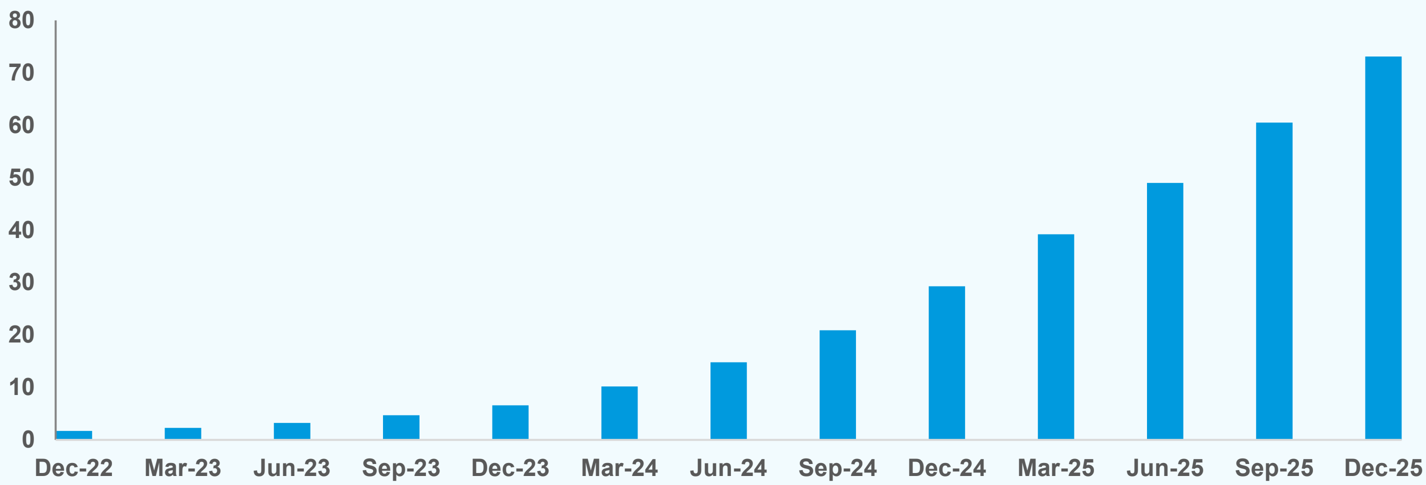
AI's Insatiable Appetite for Memory

The artificial intelligence (AI) buildout conversation tends to focus on processors, Nvidia's GPUs and custom silicon from the hyperscalers, amid the relentless push for more compute. But a structural shift is underway in a less visible part of the semiconductor supply chain. At the center of it is a shortage of dynamic random access memory (DRAM), a device's short-term working memory where data is processed in real time. What's driving this shortage, and what types of companies could potentially benefit?

Cumulative Memory Bandwidth Shipped (millions of TB/s)



Source: Epoch AI as of March 2026.

- When hundreds of millions of users interact with AI models like ChatGPT, each conversation requires real-time access to massive amounts of data. The longer the interaction, the more data must flow between memory and processor, straining what's known as memory bandwidth — and every AI chip has a limit on how much it can handle. In the chart above, by December 2025 the total bandwidth associated with every AI chip shipped worldwide summed to roughly 70 million terabytes per second, a 40X increase since the launch of ChatGPT.
- Because conventional DRAM can't deliver the bandwidth needed for AI workloads, chip designers have turned to high-bandwidth memory (HBM), an advanced form of memory that delivers far greater throughput by stacking memory chips in layers. But HBM is significantly more complex and supply-constrained. Memory providers have reallocated manufacturing capacity toward HBM and are locking in multi-year supply agreements. Given that HBM remains scarce and expensive, demand has risen for other forms of memory such as flash storage as companies redesign systems to distribute data across cheaper alternatives.
- We believe this dynamic reinforces an important lesson from previous technological revolutions: some of the most valuable parts of the supply chain are often the bottlenecks. Just as GPUs have emerged as the essential foundation of AI, memory may become equally indispensable to enabling the next phase of AI computing. In our view, companies across the memory and storage hierarchy, from HBM suppliers to flash and hard drive manufacturers, may be well positioned for long-term growth as AI adoption expands and demand for faster data processing continues to accelerate.

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