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(54) Title: FORCED ION MIGRATION FOR CHALCOGENIDE PHASE CHANGE MEMORY DEVICE

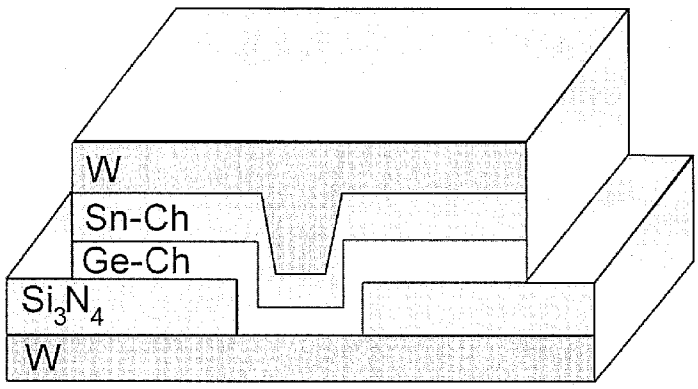

Fig. 3.

(57) Abstract: Non-volatile memory devices with two stacked layers of chalcogenide materials comprising the active memory device have been investigated for their potential as phase change memories. The devices tested include GeTe/SnTe, Ge2Se3/SnTe, and Ge2Se3/SnSe stacks, all of which exhibit resistance switching behavior. The polarity of the applied voltage with respect to the SnTe or SnSe layer was critical to the memory switching properties, due to the electric field induced movement of either Sn or Te into the Ge-chalcogenide layer. The devices exhibit phase change switching only after a reverse polarity voltage potential is applied across the stack causing ion movement into an adjacent layer and thus "activating" the device to act as a phase change random access memory device or a reconfigurable electronics device when the applied voltage potential is returned to the normal polarity. The devices may be capable of exhibiting more than two data states.

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