



SATYA KUMAR, CORPORATE VICE PRESIDENT, INVESTOR RELATIONS AND TREASURY

Thank you, and welcome to Micron Technology's fiscal first-quarter 2024 financial conference call. On the call with me today are Sanjay Mehrotra, our president and CEO, and Mark Murphy, our CFO. Today's call is being webcast from our Investor Relations site at investors.micron.com, including audio and slides. In addition, the press release detailing our quarterly results has been posted on the website, along with the prepared remarks for this call.

Today's discussion of financial results is presented on a non-GAAP financial basis unless otherwise specified. A reconciliation of GAAP to non-GAAP financial measures can be found on our website. We encourage you to visit our website at micron.com throughout the quarter for the most current information on the company, including information on financial conferences that we may be attending. You can also follow us on X at [MicronTech](https://microntech.com).

As a reminder, the matters we are discussing today include forward-looking statements regarding market demand and supply, our expected results, and other matters. These forward-looking statements are subject to risks and uncertainties that may cause actual results to differ materially from statements made today. We refer you to the documents we file with the SEC, including our most recent Form 10-K and 10-Q, for a discussion of risks that may affect our future results. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance, or achievements. We are under no duty to update any of the forward-looking statements to conform these statements to actual results.

I'll now turn the call over to Sanjay.

SANJAY MEHROTRA, PRESIDENT AND CHIEF EXECUTIVE OFFICER

Thank you, Satya.

Good afternoon, everyone.

Intro and FQ1 Highlights

In fiscal Q1, Micron delivered revenue, gross margin and EPS above the high end of the guidance ranges we provided at the last earnings call, reflecting Micron's strong execution combined with improved pricing.

We are in the very early stages of a multi-year growth phase catalyzed and driven by generative AI, and this disruptive technology will eventually transform every aspect of business and society. Memory is at the heart of GPU-enabled AI servers, and we are already seeing strong demand driven by early deployment of



AI solutions, which will only accelerate over time. Micron is well positioned to leverage this growth, having executed the most robust set of new technology and product introductions in our 45-year history.

The improved supply-demand environment in the current calendar quarter gives us additional confidence in the trajectory of our business. We have driven a strong inflection in industry pricing this calendar quarter, which will allow us to benefit from higher prices earlier in our fiscal year compared to prior plans. We intend to stay very disciplined with our supply and capacity investments as our pricing is still far from levels associated with necessary return on investment (ROI). We expect our pricing to continue to strengthen through the course of calendar 2024. We expect improved margins and financial performance throughout 2024, and record industry total addressable market (TAM) in calendar 2025.

Technology Update

We have made significant progress with our industry-leading technology roadmap.

Micron is at the forefront of ramping the industry's most advanced technology nodes in both DRAM and NAND. The vast majority of our bits are on leading-edge nodes: 1 α (1-alpha) and 1 β (1-beta) in DRAM and 176-layer and 232-layer in NAND. As previously stated, both 1 β DRAM and 232-layer NAND nodes have reached mature yields faster than the prior nodes. We expect fiscal 2024 front-end cost reductions to track in line with our long-term expectations of mid-to-high single digits in DRAM and low teens in NAND. We are on track for volume production in 1 γ (1-gamma) DRAM using extreme ultraviolet lithography (EUV) in calendar 2025.

End Markets

Now turning to our end markets.

Inventories for memory and storage are at or near normal levels for most customers across PC, mobile, automotive and industrial end markets. Consequently, the demand that we see from customers in these markets is closer to their end-market demand. Data center customer inventory of memory and storage is improving, and we continue to expect customer inventory to approach normal levels in this market sometime in the first half of calendar 2024. Across our data center and PC markets, we are ahead of the industry in our transition to DDR5 (D5) and we expect to cross over our D5 volume from DDR4 (D4) in early calendar 2024.

Generative artificial intelligence (AI) use cases are expanding from the data center to the edge, with several recent announcements of AI-enabled PCs, smartphones with on-device AI capabilities, as well as embedded AI in the auto and industrial end markets.

The proliferation of on-device AI at the edge offers a host of benefits such as enhanced privacy, lower latency, improved performance, greater personalization and competitive costs for a wide range of use cases, from content creation to productivity.



