

MICRON TECHNOLOGY INC  
Form 10-K  
October 25, 2011

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549  
FORM 10-K  
(Mark One)

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES  
EXCHANGE ACT OF 1934

For the fiscal year ended September 1, 2011

OR  
☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES  
EXCHANGE ACT OF 1934

For the transition period from \_\_\_\_\_ to \_\_\_\_\_  
Commission file number 1-10658

Micron Technology, Inc.  
(Exact name of registrant as specified in its charter)

Delaware 75-1618004

(State or other jurisdiction of incorporation or  
organization) (IRS Employer Identification No.)

8000 S. Federal Way, Boise, Idaho 83716-9632

(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code (208) 368-4000

Securities registered pursuant to Section 12(b) of the Act:

| Title of each class | Name of each exchange on which registered |
|---------------------|---|
|---------------------|---|

|   |                             |
|---|-----------------------------|
| Common Stock, par value \$.10 per share | NASDAQ Global Select Market |
|---|-----------------------------|

Securities registered pursuant to Section 12(g) of the Act:

None

(Title of Class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒ T

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ☐ No ☒ T

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☐ No ☒ T

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ T No ☐ T

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐ T

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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act:

|   |  |   |  |
|---|--|---|--|
| Large Accelerated Filer <input checked="" type="checkbox"/> | Accelerated Filer <input type="checkbox"/> | Non-Accelerated Filer <input type="checkbox"/><br>(Do not check if a smaller reporting company) | Smaller Reporting Company <input type="checkbox"/> |
|---|--|---|--|

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the voting stock held by non-affiliates of the registrant, based upon the closing price of such stock on March 3, 2011, as reported by the NASDAQ Global Select Market, was approximately \$9.1 billion. Shares of common stock held by each executive officer and director and by each person who owns 5% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of outstanding shares of the registrant's common stock as of October 18, 2011, was 987,573,286.

DOCUMENTS INCORPORATED BY REFERENCE: Portions of the Proxy Statement for the registrant's 2011 Annual Meeting of Shareholders to be held on January 24, 2012, are incorporated by reference into Part III of this Annual Report on Form 10-K.

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## PART I

### ITEM 1. BUSINESS

The following discussion contains trend information and other forward-looking statements that involve a number of risks and uncertainties. Forward-looking statements include, but are not limited to, statements such as those made in "Products" regarding growth in demand for NAND Flash products and solid-state drives and the growth in the markets for phase change memory products; in "Manufacturing" regarding the transition to smaller line-width process technologies and increases in output from IM Flash's wafer fabrication facility in Singapore; and in "Research and Develop" regarding tool installation at our new research and development facility in Boise, Idaho. Our actual results could differ materially from our historical results and those discussed in the forward-looking statements. Factors that could cause actual results to differ materially include, but are not limited to, those identified in "Item 1A. Risk Factors." All period references are to our fiscal periods unless otherwise indicated.

#### Corporate Information

Micron Technology, Inc., a Delaware corporation, was incorporated in 1978. As used herein, "we," "our," "us" and similar terms include Micron Technology, Inc. and its subsidiaries, unless the context indicates otherwise. Our executive offices are located at 8000 South Federal Way, Boise, Idaho 83716-9632 and our telephone number is (208) 368-4000. Information about us is available on the internet at [www.micron.com](http://www.micron.com). Copies of our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as any amendments to these reports, are available through the our website as soon as reasonably practicable after they are electronically filed with or furnished to the Securities and Exchange Commission (the "SEC"). Materials filed by us with the SEC are also available at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information on the operation of the Public Reference Room is available by calling (800) SEC-0330. Also available on our website are our: Corporate Governance Guidelines, Governance Committee Charter, Compensation Committee Charter, Audit Committee Charter and Code of Business Conduct and Ethics. Any amendments or waivers of our Code of Business Conduct and Ethics will also be posted on our website at [www.micron.com](http://www.micron.com) within four business days of the amendment or waiver. Copies of these documents are available to shareholders upon request. Information contained or referenced on our website is not incorporated by reference and does not form a part of this Annual Report on Form 10-K.

#### Overview

We are a global manufacturer and marketer of semiconductor devices, principally DRAM, NAND Flash and NOR Flash memory, as well as other innovative memory technologies, packaging solutions and semiconductor systems for use in leading-edge computing, consumer, networking, automotive, industrial and mobile products. In addition, we manufacture semiconductor components for CMOS image sensors and other semiconductor products. We market our products through our internal sales force, independent sales representatives and distributors primarily to original equipment manufacturers and retailers located around the world. Our success is largely dependent on the market acceptance of our diversified portfolio of semiconductor products, efficient utilization of our manufacturing infrastructure, successful ongoing development of advanced process technologies and the return on research and development investments.

We obtain products from three primary sources: (1) production from our wholly-owned manufacturing facilities, (2) production from our joint venture manufacturing facilities and (3) to a lesser degree from third party manufacturers. In recent years, we have increased our manufacturing scale and product diversity through strategic acquisitions and various partnering arrangements, including joint ventures, which have helped us to attain lower costs

than we could otherwise achieve through internal investments alone.

We have made significant investments to develop the proprietary product and process technology that is implemented in our worldwide manufacturing facilities and through our joint ventures to enable the production of semiconductor products with increasing functionality and performance at lower costs. We generally reduce the manufacturing cost of each generation of product through advancements in product and process technology such as our leading-edge line-width process technology and innovative array architecture. We continue to introduce new generations of products that offer improved performance characteristics, such as higher data transfer rates, reduced package size, lower power consumption and increased memory density. To leverage our significant investments in research and development, we have formed various strategic joint ventures that have allowed us to share the costs of developing memory product and process technologies with our joint venture partners. In addition, from time to time, we have also sold and/or licensed technology to other parties. We continue to pursue additional opportunities to monetize our investment in intellectual property through partnering and other arrangements.

