



Sanjay Mehrotra, President and Chief Executive Officer

Micron executed well in the second quarter, delivering solid results and healthy levels of profitability and free cash flow, despite a challenging industry environment. We continued to strengthen our balance sheet in the quarter by increasing our cash position and total liquidity. Although we expect industry headwinds in the near-term, we continue to grow and diversify our product portfolio, improve our cost competitiveness and lay the foundation to emerge stronger — both financially and operationally — from this environment.

I would like to start with a review of two important pillars of Micron's strategy: improving cost competitiveness and increasing high-value solutions in our portfolio. Our strategy positions us for the tremendous opportunities ahead, while also enabling us to better navigate near-term headwinds. Strong execution against this strategy has improved our annualized profitability by over \$6 billion from fiscal 2016 to fiscal 2018. This has improved our EBITDA margin by more than 15 percentage points relative to our competitors over the same period.¹

We expect further progress on cost reduction this fiscal year, including healthy year-over-year cost declines in both DRAM and NAND. In DRAM, our 1Y nanometer is yielding well, and we expect to increase conversion to 1Y nanometer in the second half of fiscal 2019. We are also making excellent progress on 1Z nanometer and have started sampling products utilizing this technology. As we have said in the past, future DRAM node transitions require additional process steps and more fab cleanroom space. Consequently, in addition to the previously announced expansion of our Hiroshima facility, we are starting site preparation for the cleanroom expansion at our Taichung facility to enable the transition of existing DRAM wafer capacity to future nodes. We are still finalizing the timing but expect production output sometime in calendar 2021.

In NAND, we achieved meaningful production on 96-layer 3D NAND in fiscal Q2 with the fastest yield ramp of any NAND product in our history. We are also making good progress on development of our fourth-generation 3D NAND, which uses our replacement gate technology. Given the high initial capital requirements of floating gate to replacement gate conversion, we expect that our first replacement gate node will provide limited cost reduction, and hence we are planning to deploy this node across select NAND products, with the rest of the portfolio converting later to the second node of replacement gate. This approach will optimize the ROI of our NAND capital investments as we convert our capacity. As a reminder, our replacement gate architecture will allow us to deliver performance improvements and provide us an efficient path toward scaling multiple future generations of 3D NAND. Given the limited initial deployment at the first node of replacement gate, we expect that our NAND bit supply growth in calendar 2020 will be below industry demand levels, and we plan to utilize our cost-effective floating gate inventory position to meet customer requirements.

¹ Based on internal estimates derived from publicly available information.



Turning to high-value solutions, more than two-thirds of NAND revenues in the first half of fiscal 2019 were from high-value solutions, up from 55 percent in the first half of 2018. This increased mix of high-value solutions, combined with our competitive cost structure, enabled us to deliver fiscal Q2 NAND gross margin in the high 30s despite steep price declines in the industry.

In SSDs, we are making progress on transitioning to NVMe while continuing to improve our cost profile in SATA. In fiscal Q2, we began revenue shipments to a large PC OEM for our first NVMe client SSD, which features our internally designed controller, and are in active qualifications with other customers. We intend to introduce cloud and enterprise NVMe SSDs later this calendar year. In SATA, we introduced consumer and client SSDs based on 96-layer 3D NAND in fiscal Q2. In the cloud market, our custom persistent memory solution, which combines DRAM and NAND, is now fully ramped and contributed meaningfully to our cloud revenues.

3D XPoint™ development remains on track with customer samples planned before calendar year-end. We believe 3D XPoint technology will be a key enabler for numerous new applications, particularly artificial intelligence and data analytics. As announced previously, in January of this year we exercised our option to acquire Intel's interest in the IMFT facility in Lehi, Utah. This acquisition provides us with the manufacturing capability and highly skilled talent to drive 3D XPoint development and innovation.

Now turning to end markets:

I'll start with Mobile. During fiscal Q2 we grew revenues and expanded gross margins year-over-year despite adverse memory and storage pricing and weakness in high-end smartphone unit sales. Our performance in mobile was propelled by growth in our managed NAND portfolio, where NAND bit shipments grew more than 5X year-over-year. We are also seeing strong demand for our 1Y-nanometer LPDRAM due to its industry-leading capacity and best-in-class power consumption.

