

PRICES FALL AND PIGS FLY?

NO.8 SEPT23 MEMPHIS MEMORY ESSENTIALS

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

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Prices Fall and Pigs Fly?

Time flies! We are in September. School has started again, and leaves are beginning to fall, but memory prices do not. At least not any longer. Just as we estimated at the beginning of the year.

Why? Because manufacturing output is still low – according to TrendForce Samsung cut back NAND production by as much as 50% in September - and this inventory clean-up is taking effect. Trendforce expects a mild price surge of 5% in NAND for Q4 2023. But looking at the demand side for 2024, Trendforce anticipates Year-over-Year bit demand growth rates for DRAM and NAND Flash of 13% and 16%, respectively.

So if you are still hoping memory prices keep falling or even stay this low for much longer, then you might wait for pigs to fly. Yes, we cautioned to be careful with this term when it comes to semiconductor innovation (if you missed it, read about it [here](#)). Who would have thought that DDR5 would come in 32Gb so soon? Or LPDDR4x would become so successful?

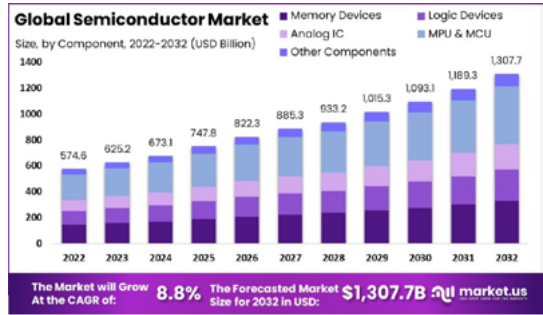
But when it comes to memory market development and prices, we are quite confident we are right. After all, we know memory.

NAND Flash Prices to Stabilize & Rebound in Q4

2023 Price Projections for NAND Flash

QoQ %	1Q23	2Q23	3Q23E	4Q23F
Total NAND Flash	down 10-15%	down 10-15%	down 5-10%	up 0-5%

Source: TrendForce, Sep., 2023



NAND Prices to Rebound in Q4

According to a recent Trendforce research, Samsung has taken a decisive step: a sweeping 50% production cut from September, with the focus mainly on processes under 128 layers.

TrendForce expects other suppliers to follow suit and increase their production cutbacks in the fourth quarter to accelerate inventory reduction. Against this background, Q4 NAND Flash average prices are projected to either hold firm or witness a mild surge, possibly in the ballpark of 0-5%.

Aligning with TrendForce's early-year forecasts, NAND Flash prices are poised to rally ahead of DRAM. Yet, for this positive price trajectory to sail smoothly into 2024, a sustained curtailing in production and a robust rebound in enterprise SSD purchase orders are pivotal.

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

Memory leads Global Semiconductor Market Growth

According to Market.us, The Global Semiconductor Market is projected to reach a valuation of USD 1,307.7 Bn by 2032 at a CAGR of 8.8%, from USD 574.6 Bn in 2022. The growth of the market is being driven by the increasing demand for semiconductors in a variety of end-use applications. Here are some key takeaways from the semiconductor market:

- The memory devices segment is expected to lead the market during the forecast period.
- The automotive segment is expected to be the fastest-growing market during the forecast period.
- The key challenges facing the semiconductor market include the shortage of skilled workers, the rising cost of manufacturing, and the increasing complexity of semiconductor designs.

Find out more [here](#).

DRAM and NAND Flash Supply/Demand Bit Growth, 2020-2024

		2020	2021	2022	2023F	2024F
DRAM	Supply Bit Growth	14.2%	18.2%	18.7%	-2.1%	11.1%
	Demand Bit Growth	-15.7%	-20.8%	11.9%	6.4%	13.0%
NAND Flash	Supply Bit Growth	31.4%	39.4%	29.8%	2.3%	3.6%
	Demand Bit Growth	29.4%	39.7%	19.2%	11.0%	16.0%

Note: This estimate is based on reduced production from select suppliers. Source: TrendForce, Aug., 2023



DRAM and NAND Bit Demand Increases

TrendForce expects that memory suppliers will continue their strategy of scaling back production of both DRAM and NAND Flash in 2024, with the cutback being particularly pronounced in the NAND Flash sector.

