ABSTRACT

A memory device including: a memory cell array, including a memory cell having a switch element and a data storage element connected to the switch element, wherein the data storage element has a phase change material; and a memory controller for inputting a first read current to the memory cell to detect a first read voltage, inputting a second read current to the memory cell to detect a second read voltage, and inputting a compensation current to the memory cell, wherein the compensation current lowers a resistance value of the data storage element, the compensation current is input when a first state of the memory cell is different from a second state of the memory cell, the first state is determined using the first read voltage and the second state is determined using the second read voltage.

FIG. 1