Memory and storage content growth in smartphones continues, driven by features such as multiple cameras, machine learning, computational photography and 4K video. Last month, Samsung announced its premium Galaxy S10 Plus smartphone, featuring 12 gigabytes of DRAM and 1 terabyte of NAND. At Mobile World Congress, several companies announced exciting new phones featuring 5G connectivity and foldable screens. These next-generation premium smartphones will typically feature 8 to 12 gigabytes of DRAM and 256 to 512 gigabytes of NAND versus 4 to 6 gigabytes of DRAM and 64 to 128 gigabytes of NAND in current-generation premium smartphones. These trends will likely cascade to lower-tier phones as well. We believe that 5G, foldable phones and upcoming innovations in augmented and virtual reality will drive sustained content growth for years to come and should reignite smartphone unit sales beginning in calendar 2020.

We are also excited by the opportunity that 5G is likely to create beyond mobile, as it will enable true machine-to-machine communication and accelerate data creation and analysis, which are fundamental drivers for our business. We expect 5G adoption to create increased demand for memory and storage in



IoT devices, wireless infrastructure and data centers. Our embedded and networking businesses are already starting to see benefit from early 5G infrastructure investments.

In the data center market, the demand for memory has moderated this year following exceptional growth in the last two years. The slowdown in demand is a result of ongoing customer inventory adjustments, as well as software optimizations at some cloud customers. We expect growth to resume in the second half of calendar 2019 as we see improvement in our customers' inventory position. New server processors that support higher memory densities are expected to be introduced in a few months, which should drive additional demand growth in the second half of calendar 2019. In fiscal Q2, we shipped high-density 1Y-nanometer DDR4 server module samples to customers ahead of plan, which will position us well to benefit from this new CPU platform ramp.

In graphics, we grew sales of our high-performance GDDR6 DRAM and expanded our customer base, which positions us for stronger growth in the second half of calendar 2019. We are seeing steep customer inventory adjustments in GDDR5 and expect them to be largely completed by the middle of this calendar year.

We had another strong quarter in automotive with year-over-year revenue growth driven by increasing demand for ADAS and advanced in-vehicle infotainment systems. In fiscal Q2, we announced several new automotive products, including a collaboration with Qualcomm for next-gen in-vehicle infotainment and 5G communications modules. We also announced a new strategic collaboration with a leading supplier of ADAS platforms using our full portfolio of memory and storage products. Lackluster automobile unit sales are a short-term challenge, however, we see the auto market generating robust growth for Micron over the next decade, as memory and storage content continues to increase in autos, driven by advanced infotainment systems and the adoption of autonomous vehicles.

In the industrial and consumer markets, we saw a decline in sales due to seasonal, macroeconomic and pricing weaknesses, as well as inventory adjustments. We had important design wins in video surveillance, point of sales and factory automation applications. At Mobile World Congress, we announced the industry's first 1TB microSD card using QLC NAND.

In the PC market, sales declined more than 25 percent sequentially driven by weaker pricing and the inventory drawdown seen in other segments, as well as client CPU shortages. We remain focused on our cost competitiveness in this market, and over two-thirds of our PC DRAM bit shipments are now coming from our advanced 1X- and 1Y-nanometer technology nodes.

Now turning to our DRAM industry outlook:

Since our last earnings call, DRAM pricing weakened more than expected. Our demand outlook for calendar 2019 has moderated, led by somewhat greater levels of customer inventory, weakening server demand at several enterprise OEM customers and worse-than-expected CPU shortages. We believe macroeconomic uncertainty is also contributing to hesitation in buying behavior at some customers.



However, as we discussed on our last earnings call, we still expect DRAM bit shipments to begin increasing in our fiscal Q3, with demand growth strengthening in the second half of calendar 2019 as most customer inventories are likely to normalize by mid-year.

Based on our current view, we now estimate calendar 2019 DRAM bit demand growth from our customers to be in the low-to-mid teens, with their end demand a few points above that. Further, we estimate industry supply bit growth is tracking to mid-to-high teens.

Given the lower DRAM demand outlook from our customers, we have decided to idle approximately 5 percent of our DRAM wafer starts. This action will bring our production levels close to our view of DRAM industry bit demand growth for calendar 2019. We will continue to monitor the market and take appropriate actions to ensure that our bit supply growth in calendar 2019 remains closely aligned with demand.

Looking beyond our fiscal 2019, we expect bit demand growth to accelerate as mobile and server demand improves. In particular, we expect robust DRAM bit demand growth in fiscal 2020, bouncing back from a weak fiscal 2019.

NAND markets remain oversupplied from the acceleration in bit growth driven by the industry transition to 64-layer 3D NAND. Although fiscal Q2 pricing came in below our expectations, we are optimistic that demand elasticity and seasonal trends will support improving demand growth in the second half of the calendar year. We expect that calendar 2019 NAND bit demand growth is likely to be in the mid-30s percent range, with industry supply growing in the high-30s, and we are targeting our bit shipments to grow close to the growth rate of industry bit demand. We have been managing our NAND bit supply growth prudently, including adjusting our capital planning and wafer volumes. We are reducing our total NAND wafer starts by approximately 5 percent, mostly through reductions on our legacy nodes.

