; 2548 SO. Harmony, Boise, ID 83706 (US).
- (74) **Agent:** **LEFFERT, Thomas W.;** Leffert Jay & Polglaze, P.A., P.O. Box 581009, Minneapolis, MN 55458-1009 (US).
- (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, BR, BW, BY, BZ,

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, 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.

- (84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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:**
4 November 2010

(54) **Title:** RIGID SEMICONDUCTOR MEMORY HAVING AMORPHOUS METAL OXIDE SEMICONDUCTOR CHANNELS

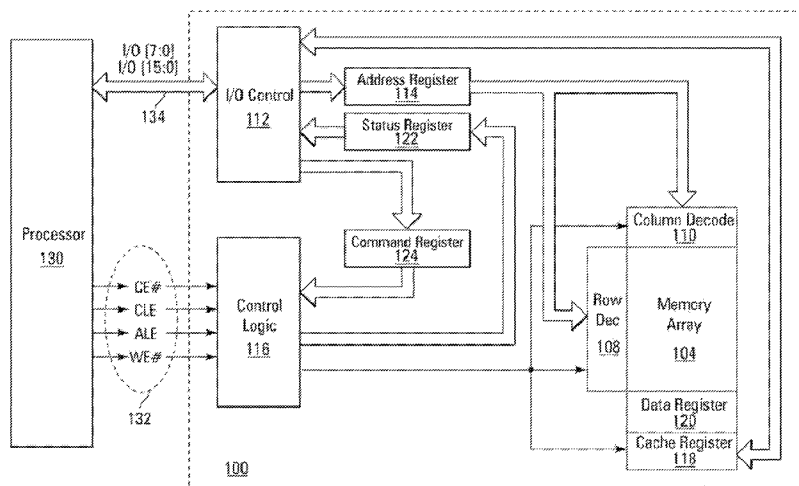


FIG. 1

(57) **Abstract:** Rigid semiconductor memory using amorphous metal oxide semiconductor channels are useful in the production of thin-film transistor memory devices. Such devices include single-layer and multi-layer memory arrays of volatile or non-volatile memory cells. The memory cells can be formed to have a gate stack overlying an amorphous metal oxide semiconductor, with amorphous metal oxide semiconductor channels.

WO 2010/096803 A3

A. CLASSIFICATION OF SUBJECT MATTER**H01L 21/8239(2006.01)i, H01L 21/8242(2006.01)i, H01L 21/8244(2006.01)i, H01L 21/8247(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)

H01L 21/8239; H01L 27/115; G02F 1/136; H01L 29/80; H01L 21/336; H01L 29/786; H01L 21/8247; H01L 21/00

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) & Keywords:"amorphous, metal oxide semiconductor, memory and the similar terms"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-0436654 B1 (JAPAN SCIENCE AND TECHNOLOGY AGENCY) 22 June 2004 See figures 1a, 1b, 5; page 3, line2- line42; page 4, line 23 ~line 38	1-3, 16-18
Y	JP 2007-123661 A (TOPPAN PRINTING CO LTD) 17 May 2007 See figure 1; paragraph [0018]~[0028]	1-3, 16-18
A	KR 10-2009-0006452 A (ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE) 15 January 2009 See figure 2; paragraphs [0023]~[0033]	1-3, 16-18
A	US 2008-0291350 A1 (HAYASHI RYO et al.) 27 November 2008 See figures 2-4; paragraphs [0032]~[0040]	1-3, 16-18
A	KR 10-2008-0048936 A (SAMSUNG ELECTRONICS CO., LTD.) 03 June 2008 See figure 1b; paragraphs [0017]~[0033]	1-3, 16-18

 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

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"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

"&" document member of the same patent family

Date of the actual completion of the international search

13 SEPTEMBER 2010 (13.09.2010)

Date of mailing of the international search report

13 SEPTEMBER 2010 (13.09.2010)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu,
Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KOO, Bon Jae

Telephone No. 82-42-481-8364



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.: 4-15, 19-21
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:

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 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/US2010/025034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-0436654 B1	22.06.2004	None	
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