ARE WE FACING A MEMORY DIVIDE?

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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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Are we facing a Memory Divide?

Without a doubt, AI is the hype topic in technology at the moment. It's significantly shaping and driving memory development as the focus is on high-speed, high-bandwidth and low-power memory technologies. Among these, it's particularly HBM that is getting a lot of attention. Yole Group predicts impressive growth rates in HBM for 2024 and this is just the beginning, as the major memory players Samsung, Sk hynix and Micron are ramping up their HBM3 memories this year.

Demand is high and supply comes only from a limited number of suppliers, and this has never been a good market condition for industrial customers. Not only is HBM a specialized product, it also requires its own logic, which makes it even more difficult to reach a volume to make it worthwhile for the big three players. So we are seeing a memory divide looming, where industrial applications that require high-bandwidth memory need to be creative and find workarounds for the time being as they simply won't be able to get HBM. This is a topic that Neumonda is following at the moment, so reach out if you are in this situation, reach out.

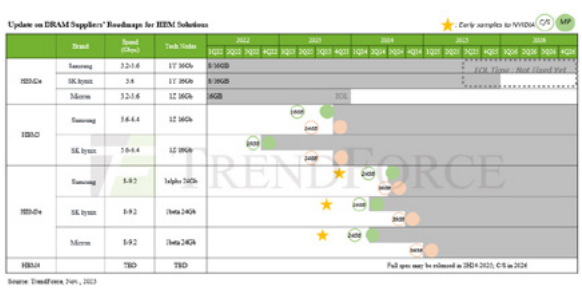
But even if you do not require high-end memory, you should still keep an eye out on what's happening in the market. Although prices are starting to rise, manufacturers are still cautious about ramping up production of standard components. It's also not clear if or rather which memory products they are going to discontinue to free capacity for new technologies.

So ask yourself: Do you have the memory products that you need for this year?

Mark your calendar for embedded world 2024 (April 9 to 11) that's a good time to meet in person and discuss your upcoming projects and need.

HBM Revenue up 150%?

HBM Roadmaps of the Big 3



HBM Revenue up 150%?

According to Yole Group, HBM will largely outgrow the overall DRAM market driven by the strong demand for AI. After impressive bit-shipment growth in 2023 (+93% YoY), HBM bits are expected to continue growing vigorously in 2024 (+147% YoY) and throughout the next five years (~45% CAGR23-29). By comparison, data center DRAM bits will have a ~25% CAGR23-29.

In terms of revenue, the HBM market has the potential to grow from ~$2.7B in 2022 to ~$14B in 2024, corresponding to ~3% and ~19%, respectively, of the overall DRAM revenue.

Read more here.

HBM Roadmaps

According to TrendForce, the mainstream HBM in the market in 2023 was HBM2e. To meet the evolving demands of AI accelerator chips, manufacturers like Sk hynix, Samsung Semiconductor and Micron Technology are planning to launch new products like HBM3e in 2024, expecting HBM3 and HBM3e to become the market norm.

Trendforce has captured the timeline of the big 3 memory manufacturers in a roadmap that shows that the higher-spec HBM4 is expected to launch in 2026.

Read more about it here.

AI´s Rocketing Demand Drives Server DRAM Groth

YoY Growth Rate of Content per Box for DRAM & NAND Flash in Top Three Applications, 2023–2024

Application	DRAM		NAND Flash	
	2023	2024(E)	2023	2024(E)
Smartphones	17.5%	**14.1%**	19.2%	**9.3%**
Servers	13.6%	**17.3%**	14.9%	**13.2%**
Notebooks	9.0%	**12.4%**	10.1%	**9.7%**

Source: TrendForce, Feb., 2024

Price Rally for DRAM and Flash to Continue into 4Q2024

QoQ Changes in DRAM and NAND Flash ASPs (Overall Average Contract Prices), 1Q24-4Q24

	1Q24(E)	2Q24(F)	3Q24(F)	4Q24(F)
Blended DRAM	up 13~18%	up 3~8%	up 8~13%	up 8~13%
Blended NAND Flash	up 18~23%	up 3~8%	up 8~13%	up 0~5%

Source: TrendForce, Jan., 2024

AI Drives Server Growth

According to TrendForce Corporation, the continued rollout of advanced #AI chips is driving growth in #DRAM and #NAND #flashmemory across various AI applications, including smartphones, servers, and notebooks in 2024. The server sector is expected to see the most significant growth, with content per box for server DRAM projected to rise by 17.3% annually, while enterprise SSDs are forecast to increase by 13.2%.

The market penetration rate for AI smartphones and AI PCs is expected to experience noticeable growth in 2025 and is anticipated to further drive the average content per box upward.

Read the full story here.