Given these changes in DRAM and NAND industry conditions, we have reduced our capex for fiscal 2019 and are evaluating our capex for fiscal 2020. We are taking prudent actions to address the current market conditions, while executing well on our long-term strategic objectives.

Dave Zinsner, Senior Vice President and Chief Financial Officer

Micron's fiscal Q2 results were within our guidance as we executed well in a period of somewhat weaker-than-expected market conditions. In the quarter, we returned capital to shareholders, continued to improve our cost structure and strengthened our balance sheet through our first issuance of investment-grade debt. Most of the proceeds from this offering were used to redeem a large portion of our outstanding convertible notes, reducing our fully diluted share count.

Total fiscal Q2 revenue was \$5.8 billion, down 21 percent from the prior year and down 26 percent from the fiscal first quarter. Revenue reflected worse-than-expected pricing trends in DRAM and NAND.



DRAM revenue was down 28 percent year-over-year and 30 percent sequentially from the fiscal first quarter and represented 64 percent of total company revenue in the fiscal Q2. DRAM ASPs declined in the low 20 percent range compared to the prior quarter, while shipment quantities were down in the low double-digits. Year-over-year, DRAM bit shipments were down mid-single digits.

NAND revenue declined 2 percent year-over-year and 18 percent from the prior quarter. NAND revenue represented 30 percent of total company revenue in the fiscal Q2. Our overall NAND ASP declined in the mid-20 percent range, while shipment quantities increased in the upper single-digit percent range compared to the prior quarter. NAND bit shipments came in stronger than our expectation due to timing of demand from a large customer.

Now turning to our revenue trends by Business Unit.

Revenue for the Compute and Networking Business Unit was \$2.4 billion, down 35 percent year-over-year and 34 percent from the prior quarter. The sequential decline was driven by pricing across major market segments, as well as volume reductions, particularly in graphics, cloud and PCs.

Revenue for the Mobile Business Unit or MBU was \$1.6 billion, up 3 percent year-over-year and down 27 percent from the record fiscal first quarter. Lower volume due to weak seasonality and pricing contributed to the quarter-over-quarter revenue decline. Despite the current market conditions, MBU revenue grew year-over-year due to strong growth in our managed NAND products.

The Embedded Business Unit revenue of \$800 million was down 4 percent compared to the prior year and down 14 percent from the record fiscal first quarter. The automotive business was only down slightly from record fiscal first quarter, despite weakness in automobile sales. Other embedded revenue declined quarter-over-quarter due to weaker pricing and lower DRAM volumes.

Finally, the Storage Business Unit fiscal Q2 revenue was \$1.0 billion, down 19 percent year-over-year and down 11 percent quarter-over-quarter. The sequential decline was driven by lower SSD revenue, partially offset by increased component revenue.

The consolidated gross margin for the fiscal Q2 was 50 percent compared to 58 percent in the prior year and 59 percent in the fiscal first quarter. Fiscal Q2 results included ongoing impact from 3D XPoint underutilization costs, which approximated 160 basis points. Pricing came in weaker than expected in both DRAM and NAND, but strong execution on cost reductions resulted in gross margins within our guidance range.

Fiscal Q2 operating expenses of \$818 million came in at the high end of our guided range. OpEx included \$37 million in one-time tool impairment costs that were not anticipated in our guidance. Excluding this impairment, OpEx would have come in at the low end of our guidance. We remain focused on controlling our expenses, while investing in future products and technologies.



We delivered solid profitability in the fiscal Q2 with operating income of \$2.1 billion, representing 36 percent of revenue. This margin is down 13 percentage points year-over-year and also down 13 percentage points from the fiscal first quarter.

The tax rate for the fiscal Q2 was approximately 8.3 percent. We now expect our fiscal 2019 tax rate to be approximately 10.5 percent.

Non-GAAP earnings per share in the fiscal Q2 were \$1.71, down from \$2.82 in the year-ago quarter and down from \$2.97 in the prior quarter.

Turning to cash flows and capital spending, in the fiscal Q2 we generated \$3.4 billion in cash from operations, representing 59 percent of revenue.

