Z2RAM: AI’s New Memory Layer

A breakthrough in stacking could unlock faster, denser memory for AI chips.

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THE DATA

185 megabits per square millimeter

Target Z2RAM Density

This density represents a fivefold improvement over conventional SRAM.

Z2RAM's stacked architecture enables significantly higher memory density without sacrificing speed. By using two transistors per cell and stacking up to six layers, the technology achieves a theoretical density five times greater than standard SRAM—without requiring a new fabrication process. This leap is critical for AI workloads that demand both high bandwidth and low latency.

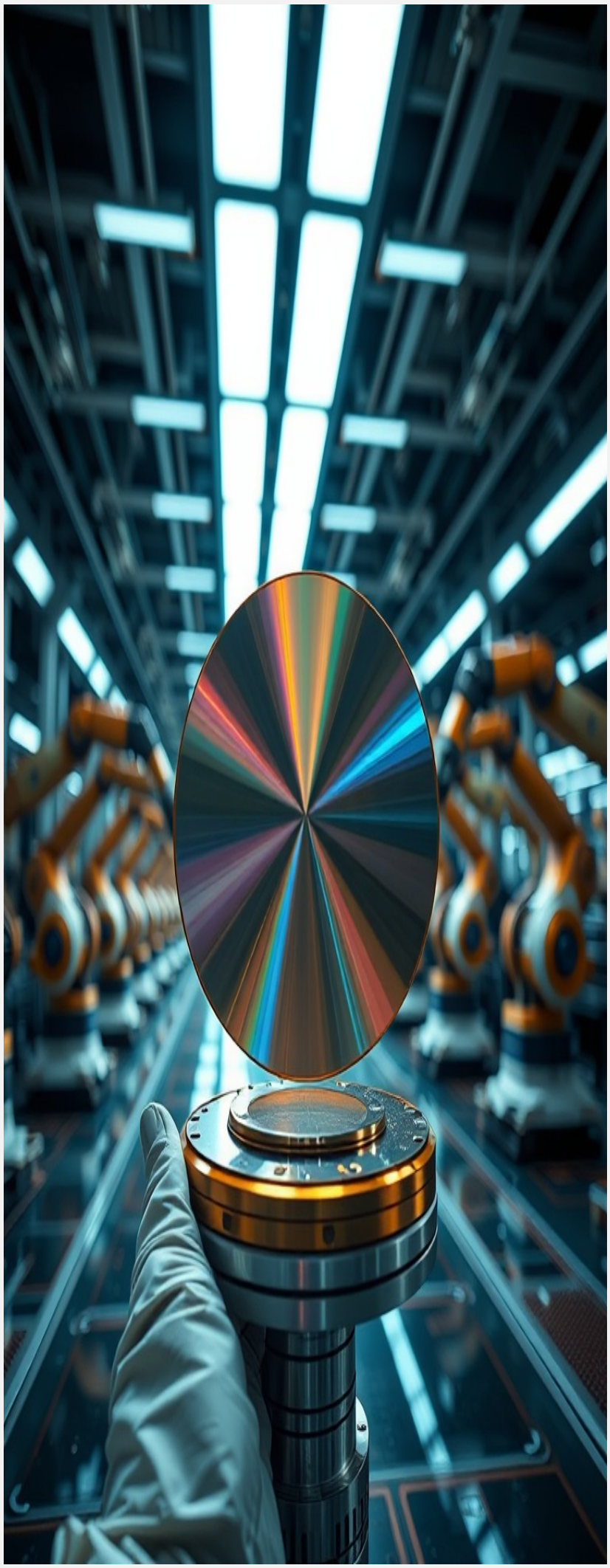


Source: IEEE Spectrum · Published November 29, 2026
https://spectrum.ieee.org/sram-memory-z2ram

01

Stacking > Shrinking for AI Memory

Instead of relying on shrinking transistor sizes—a path now hitting physical limits—Z2RAM leverages vertical stacking to boost density. This shift redefines the memory roadmap, moving from horizontal scaling to 3D integration. For AI accelerators, where data movement is a major bottleneck, this architecture could drastically reduce latency while maintaining signal integrity through amplified read transistors.



02

Speed Meets Stability

However, stability challenges remain, particularly threshold voltage drift under thermal stress. The solution lies in proprietary oxide semiconductors and a metal shield within each cell, which reduces interference but increases cell width. This trade-off is being offset by vertical stacking, demonstrating that reliability and density can co-evolve in next-gen memory.

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