We see a rapid evolution in our customer product roadmaps enabling and leveraging this AI market expansion, which in turn is driving higher capacity, lower power and increased performance requirements for memory and storage. We expect to increasingly benefit from content growth as these trends in AI gain momentum.

Data Center

In data center, total server unit shipments are expected to increase by a mid-single-digit percentage in calendar 2024, following a year of low double-digit percentage decline in calendar 2023. Demand for AI servers has been strong as data center infrastructure operators shift budgets from traditional servers to more content-rich AI servers. Also, in response to AI-driven data center demand, several customers have announced aggressive roadmaps for new graphics processing unit (GPU) and AI accelerator ASIC product introductions with increasing requirements for high bandwidth memory (HBM) capacity, performance, and power.

Micron is addressing these exciting opportunities brought on by the proliferation of AI with an industry-leading portfolio of data center solutions, including HBM3E, D5, several types of high-capacity server memory modules, low power DRAM (LPDRAM), and data center SSDs.

We have received very positive customer feedback on our HBM3E, which has approximately 10% better performance and about 30% lower power consumption compared to competitive offerings of HBM3E. In fiscal Q1, we shipped samples of HBM3E to a number of key partners and are making good progress in our qualifications. Micron is in the final stages of qualifying our industry-leading HBM3E to be used in NVIDIA's next generation Grace Hopper GH200 and H200 platforms. In addition, our LP5X is being used for the Grace CPU, driving a new use case for LP memory in the data center for accelerated computing.

We are on track to begin our HBM3E volume production ramp in early calendar 2024 and to generate several hundred millions of dollars of HBM revenue in fiscal 2024. We expect continued HBM revenue growth in 2025, and we continue to expect that our HBM market share will match our overall DRAM bit share sometime in calendar 2025.

Last month we introduced the industry's fastest and lowest latency 128GB high-capacity modules built on our industry-leading 1 β node and using a monolithic die, which does not require 3D stacking and thus enables a simpler process flow for assembly. Featuring best-in-class performance, our solution will support customers' memory-intensive data center workloads today and into the future. Additionally, leading CPU vendors have confirmed validation support for our monolithic-die-based 128GB modules on existing platforms released in 2022 and 2023 as well as upcoming new platforms. This ensures that our offering has a significant TAM that we can address immediately. We expect volume production to start next quarter, with significant growth in fiscal 2025 and beyond.



A testament to our solid execution and superior offerings, Micron ended the third calendar quarter with record-high revenue share in data center SSDs, based on independent industry assessments. This marks the second consecutive quarter of record revenue share in data center SSDs, and we look to build on this revenue momentum through fiscal 2024.

PC

In PCs, we forecast unit volumes to grow by a low to mid-single-digit percentage in calendar 2024, after two years of double-digit percentage PC unit volume declines.

We expect PC OEMs to start ramping AI-on-device PCs in the second half of calendar 2024, with an additional capacity of 4 to 8GB of DRAM per unit, and we see average SSD capacities increasing as well. We also completed qualifications for our industry-leading 1 β -based 16Gb D5 at several PC customers in fiscal Q1.

In fiscal Q1, we achieved record bit shipments in both client and consumer SSDs, as customers adopted our industry-leading solutions. Building upon our QLC leadership, our client SSD QLC bit shipments also reached a new record in fiscal Q1. QLC now comprises the majority of our bit shipment mix for both client and consumer SSD.

This month, we also announced we are shipping the Micron 3500 NVMe SSD, the world's first performance client SSD with 200+ layer NAND. Built on our industry-leading 232-layer NAND, the 3500 will help our customers handle demanding workloads for business applications, scientific computing, gaming and content creation.

Mobile

In mobile, smartphone demand is showing signs of recovery, and we forecast smartphone unit shipments to grow modestly in calendar 2024.

Leading chipset vendors have announced powerful new products supporting on-device large language models with ten billion or more parameters. We expect smartphone OEMs to start ramping AI-enabled smartphones in 2024, with an additional capacity of 4 to 8GB of DRAM per unit.