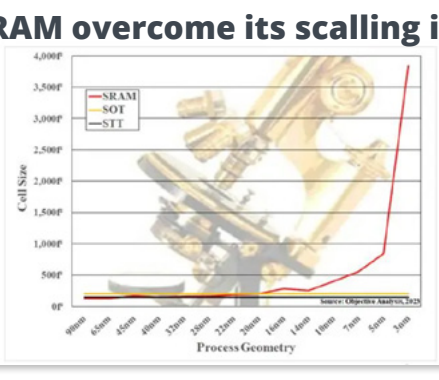
Price Rally for DRAM and Flash to Continue Throughout 2024

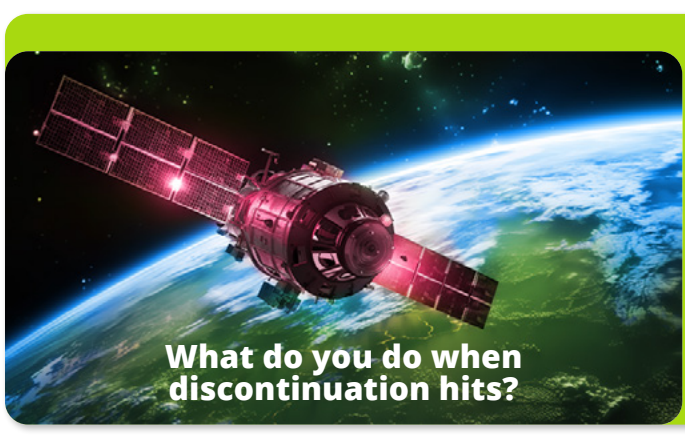
TrendForce Corporation confirmed its initial projections for the first quarter of 2024: a hike of around 13-18% QoQ for #DRAM contract prices and a hike of 18-23% for #NAND Flash contract prices. This not only ends an 8-quarter price decline, but TrendForce thinks price increases will sustain throughout 2024.

The quarter-on-quarter percentage increases mean that DRAMs might cost at least 36 percent and NAND at least 31 percent more at the end of the year than today.

Read more here.

Can SRAM overcome its scalling issues?





Can SRAM overcome its scaling issues?

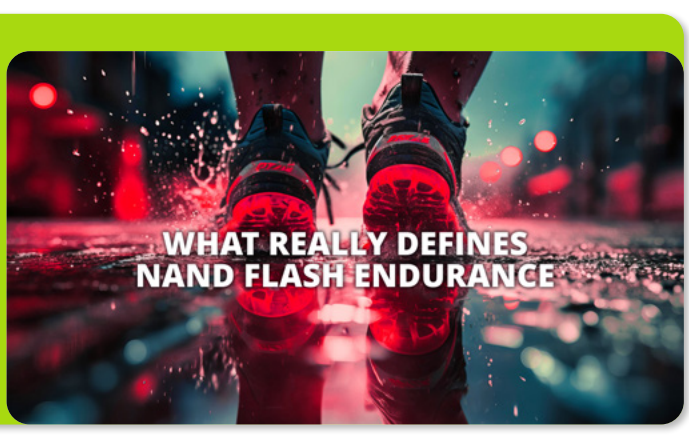
For over 60 years SRAM has remained the memory of choice in applications where lower latency and reliability are prioritized. But when it comes to keeping pace with CMOS scaling, SRAM has fallen flat, with consequences for power and performance. In fact, as far back as 20nm, SRAM's inability to scale commensurately with logic portended that there would be power and performance challenges when on-chip memory could become bigger than the chip itself. In response to such issues, both system designers and hardware developers are applying new solutions and developing new techniques.

Read more here.

3D Plus Case Study

What happens if your memory product isn't available anymore in the market from any vendor, but you can't just move to a new technology? Our customer 3D PLUS faced exactly this situation when the 8Gigabit DDR3 x32 DRAM component it was using for avionic and aerospace applications was discontinued. When they ran out of options, they turned to MEMPHIS for help and we brought in experts from various fields to solve their issue. Simply put, we proved that we are not a mere distributor, we are a memory competence center.

Check it out here.



Hall 1 Booth 340

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How long will your Flash memory live?

What determines the lifetime of a flash memory? Usually program/erase (P/E) cycles are taken as indicators for endurance. However, much the same as the miles per gallon number are an unattainable fuel efficiency figure, the manufacturer's P/E figure can never be reached in practice. In this video, Intelligent Memory describes the factors that influence the endurance and performance of a NAND flash memory.

Check it out here.

Meet us at embedded world 2024

From April 9th to 11th, embedded world 2024 opens its doors again in Nuremberg. You can find us in our usual spot in hall 1, booth 340 where we will show highlights from selected manufacturers as well as our latest range of MEMPHIS configured modules. So book a meeting with us at embedded world today and redeem your entry ticket for the show with this code: ew24517722

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