# Metal Oxide Resistive Memory Modeling with Physical Current Equation

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**Abstract**

In this paper, DC compact model of a resistive-switching random-access memory (ReRAM) has been characterized and developed. ReRAM is one of the types of nonvolatile memory that is a promising candidate for use in the future. It is currently being actively studied for use in fields such as neuromorphic and AI computing due to its advantages such as fast switching speed and low operating voltage. Since the use of ReRAM in this field is used as a large-scale array simulation, a compact model is required to confirm the operation characteristics. The compact model was calibrated based on the measured values of two actually fabricated ReRAM devices using HfOx and SiNx materials as switching layers. In addition, this compact model was written using Verilog-A so that it can be directly applied to SPICE simulation. We have seen that it is possible to have a compact model with high accuracy for with different switching layers ReRAM devices when adjusting the parameters in current density equations and fitting parameters.

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