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High performing resistive switching technology

A novel and promising approach to low energy neuromorphic computing

Technology

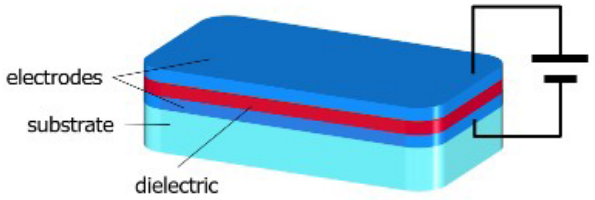
Low temperature deposition of uniform layers of doped-HfO_x enables a new approach to low energy neuromorphic computing and non-volatile memory storage.

Benefits

- Amorphous nanocomposite thin film deposited under CMOS-compatible temperatures.
- Significantly better reliability and more readily scaled than filament-based resistive switching devices.
- Very low cycle-to-cycle, device-to-device and sample-to-sample variability.
- Switching endurances >10^4 cycles and switching times ~20 ns.
- Switching voltages of ±2.0 V, approach those of DDR SDRAM.

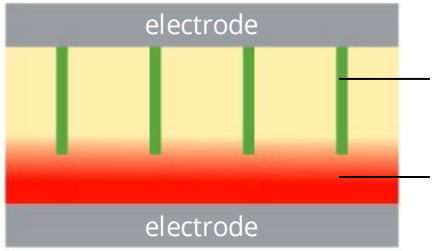
Commercial applications

- Potential to replace current flash memory technologies and to produce neuromorphic computing devices for, e.g., energy-efficient artificial intelligence applications.



Resistive switching (RS) occurs when a dielectric material undergoes a rapid and non-volatile change from high to low resistance or vice versa.

Pre-defined conducting channels produced by doping HfO_x allows >500 resistive states



Pre-defined partial channels

Oxygen vacancy concentration

Opportunity

We are seeking partners to help advise, scale and prototype this technology.

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