



US 20150214476A1

(19) **United States**

(12) **Patent Application Publication**
Matsui et al.

(10) **Pub. No.: US 2015/0214476 A1**

(43) **Pub. Date: Jul. 30, 2015**

(54) **SEMICONDUCTOR MEMORY**

Publication Classification

(71) Applicant: **Renesas Electronics Corporation,**
Kawasaki-shi (JP)

(51) **Int. Cl.**
H01L 45/00 (2006.01)
H01L 27/24 (2006.01)

(72) Inventors: **Yuichi Matsui,** Kawasaki (JP); **Nozomu Matsuzaki,** Kokubunji (JP); **Norikatsu Takaura,** Tokyo (JP); **Naoki Yamamoto,** Kochi (JP); **Hideyuki Matsuoka,** Tokyo (JP); **Tomio Iwasaki,** Tsukuba (JP)

(52) **U.S. Cl.**
CPC **H01L 45/06** (2013.01); **H01L 45/12** (2013.01); **H01L 45/1253** (2013.01); **H01L 45/1233** (2013.01); **H01L 27/2436** (2013.01)

(21) Appl. No.: **14/683,112**

(57) **ABSTRACT**

(22) Filed: **Apr. 9, 2015**

Related U.S. Application Data

(63) Continuation of application No. 13/493,442, filed on Jun. 11, 2012, now abandoned, which is a continuation of application No. 12/613,235, filed on Nov. 5, 2009, now Pat. No. 8,890,107, which is a continuation of application No. 11/596,220, filed on Nov. 14, 2006, now abandoned, filed as application No. PCT/JP05/08419 on May 9, 2005.

Foreign Application Priority Data

(30) May 14, 2004 (JP) 2004-144704

Manufacturing processes for phase change memory have suffered from the problem of chalcogenide material being susceptible to delamination, since this material exhibits low adhesion to high melting point metals and silicon oxide films. Furthermore, chalcogenide material has low thermal stability and hence tends to sublime during the manufacturing process of phase change memory. According to the present invention, conductive or insulative adhesive layers are formed over and under the chalcogenide material layer to enhance its delamination strength. Further, a protective film made up of a nitride film is formed on the sidewalls of the chalcogenide material layer to prevent sublimation of the chalcogenide material layer.

