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**A VDTA-Based Robust Electronically Tunable Memristor Emulator Circuit**

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**Abstract**

In this paper, a fully-integrated tunable grounded memristor emulator circuit based on voltage differencing transconductance amplifier (VDTA) has been proposed. The proposed memristor emulator circuit utilizes two VDTA active building blocks, two grounded resistors, a grounded capacitor and a four-quadrant analog multiplier. The working concept along with the detailed derivation of the mathematical model of the circuit has been discussed numerically and analytically to validate the operation of the proposed emulator. The operations of the proposed emulator circuit, as governed by the established model, have been verified by performing simulations in Cadence Virtuoso at 45 nm technology node. Robustness analyses performed, reveal significant process-variation tolerance at deep sub-micron technology node.

**Keywords:**

Voltage differencing transconductance amplifier, Memristor emulator, Memductance, Robustness

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