

ChitoMem™

Biodegradable Transparent Polymer ReRAM Device

“Memory that biodegrades.”

Technology

ChitoMem™ is an innovative biodegradable and transparent resistive random-access memory (ReRAM) device that delivers exceptional resistive switching behaviour (>7 orders of magnitude) while operating at low power. The technology is based on a chitosan-derived polymer composite integrated with aluminium-incorporated zinc oxide (Al–ZnO) nanoparticles, resulting in a film that is biodegradable, transparent, and cost-effective to produce.

Using a simple, scalable fabrication process, ChitoMem™ enables the production of environmentally sustainable ReRAM chips that align with global electronic waste reduction goals and the transition toward eco-friendly, next-generation electronics. This innovation bridges the gap between high-performance electronics and environmental responsibility.

Market need

ReRAM has overcome the challenges faced by DRAM and SRAM, of content loss, by using materials that change resistance in response to voltage. This means that the memory device has good scaling behaviour, which will not result in memory loss in the event of power cuts. However, despite their unique features, the use of these non-biodegradable (inorganic) materials leads to an increase in electronic waste, which is an environmental hazard. Therefore, there is a need to develop an environmentally friendly product with comparative efficiency to reduce electronic waste.



Features

- Chitosan aluminium zinc oxide single-layer biopolymer material
- High-performance parameter
- Two-terminal structure (reduces the amount of hardware required)



Benefits

- Biodegradable and transparent electronic memory device
- High resistive switching ratio ($>10^7$) with low operating power
- Scalable and affordable fabrication using green materials
- Reduces e-waste and supports sustainable electronics development
- Commercially viable for integration into emerging green tech markets



Industry

ICT

Potential Applications

- Next-generation biodegradable electronics and memory devices
- Flexible and transparent electronic systems
- Sustainable consumer electronics manufacturing
- Green IoT and wearable technology platforms

Creators

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Stage of Development

Prototype

Intellectual Property

Patent Protection

Desired Relationship

Co-development investor