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61/177,900 13 May 2009 (13.05.2009) US(71) Applicant (for all designated States except US): **ADVANCED TECHNOLOGY MATERIALS, INC.** [US/US]; 7 Commerce Drive, Danbury, CT 06810-4169 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZHENG, Jun-Fei** [US/US]; 11 Sylvan Road South, Westport, CT 06880 (US). **ROEDER, Jeffrey, F.** [US/US]; 4 Longmeadow Hill Road, Brookfield, CT 06804 (US). **CHEN, Philip, S., H.** [US/US]; 26 Budd Drive, Bethel, CT 06801 (US).(74) Agent: **HULTQUIST, Steven, J.**; Intellectual Property/Technology Law, P.O. Box 14329, Research Triangle Park, NC 27709 (US).

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(54) Title: THE USE OF GE AS ISOLATION LAYER ON SBXTEY OR GEXTEY ALLOY TO PREVENT INTERACTION OF TE FROM SBXTEY AND GEXTEY RESULTING IN HIGH TE CONTENT AND FILM CRYSTALLINITY

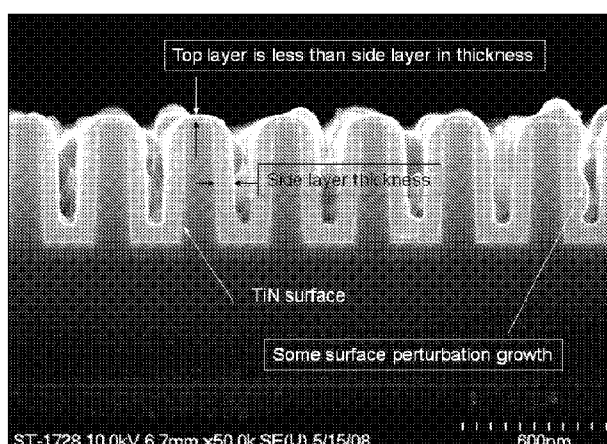


FIG.10

(57) Abstract: A multilayer film stack containing germanium, antimony and tellurium that can be annealed to form a GST product material of homogeneous and smooth character, wherein at least one antimony-containing layer is isolated from a tellurium-containing layer by an intervening germanium layer, and the multilayer film stack comprises at least two intervening germanium layers. The multilayer film stack can be formed by vapor deposition techniques such as chemical vapor deposition or atomic layer deposition. The annealable multilayer film stack can be formed in high aspect ratio vias to form phase change memory devices of superior character with respect to the stoichiometric and morphological characteristics of the GST product material.

A. CLASSIFICATION OF SUBJECT MATTER***H01L 27/115(2006.01)i, H01L 21/8247(2006.01)i, H01L 21/20(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 27/115; H01L 21/00; H01L 21/06; H01L 21/336; H01L 47/00

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 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)

eKOMPASS(KIPO internal) & Keywords: GST, phase change memory

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6872963 B2 (KOSTYLEV et al.) 29 March 2005 See abstract, fig 4A - 4C, column 5 line 9 - line 38	1-77
A X	US 6998289 B2 (HUDGENS et al.) 14 February 2006 See abstract, fig 1 - 6, column 2 line 20 - line 51	1-75,77 76
A	US 7029978 B2 (DODGE) 18 April 2006 See abstract, fig 1 - 3, column 1 line 56 - column 2 line 50	1-77
A	LEE J. et al, GeSbTe deposition for the PRAM application, Applied surface science, 2007, Vol.253, No.5, pages 3969~3976 See abstract	1-77



Further documents are listed in the continuation of Box C.



See patent family annex.

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

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Authorized officer

YEO, In Hong

Telephone No. 82-42-481-5673



INTERNATIONAL SEARCH REPORT

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