Longer term, many popular generative AI applications will be on smartphones, and our leading product portfolio is poised to capture this memory and storage opportunity. Our new industry-leading 9.6Gbps LP5X will address the bandwidth requirements of the most demanding AI-based mobile applications. We also began sampling our next-generation 232-layer NAND UFS 3.1 and our 1 β DRAM 24Gb LP5X to support the memory needs of emerging AI foundational models.

Auto and Industrial



Last, I'll cover auto and industrial, which are end markets we value as part of the portfolio due to their relatively more predictable revenue and profitability and long-term growth opportunity.

The proliferation of AI at the edge continues to increase in the industrial and auto markets. For memory, this translates to content growth in a host of AI-enabled edge devices. For example, AI-enabled industrial PCs have 3-5 times more memory than standard PCs and there is an 8 times increase in memory content for AI-enabled edge video security cameras compared to standard non-AI video cameras.

Our automotive business achieved a new quarterly revenue record in fiscal Q1, driven by better demand and volume ramps of new vehicle platforms. As the leader in automotive market share and quality, Micron will benefit from memory and storage content growth as automotive OEMs expand features in ADAS and in-cabin applications. Our automotive design win trajectory remains strong.

Our industrial business saw double-digit sequential growth in fiscal Q1 as the industrial market continued to recover. Inventory levels for memory and storage continued to improve at distribution partners and are at normal levels at the majority of our customers. Industry fundamentals remain strong for memory and storage as the widespread adoption of IoT, AI and machine learning solutions creates new growth opportunities for us.

Market Outlook

Now, turning to our market outlook, starting with demand:

We expect calendar 2023 DRAM bit demand to grow in the high-single-digit percentage range, up from prior expectations for mid-single-digit growth. In NAND, we continue to expect calendar 2023 bit demand growth in the high-teens percentage range. Looking forward, over the next few years, we expect bit demand growth CAGRs of mid-teens in DRAM and low-20s percentage range in NAND.

We forecast calendar 2024 bit demand growth for the industry to be near the long-term CAGR for DRAM and somewhat below the long-term CAGR for NAND.

Turning to supply:

Significant supply reductions across the industry have enabled the recovery that is now underway. An extended period of supply growth less than demand growth would strengthen the pace of recovery. Micron will continue to exercise supply and capex discipline, aligned with our strategy to maintain our long-term bit market share for DRAM and NAND.

Micron's fiscal 2024 capex is projected to be between \$7.5 billion and \$8.0 billion, slightly higher than last year's levels and prior plans, primarily to support the HBM3E production ramp. We continue to expect wafer fab equipment (WFE) capex in fiscal 2024 to be down year over year.



As we have discussed previously, the ramp of HBM production will constrain supply growth in non-HBM products and will help improve the overall DRAM industry supply-demand balance. Across the industry, the HBM3E die is roughly twice the size of equivalent-capacity D5. Additionally, the HBM product includes a logic interface die and has a substantially more complex packaging stack that impacts yields. These factors result in HBM consuming more than two times the wafer supply as D5 to produce a given number of bits.

In last quarter's earnings call, we communicated that we strategically diverted underutilized equipment toward ramping new technology nodes, which will help us increase leading-edge production in a capital efficient manner. Since the number of wafer processing steps is higher for leading-edge nodes, this approach of diverting underutilized tools to the leading edge meaningfully reduces our overall wafer capacity. Thus, underutilization in our fabs early this fiscal year transitions to structurally lower wafer capacity at higher utilization rates as we move through the fiscal year. Reports indicate that this redeployment of underutilized tools at the leading edge is an industry-wide practice that is likely to constrain industry supply in 2024.

Taking all these factors into account, Micron's bit supply growth in fiscal 2024 is planned to be well below demand growth for both DRAM and NAND, and we expect to decrease our days of inventory in fiscal year 2024.

We expect calendar 2024 industry supply to be below demand for both DRAM and NAND, which will result in a contraction of industry inventory levels.

As we have highlighted before, we continue to work with the U.S. government and CHIPS grants are assumed in our capex plans for fiscal 2024. The viability and global competitiveness of our Idaho and New York projects depends on Micron receiving CHIPS grants to address the cost difference compared to overseas expansion.