Capital spending, net of third-party contributions, was approximately \$2.4 billion, relatively flat compared with the prior quarter. We have lowered our CapEx target for fiscal 2019 to approximately \$9 billion from our prior guidance range of \$9 to \$9.5 billion, as we manage through the current environment while maintaining investment in our strategic priorities. As we mentioned before, a significant portion of our CapEx this year is going towards cleanroom construction and assembly and test operations, which do not contribute to our bit supply growth. Fab equipment spend in fiscal 2019 is down from last year and is mostly targeted towards migrating 20-nanometer DRAM and 32-layer 3D NAND to more advanced nodes, with no new wafer capacity additions. The investment in these technology transitions provides compelling cost reduction and a very attractive ROI. As we have demonstrated over the past two quarters, we remain nimble on CapEx based on business conditions.

In the fiscal Q2, our adjusted free cash flow, defined as Cash Flow from Operations less Net CAPEX was approximately \$1 billion, compared to \$2.2 billion in the year-ago quarter and \$2.3 billion in the fiscal first quarter. We deployed approximately 70 percent of the quarter's free cash flow towards our share repurchase program. We bought back approximately \$700 million of stock in fiscal Q2, representing 21 million shares.

Through the first half of fiscal 2019, we repurchased 63 million shares for \$2.5 billion, utilizing 76 percent of our free cash flow in fiscal first half. We continue to view share repurchases as an attractive use of capital and remain committed to deploying at least 50 percent of our free cash flow on an annual basis towards repurchases under our current \$10 billion authorization. In addition to the buybacks, we also eliminated our 2043 converts subsequent to the quarter close, which at current share prices effectively lowered our fully diluted share count by approximately 9 million shares. Note that the underlying share count for these converts was 35 million shares, which could have resulted in greater dilution with increases in our share price.

Inventory ended the quarter at \$4.4 billion, increasing from \$3.9 billion at the end of the fiscal first quarter. Our fiscal Q2 days of inventory were 134 days compared to 107 days in the fiscal first quarter. The actions we have announced today regarding supply reduction, combined with improving customer demand, will begin to address our higher inventory levels.



We ended the fiscal Q2 in a strong liquidity position with net cash of \$3.0 billion and total liquidity of nearly \$12 billion. Total cash increased to \$9.2 billion largely as a result of our \$1.8 billion debt issuance. Our debt position increased by \$2.1 billion to \$6.2 billion in the quarter primarily due to the debt offering and recognition of premium associated with the Series G convertible note redemption. Subsequent to quarter end, we used \$1.4 billion of cash to complete the convertible note redemption, which reduced our outstanding GAAP debt balance by approximately \$1.1 billion.

On January 14th, we exercised our call option to acquire IMFT, our joint venture with Intel. We expect to close the transaction in either late fiscal 2019 or in the first half of fiscal 2020. This near \$1.5 billion transaction will also retire the \$1 billion of joint-venture-related debt on Micron's balance sheet. Since we already consolidate IMFT's results in our financial statements, we do not expect a material impact to our near-term results.

Now turning to our market outlook. DRAM and NAND markets are working through supply and demand imbalances. Our visibility remains low and the near-term environment remains challenging. While there have been CapEx reductions across the industry they haven't yet impacted output growth due to lead times. We expect our DRAM bit shipments to grow sequentially during the fiscal third quarter and at much higher rates in the fiscal fourth quarter. In NAND, we expect a modest sequential decline in our bit shipments in the fiscal third quarter due to timing of shipments and expect growth to resume in the fiscal fourth quarter. The output reductions that we announced today for DRAM and NAND, and the \$1.5 billion of CapEx reductions that we have announced year to date, should also help reduce our supply of DRAM and NAND in the second half of this calendar year.

With that in mind, our non-GAAP guidance for the fiscal third quarter is as follows. We expect revenue to be in the range of \$4.80 billion plus or minus \$200 million, gross margin to be in the range of 37 to 40 percent and operating expenses at approximately \$785 million, plus or minus \$25 million. Based on a share count of approximately 1.14 billion fully diluted shares, we expect EPS to be \$0.85 cents, plus or minus 10 cents.

In closing, Micron continues to execute on our key initiatives: increasing our mix of high-value solutions, improving our cost profile and investing in new and innovative products. Our solid financial footing, strong liquidity and substantially reduced leverage means that we are well positioned to invest in our future despite near-term market conditions.

Sanjay Mehrotra, President and Chief Executive Officer

In response to near-term industry conditions, we are taking decisive action to reduce our supply growth to be consistent with industry demand. At the same time, we continue to invest and execute against our strategic priorities to reduce costs and increase the mix of high-value solutions in our portfolio. The long-term demand trends for Micron remain very healthy, with tremendous growth opportunities across multiple markets. We continue to believe that the memory industry is structurally stronger with more



diversified demand drivers and moderating supply growth capability. With our strong balance sheet and improved product portfolio and operating model, Micron is better positioned than ever before to win and deliver long-term value for shareholders.