Market demand visibility for consumer electronic is projected to remain uncertain in 1H24. Additionally, capital expenditure for general-purpose servers is expected to be weakened due to competition from AI servers.

Considering the low baseline set in 2023 and the current low pricing for some memory products, TrendForce anticipates for 2024 YoY bit demand growth rates for DRAM and NAND Flash to be 13% and 16%, respectively.

Nonetheless, achieving effective inventory reduction and restoring supply-demand balance next year will largely hinge on suppliers' ability to exercise restraint in their production capacities. If managed effectively, this could open up an opportunity for a rebound in average memory prices.

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

Emerging Non-Volatile Memories Branch Out

Magnetic RAM (MRAM) and spin transfer torque RAM (STT MRAM) are starting to replace some NOR flash and SRAM and could possibly displace some DRAM within the next few years. The rate of development and increasing product volume in STT MRAM and other MRAM technologies will gradually result in lower prices according to the 2023 report on emerging non-volatile memory technologies from Coughlin Associates and Objective Analysis.

The report projects that the total MRAM baseline annual shipping capacity will rise from an estimated 133TB in 2022 to 4.56EB in 2033. Total MRAM revenues are expected to increase from \$118M in 2022 to about \$98.3B by 2033 compared to projected revenues for DRAM and NAND.

Much of this revenue gain will be at the expense of SRAM, NOR flash and some DRAM, although STT-RAM is developing its own special place in the pantheon of shipping memory technologies.

Read more [here](#).

Why Trust is Good, but DRAM Testing is Better

Have you ever experienced random boots or single-cell fails in your DRAMs? How fast did you find the root cause? And more importantly, what was the impact?

As vital as DRAMs are for virtually all designs, they are not immune to errors and some of those only occur after hours of use once a product is widely shipped and deployed. Find out how to avoid costly recalls and join Peter Pöschmüller, CEO of MEMPHIS and Neumonda, for his session during the Industry Tech Days held by All About Circuits.

On October 5 at 10 am ET / 4pm CET the Silicon-term expert in the DRAM industry introduces a revolutionary new approach to application-specific DRAM testing and its impact on the industry.

Read more and register [here](#).

Samsung Introduces 32Gb DDR5

Samsung has developed the industry's first and highest-capacity 32-gigabit (Gb) DDR5 DRAM using 12 nm-class process technology only a few months after taking up mass production of its 12nm-class 16Gb DDR5 DRAM.

Having developed its first 64-kilobit (Kb) DRAM in 1983, Samsung has now succeeded in enhancing its DRAM capacity by a factor of 500,000 over the last 40 years.

Previously, DDR5 128GB DRAM modules manufactured using 16Gb DRAM required the Through Silicon Via (TSV) process. However, by using Samsung's 32Gb DRAM, the 128GB module can now be produced without using the TSV process, while reducing power consumption by approximately 10% compared to 128GB modules with 16Gb DRAM.

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

Intelligent Memory Introduces LPDDR4x

Intelligent Memory (IM) extends its portfolio of low-power products with its new LPDDR4x SDRAMs, the extended version according to the JEDEC specification. They are available in densities from 4Gb to 64Gb and x16 and x32 organizations in a 200-ball FBGA package.

The LPDDR4x components are also offered with industrial temperature grades which range from -40C to +95C. They feature a maximum data rate performance of up to 4266 Mbps and an operating I/O (VDDQ) voltage as low as 0.6V.

These savings turned out to be compelling for applications even when considering the added cost to cater for a new voltage I/O power supply in the system.

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

Meet MEMPHIS at EDS 2023

Are you going to Engineering Design Show 2023 in Coventry, UK, on October 11 and 12? Then make sure you swing by our booth K53.

You won't find a memory portfolio that is as comprehensive as ours and we will provide insights into the highly volatile memory market. And if you can't find just the right DRAM Module, we will configure it for you.

Plus, we will provide insights into the highly volatile memory market. Based on our over 30 years of experience in the global distribution of memory products, we can advise on current pricing and delivery trends regarding DRAM and Flash components as well as modules.

Learn more [here](#).

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