To better support our customers around the globe, we have opened state-of-the-art assembly and test facilities in Malaysia and Taiwan. We are proceeding with our previously announced expansion of our Xi'an facility, having received approval from Chinese authorities for our planned investment. In fiscal Q1, we achieved the first mobile customer qualification of LPDRAM assembled at our Xi'an site — furthering our strong commitment to serve our mobile customers in China.

Our broad, diverse network of global operations remains a key element of our strategy to address customer demand in a reliable and resilient fashion. Our leading technology, strengthening product portfolio, strong manufacturing capabilities, and our dedicated team members position us well to capture the opportunities ahead. I will now turn it over to Mark for our financial results and outlook.



MARK MURPHY, EXECUTIVE VICE PRESIDENT AND CHIEF FINANCIAL OFFICER

Thanks, Sanjay, and good afternoon, everyone.

Opening

Micron delivered strong results in fiscal Q1 with revenue, gross margin, and EPS higher than the upper end of the guidance range we provided in our last earnings call. During the quarter, an improving supply-demand environment and our team's strong execution resulted in higher prices across DRAM and NAND. The current pricing trajectory has improved our financial outlook for the second quarter and full fiscal year.

Revenue

Total fiscal Q1 revenue was approximately \$4.7 billion, up 18% sequentially and up 16% year over year.

DRAM

Fiscal Q1 DRAM revenue was \$3.4 billion, representing 73% of total revenue. DRAM revenue increased 24% sequentially, with bit shipments increasing in the low-20s percentage range and prices increasing in the low-single-digit percentage range. Robust bookings entering the quarter, including customer strategic buys that occurred in prior quarters for FQ1 shipment, limited our reported FQ1 DRAM price increases despite Micron's strong execution on CQ4 pricing. Our strong calendar Q4 price execution contributes to our solid sequential growth in FQ2, even with the effect of seasonality.

NAND

Fiscal Q1 NAND revenue was \$1.2 billion, representing 26% of Micron's total revenue. NAND revenue increased 2% sequentially with pricing more than offsetting an expected and communicated decline in volumes. Bit shipments declined in the mid-teens percentage range after record shipments in the prior quarter, and prices increased by approximately 20%. Portfolio mix improvements in NAND contributed to the increase.

Revenue by Business Unit

Now turning to revenue by business unit.

Compute and Networking Business Unit revenue was \$1.7 billion, up 45% sequentially. Data center and client shipments strengthened in the quarter. AI-related shipments increased in the data center market and normalized inventory at client customers enabled bit shipment growth.



Revenue for the Mobile Business Unit was \$1.3 billion, up 7% sequentially. Mobile revenue continued to show strength as customer inventories normalized and smartphone units and average memory and storage capacity growth at customers drove demand. Our mobile fiscal Q1 revenue almost doubled from year-ago levels.

Embedded Business Unit revenue was \$1 billion, up 21% sequentially. Growth was strong across most end markets.

Revenue for the Storage Business Unit was \$653 million, down 12% sequentially due to sharply lower consumer component sales, partially offset by strong growth in SSD revenue.

Operating Results

Gross Margin

The consolidated gross margin for fiscal Q1 was near 1%, improving 10 percentage points sequentially and driven by higher prices and a greater mix of DRAM products.

Opex

Operating expenses in fiscal Q1 were \$992 million, up \$150 million sequentially and in line with our late November update. Opex increased on higher R&D expenditures and the reinstatement of certain compensation programs suspended in the prior fiscal year including short-term incentive compensation.

Operating Income

We had an operating loss of \$955 million in fiscal Q1, resulting in an operating margin of negative 20%, improved from negative 30% in the prior quarter.

Taxes

Fiscal Q1 taxes were \$59 million, lower than the anticipated \$80 million based on an updated view of projected taxes across the year, driven by our improved fiscal 2024 outlook.

Earnings Per Share

The non-GAAP loss per share in fiscal Q1 was \$0.95 compared to a non-GAAP loss per share of \$1.07 in the prior quarter and a non-GAAP loss per share of \$0.04 in the year-ago quarter.

Cash Flow



Turning to cash flows and capital spending, our operating cash flows were approximately \$1.4 billion in fiscal Q1 representing 30% of revenue. During the quarter, we received \$600 million in customer prepayments to secure supply for leading-edge memory products.

