

IS THIS THE END OF MEMORY AS WE KNOW IT?

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MEMPHIS
MEMORY
ESSENTIALS

Everything you need to know about the semiconductor memory industry, from legacy technologies to latest innovations.

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Is this the end of Memory as we know it?

Looking at market figures, it seems that we are at a tipping point in the memory market. The big memory manufacturers are focusing on the development of High Bandwidth Memory (HBM) which is a novel technology that integrates DRAM directly onto GPUs or CPUs – a completely different approach compared to traditional memory architectures. And this cannot be replicated or copied by any of the smaller memory manufacturers any time soon.

The efforts to move to scale this new, lucrative memory technology are far higher than with previous DRAM developments. This requires more focus which automatically results in less attention to older memory technologies. As we see it, the big manufacturers are going all in on HBM. Not surprisingly, as HBM will account for 5% of DRAM bit shipments but a staggering 20% of revenue in 2024, according to [TrendForce](#).

The trend is similar in Flash memory, where QLC NAND for high-capacity SSDs will see 20% of NAND bit shipments in 2024 driven by AI servers.

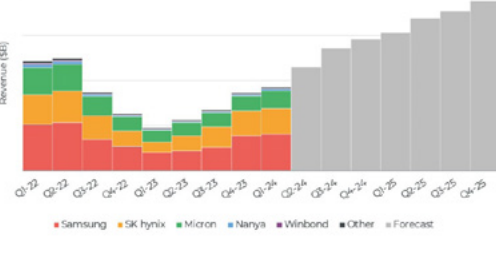
This means that discontinuations of older DRAM generations like DDR3 and DDR4 are coming from the big three memory manufacturers. Flash memory technologies are also likely to see reduced investment over time as the industry focuses on next-generation memory solutions.

In essence, the gap between cutting-edge memory and established DRAM and flash memory solutions is widening and the alternatives are narrowing.

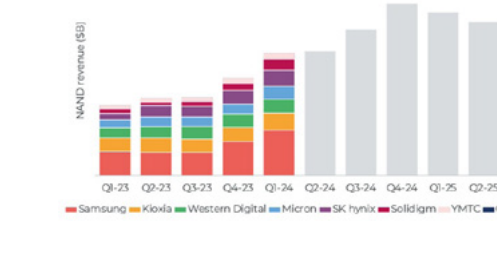
The good news is that there are still manufacturers committed to longevity!

Get in touch with us to assess your long-term memory needs.

2022-2025 DRAM quarterly revenue by supplier
(Source: DRAM Market Monitor Q2 2024, Yole Intelligence, June 2024)



2023-2025 NAND quarterly revenue by supplier
(Source: NAND Market Monitor Q2 2024, Yole Intelligence, June 2024)



DRAM Back to Growth

According to the DRAM Market Monitor, Q2 2024 from Yole Group the DRAM market is experiencing a broad recovery across all technologies. In Q1 2024, the industry's average operating margin reached 18%, with Samsung, SK Hynix, and Micron all reporting profitability.

DRAM suppliers are reversing fab utilization cuts to meet the growing demand from OEMs and data center operators. Additionally, DRAM demand is set to benefit over the next 18 months from a wave of COVID-era PCs that are now becoming candidates for replacement.

Read the full press release [here](#).

NAND Headed for Undersupply

Q1 2024 saw a significant demand surge in the enterprise SSD segment, with memory suppliers experiencing ~26% QoQ growth in shipments according to the quarterly NAND Market Monitor from Yole Group.

CAPEX for NAND is expected to remain low in 2024, similar to 2023 levels. As a consequence of this limited investment, the installed wafer capacity by early 2025 is projected to be reduced in comparison to the pre-production cut capacity.

Despite suppliers starting to increase their capacity utilization rate, the market is expected to be undersupplied throughout 2024.

Read more [here](#).

DRAM & NAND
Prices Increase
15 ~ 20 %

Largest Growth since April 2022



Largest Semiconductor Growth since April 2022

The global semiconductor industry sales hit \$49.1 billion during the month of May 2024, an increase of 19.3% compared to the May 2023 total of \$41.2 billion and an increase of 4.1% compared to the April 2024 total of \$47.2 billion.

The industry has shown growth every month of 2024, however, May shows the largest percentage growth since April 2022, according to WSTS. Since memory prices are now set to increase as well, this upward trend is likely to continue.

Read more [here](#).

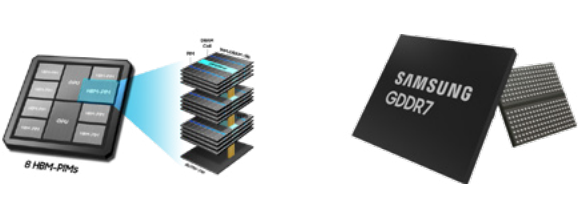
Price Increases for DRAM and NAND

Samsung Electronics plans to raise prices for server DRAM and enterprise NAND flash by 15% to 20% in the third quarter. At the same time, the three major manufacturers focus on developing high-bandwidth memory (HBM), which limits the output of DDR4 and DDR3.

Furthermore, data from [DRAMeXchange](#) shows, the global sales of enterprise NAND flash reached \$3.758 billion in the first quarter of this year, marking a 62.9% increase from the previous quarter. With the rising demand, some products are experiencing shortages.

Read more [here](#).

HBM vs GDDR7



Who's the Bigger Memory Driver?



100% RoHS DDR5 Modules from IM

Intelligent Memory Ltd. has introduced DDR5 modules meaning that are fully RoHS-compliant. You might ask, why the fuss? RoHS has been around for a while, but most DRAM modules use exemptions as not all harmful substances could be replaced just yet.

IM's DDR5 memory modules use less than 0,01% of lead or other harmful substances and come in 16 and 32 Gigabyte capacities, 5600 MHz clock frequency and in SO-DIMM, UDIMM and RDIMM form factors.

Read more [here](#).

HBM Contender GDDR7

The AI wave is reshaping the memory market dynamics, with HBM leading the charge and GDDR7 emerging as a formidable contender. While HBM faces significant technical barriers and cost challenges, GDDR7 offers a promising alternative for smaller industrial applications seeking high bandwidth and throughput.

Expected to enter mass production later this year, GDDR7 has the potential to drive innovation in the memory industry and fuel new AI applications.

Explore more insights [here](#).



Tackling Data Retention in SSDs

SSDs have conquered the market due to their speed, durability, energy efficiency and small form factor. However, write endurance and data retention are concerns in embedded and industrial applications, especially as the technology moves to ever smaller nodes.

Two key factors affect data retention, the period over which flash memory can store data without loss or corruption, in NAND flash cells: program/erase (P/E) cycling and operating temperature.

More about why and how this matters [here](#).



Summer Party Celebrating our Office Opening

MEMPHIS turned 33 earlier this year and since we had moved to a new office in winter, we took the opportunity to combine our summer party with birthday and office opening celebrations.

Thanks to beautiful weather we were able to enjoy a lovely barbeque with employees and friends in the garden of our new office.

Haven't updated your records with our new address yet? Then now is the time to do so. Or drop by for a visit when you are near.

You can find us [here](#).

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