

BioReRAM™

Non-volatile resistive random-access memory and a manufacturing method

“Memory made green.”

Technology

BioReRAM™ is a novel non-volatile Resistive Random-Access Memory (ReRAM) technology that utilises a bio-based switching/active layer made from milk or a milk-based emulsion. The resistive switching layer, located between two electrodes, contains lactose, fat, protein, and water - components naturally present in cow milk. This bio-based layer enables data storage by switching between high and low resistance states under applied voltage, functioning similarly to traditional ReRAM devices but with eco-friendly and cost-effective materials. The technology leverages the intrinsic electrical properties of milk constituents to facilitate resistive switching, offering a sustainable alternative to conventional ReRAM materials.

Market need

Conventional ReRAM devices rely on expensive, complex, or environmentally challenging materials for the switching layer, limiting scalability and sustainability. With increasing global demand for green electronics, flexible devices, and cost-effective memory solutions, there is a growing market need for non-volatile memory systems that are high-performance, sustainable, and affordable. BioReRAM™ addresses this need by providing a bio-based, low-cost alternative suitable for next-generation consumer electronics, IoT devices, wearable technology, and flexible electronics.



Features

- Uses bio-based materials (milk) as the resistive switching layer.
- Low-cost raw materials compared to traditional inorganic or synthetic ReRAM layers.
- Reduces reliance on rare or environmentally harmful materials.
- Versatile fabrication.



Benefits

- Minimises environmental impact by utilising milk-based biomaterials.
- Reduces material costs, making non-volatile memory more accessible for diverse applications.
- Retains resistive switching capabilities comparable to conventional ReRAM devices.
- Applicable in consumer electronics, IoT, flexible displays, wearable electronics, and other memory-intensive applications.



Industry

ICT

Potential applications

- Next-generation memory devices for consumer electronics, IoT systems, and wearable technology.
- Eco-friendly and flexible electronics requiring sustainable and biodegradable components.
- Data storage in low-power devices such as sensors, smart textiles, and medical wearables.
- Green semiconductor manufacturing reducing reliance on rare or toxic materials.
- Educational and research tools for exploring bio-based computing and sustainable electronics.

Creators

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Stage of development

Early stage

Intellectual property

Patent Protection

Desired relationship

Co-development, Investors