Capital expenditures were \$1.7 billion during the quarter resulting in free cash flow of negative \$333 million in the quarter.

Inventory

Our fiscal Q1 ending inventory was \$8.3 billion or 159 days, down from 170 days in the prior quarter. As mentioned in prior quarters, we hold strategic inventory stock associated with build ahead of products for cost optimization and risk mitigation. Excluding strategic stock, our fiscal Q1 ending inventory days would be approximately 142 days, only 22 days higher than our target inventory level.

Total Cash/Debt

On the balance sheet, we held \$9.8 billion of cash and investments at quarter end and maintained \$12.3 billion of liquidity when including our untapped credit facility. We ended the quarter with \$13.5 billion in total debt, low net leverage and a weighted average maturity on our debt of 2030.

Outlook

Now turning to our outlook for the fiscal second quarter.

While we remain mindful of macroeconomic risks, the memory and storage market environment is improving. We expect supply-demand balance to tighten in both DRAM and NAND throughout 2024. Our leading-edge DRAM and NAND nodes are oversubscribed for the full year. Consequently, we expect prices to increase through calendar 2024, driving improvements in our financial performance.

Our leading-edge inventory is very tight, and we are also working to minimize pull-in of customer demand in response to higher pricing. As a result, our sequential growth in the near term will be driven primarily by pricing rather than a sequential increase in bit shipments. Both DRAM and NAND bit shipments are expected to decline somewhat in the fiscal second quarter.

We expect our fiscal Q2 gross margin to benefit from sequential price increases and reduced impact from underutilization. We project the balance of previously written-down inventories to clear in fiscal Q2.

We forecast operating expenses to decline in the fiscal second quarter on lower R&D program expenses and an asset sale previously expected to occur in the first quarter. For the fiscal year, due to some higher R&D expenses including what we saw in Q1 and higher short-term incentive compensation from an improved outlook, we now project opex to be over \$3.9 billion.



We forecast a much reduced operating loss in fiscal Q2 and project a return to operating income in Q3.

Our tax forecast for the year has increased from under \$200 million to over \$300 million based on an updated taxable income outlook. We project the allocation of tax expense across the year to be heaviest in the fourth quarter driven by profitability and other factors. As we've mentioned previously, at current levels of profitability, tax estimates and the distribution of taxes across the year are highly sensitive to changes in the outlook.

We plan fiscal Q2 capital expenditures to be in line with first quarter levels. We see operating cash flows improving substantially in the second half of the fiscal year and are now forecasting positive free cash flow in the fiscal fourth quarter.

Non-GAAP Guidance

With all these factors in mind, our non-GAAP guidance for fiscal Q2 is as follows.

We expect revenue to be \$5.3 billion, plus or minus \$200 million; gross margin to be in the range of 13%, plus or minus 150 basis points; and operating expenses to be approximately \$950 million, plus or minus \$15 million. We expect tax expenses of approximately \$45 million.

Based on a share count of approximately 1.1 billion shares, we expect a loss of \$0.28 per share, plus or minus \$0.07.

Closing

In closing, the industry environment is improving, and our financial outlook has strengthened for the fiscal year and beyond. We will continue to take a disciplined approach to managing the business and remain focused on optimizing price, driving productivity, and controlling capital spend. With high levels of liquidity and low net leverage, we continue to operate from a position of balance sheet strength as we forecast a return to profitability and positive free cash flow.

I will now turn it back over to Sanjay.

SANJAY MEHROTRA, PRESIDENT AND CHIEF EXECUTIVE OFFICER

Thank you, Mark.

Over the last year, our world-class technology, business and manufacturing teams ensured ongoing leadership in foundational memory technologies and the expansion of our industry-leading product portfolio. We are encouraged by the progress we have made on pricing, and we are on track to restore profitability more commensurate with the great value our solutions provide to our customers.



We expect 2024 to be a year of recovery and can see the path towards a healthy supply-demand environment along with strong growth in critical new technologies like HBM3E. From the data center to the edge, AI has emerged as a significant secular driver that will further bolster the industry towards record revenue TAM in 2025 and drive growth for years to come. Micron's broad and growing suite of leading-edge products positions us well to capitalize on the immense opportunities ahead.

Thank you for joining us today. We will now open for questions.