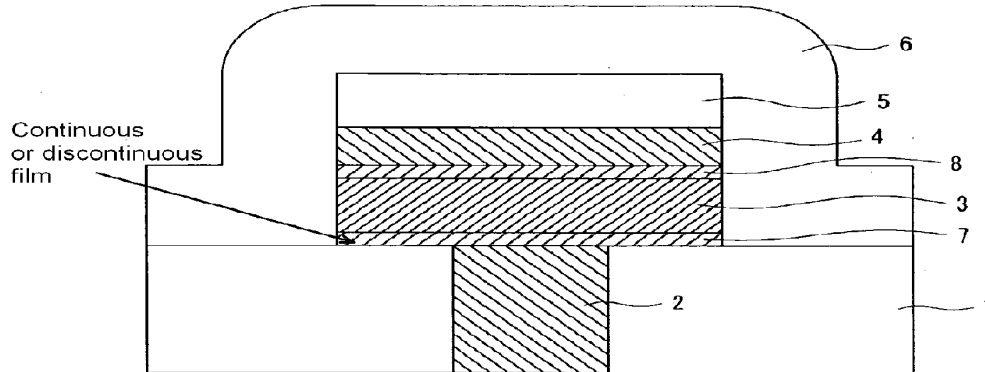


FIG. 1

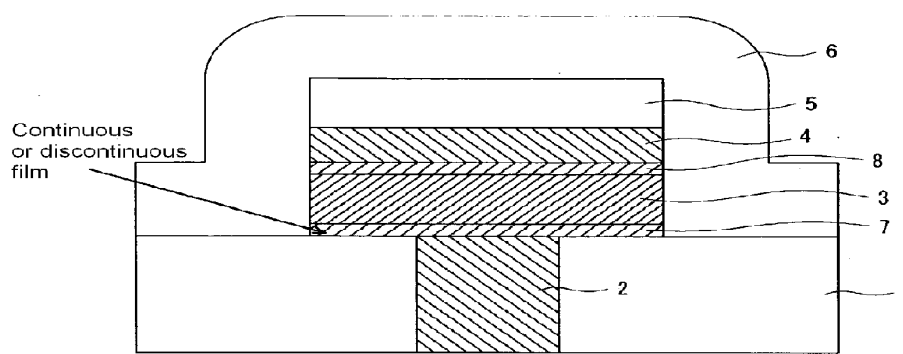


FIG. 2

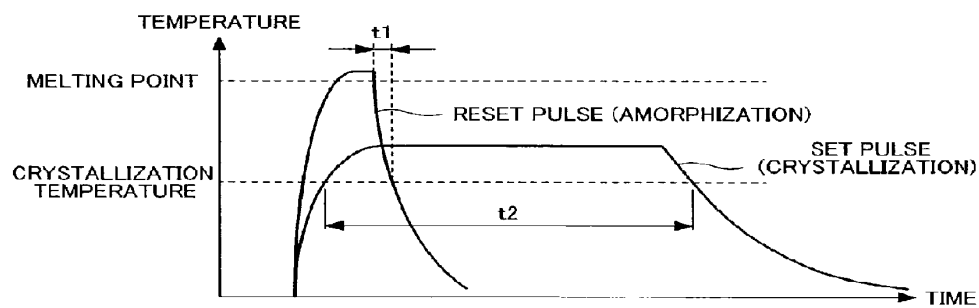


FIG.3

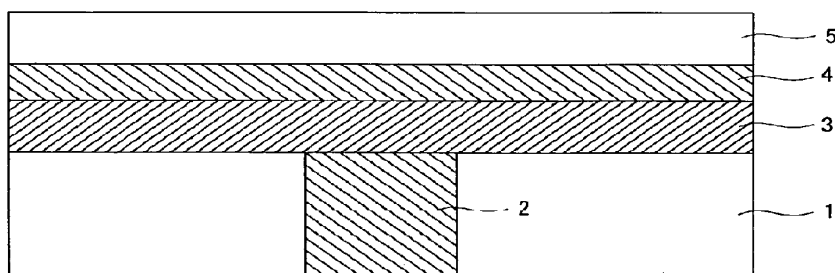


FIG.4

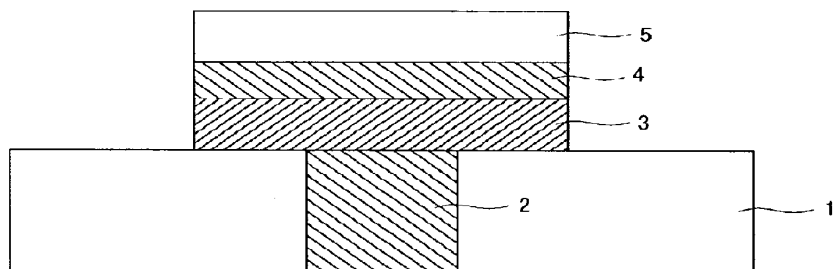


FIG.5

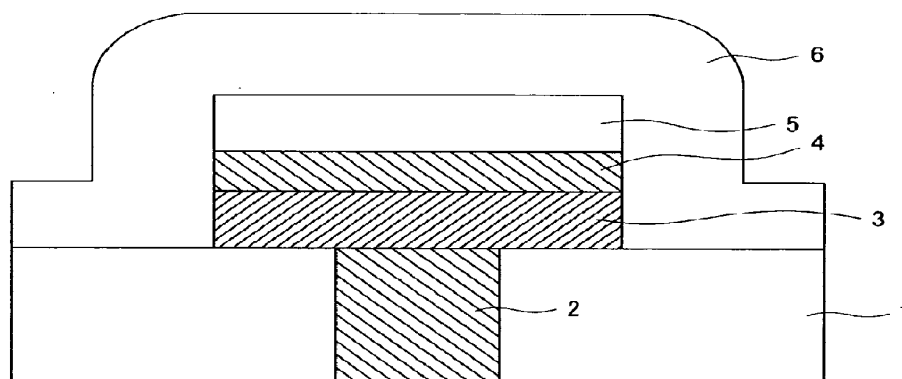


FIG.6A

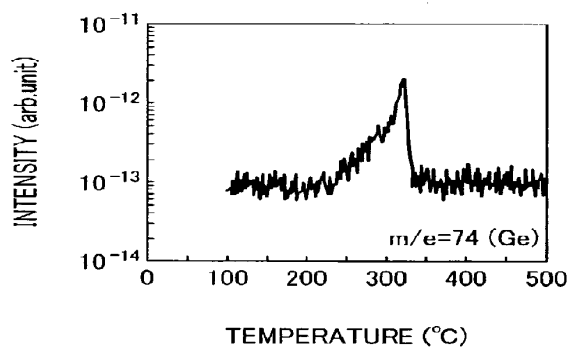


FIG. 6B

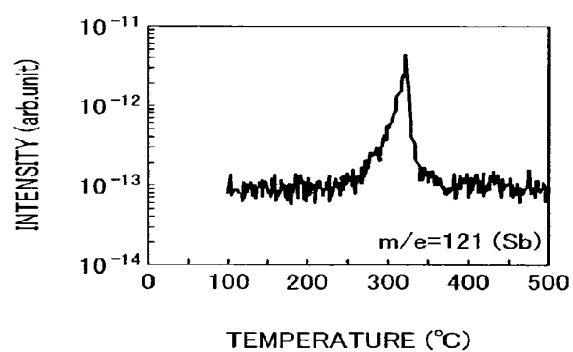
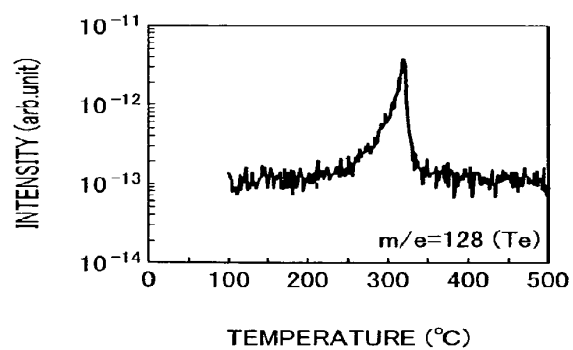


FIG. 6C



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.