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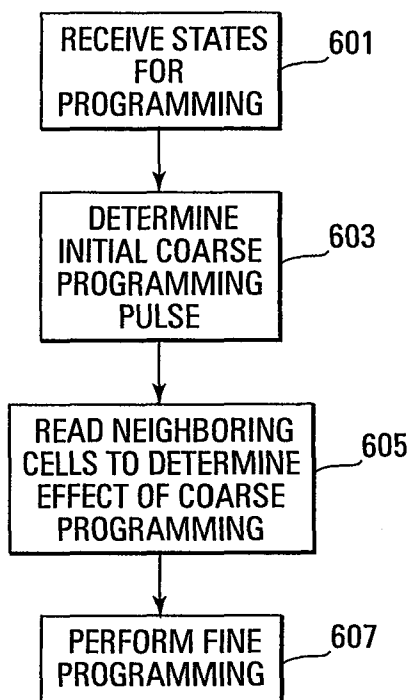
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- (71) Applicant (for all designated States except US): **MICRON TECHNOLOGY, INC.** [US/US]; 8000 South Federal Way, Boise, ID 83716 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **ROOHPARVAR, Frankie, F.** [US/US]; 16255 Ridgcrest, Monte Sereno, CA 95030 (US). **SARIN, Vishal** [US/US]; 20266 Vista Court, Cupertino, CA 94014 (US). **HOEI, Jung-Sheng**
- (74) Agent: **BOLVIN, Kenneth, W.**; Leffert Jay & Polglaze P.A., P.O. Box 581009, Minneapolis, MN 55458-1009 (US).
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[Continued on next page]

(54) Title: COARSE AND FINE PROGRAMMING IN A SOLID STATE MEMORY



**FIG. 6**

(57) Abstract: Memory devices adapted to receive and transmit analog data signals representative of bit patterns of two or more bits facilitate increases in data transfer rates relative to devices communicating data signals indicative of individual bits. Programming of such memory devices includes initially programming a cell with a coarse programming pulse to move its threshold voltage in a large step close to the programmed state. The neighboring cells are then programmed using coarse programming. The algorithm then returns to the initially programmed cells that are then programmed with one or more fine pulses that slowly move the threshold voltage in smaller steps to the final programmed state threshold voltage.

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**B. FIELDS SEARCHED**

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IPC 8 : G11C 7/10, G06F 12/06, H01L 27/115

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 since 1975  
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPONET internal) "memory, line, word, bit, bias, charge, voltage, SSD, cell, program"

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7158421 B2 (Yan Li et al.) 02 January 2007 See the abstract, claims 1, 2, 6, figures 8, 14, column 6 lines 41-61, column 15 lines 19-50	1-20
A	US 5295255 A (Kenneth A. Malecek et al.) 15 March 1994 See the abstract, claims 1-3, figures 2,3	1-20
A	KR 2006-0087447 A (Liaw Corvin) 02 August 2006 See the abstract, claims 1, 21, figure 4	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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Authorized officer

LEE, SANG MIN

Telephone No. 82-42-481-5734



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		EP 1686590 A3	11.04.2007