ABSTRACT

LAYERED RESISTANCE VARIABLE MEMORY DEVICE AND METHOD OF FABRICATION

The invention is related to methods and apparatus for providing a resistance variable memory element with improved data retention and switching characteristics. According to the invention, a resistance variable memory element is provided having at least one metal containing layer (18), preferably a silver-selenide layer, in between two chalcogenide glass layers (17, 20), preferably having Ge_xSe_{100-x} composition, and top and bottom electrodes (14, 22). A metal layer (50), preferably a silver layer, is provided above at least the second chalcogenide glass layer (20) and a conductive adhesion layer (30) is disposed above said silver layer. According to another embodiment of the invention, a resistance variable memory element is provided having a first chalcogenide glass layer (17), a silver layer (40') over said first chalcogenide glass layer, a silver selenide layer (18) over said silver layer, a second chalcogenide glass layer (20) over said silver selenide layer, and optionally a second silver layer over said second chalcogenide glass layer.

FIG.11

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