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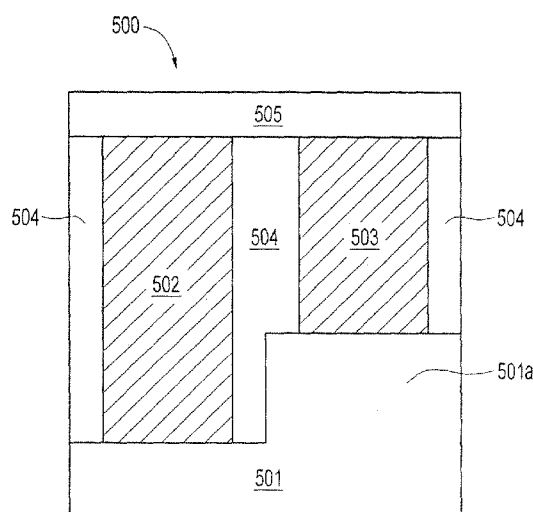


FIG. 5A

(57) Abstract: A phase change memory structure with multiple resistance states and methods of forming, programming, and sensing the same. The memory structure includes two or more phase change elements provided between electrodes. Each phase change element has a respective resistance curve as a function of programming voltage which is shifted relative to the resistance curves of other phase change elements. In one example structure using two phase change elements, the memory structure is capable of switching among four resistance states.

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