In the second quarter of 2011, we reorganized our business to better align with the markets we serve. All prior period amounts have been retrospectively adjusted to reflect this reorganization. After the reorganization, we have the following four reportable segments:

DRAM Solutions Group ("DSG"): Includes high-volume DRAM products sold to the PC, consumer electronics, networking and server markets.

NAND Solutions Group ("NSG"): Includes high-volume NAND Flash products sold into data storage, personal music players, and portions of computing markets, as well as NAND Flash products sold to Intel Corporation ("Intel") through our consolidated IM Flash joint ventures.

Wireless Solutions Group ("WSG"): Includes DRAM, NAND Flash and NOR Flash products, including multi-chip packages, sold to the mobile device market.

Embedded Solutions Group ("ESG"): Includes DRAM, NAND Flash and NOR Flash products sold into automotive and industrial applications, as well as NOR and NAND Flash sold to consumer electronics, networking, PC and server markets.

Our other operations do not meet the quantitative thresholds of a reportable segment and are reported under All Other. All Other includes our CMOS image sensor, LED, microdisplay and solar operations.

## Products

Over the past several years we have been focused on diversifying our product portfolio beyond DRAM products, which historically had constituted a substantial majority of our sales. In 2011, sales of DRAM products were less than half our total sales and in the fourth quarter of 2011 sales of NAND Flash products exceeded sales of DRAM products for the first time in our history.

### Dynamic Random Access Memory ("DRAM")

DRAM products are high-density, low-cost-per-bit, random access memory devices that provide high-speed data storage and retrieval. DRAM products were 41%, 60% and 50% of our total net sales in 2011, 2010 and 2009, respectively. DRAM products are sold by the DSG, WSG and ESG segments. We offer DRAM products with a variety of performance, pricing and other characteristics including high-volume DDR3 and DDR2 products as well as specialty DRAM memory products including Mobile Low Power DRAM ("LPDRAM"), DDR, SDRAM, Reduced Latency DRAM ("RLDRAM") and Pseudo-static DRAM ("PSRAM").

DDR3 and DDR2: DDR3 and DDR2 are standardized, high-density, high-volume DRAM products that are sold primarily for use as main system memory in computers and servers. DDR3 and DDR2 products offer high speed and high bandwidth at a relatively low cost compared to other DRAM products. DDR3 products were 21%, 22% and 7% of our total net sales in 2011, 2010 and 2009, respectively. DDR2 products were 10%, 24% and 22% of our total net

sales in 2011, 2010 and 2009, respectively.

We offer DDR3 products in 1 gigabit ("Gb"), 2Gb and 4 Gb densities and DDR2 products in 256 megabit ("Mb"), 512 Mb, 1 gigabit and 2 Gb densities. We expect these densities will be necessary to meet future customer demands for a broad array of products and offer these products in multiple configurations, speeds and package types.

Specialty DRAM products: We also offer DRAM memory products including DDR and DDR2 Mobile LPDRAM, DDR, SDRAM, RDRAM and PSRAM in densities ranging from 64 Mb to 2 Gb. LPDRAM products are used primarily in laptop computers, tablets, and other consumer devices that require low power consumption. Our other specialty DRAM products are used primarily in networking devices, servers, consumer electronics, communications equipment and computer peripherals as well as computer memory upgrades. Aggregate sales of LPDRAM and our other DRAM products were 10%, 14% and 21% of our total net sales in 2011, 2010 and 2009, respectively.

#### NAND Flash Memory ("NAND")

NAND products are electrically re-writeable, non-volatile semiconductor memory devices that retain content when power is turned off. NAND sales were 36%, 28% and 39% of our total net sales in 2011, 2010 and 2009, respectively. NAND products are sold by the NSG, WSG and ESG segments. NAND is ideal for mass-storage devices due to its fast erase and write times, high density, and low cost per bit relative to other solid-state memory. Removable storage devices, such as USB and Flash memory cards, are used with applications such as personal computers, digital still cameras, MP3/4 players and mobile phones. Embedded NAND-based storage devices are utilized in mobile phones, MP3/4 players, computers, solid-state drives ("SSDs"), tablets and other personal and consumer applications. The market for NAND products has grown rapidly and we expect it to continue to grow due to demand for these and other removable and embedded storage devices.

Our NAND products feature a small cell structure that enables higher densities for demanding applications. We offer Single-Level Cell ("SLC") NAND products and Multi-Level Cell ("MLC") NAND products, which have two or more times the bit density of SLC NAND products. In 2011, we offered SLC NAND products in 1 Gb, 2 Gb, 4 Gb and 8 Gb densities. In addition, we offered 8 Gb, 16 Gb, 32 Gb and 64 Gb 2-bit-per-cell MLC NAND products and 32 Gb and 64 Gb 3-bit-per-cell MLC NAND products. We offer high-speed NAND products that are compatible with advanced interfaces. We offer NAND Flash in multichip packages ("MCPs") that incorporate NAND Flash with other memory products to create a single package that simplifies design while improving performance and functionality.

We offer next-generation RealSSD™ solid-state drives for enterprise server and notebook applications which feature higher performance, reduced power consumption and enhanced reliability as compared to typical hard disk drives. Using our SLC and MLC NAND process technology, these SSDs are offered in 2.5-inch and 1.8-inch form factors, with densities up to 512 gigabytes. We also offer embedded USB devices with densities up to 16 gigabytes. We are sampling enterprise PCIe SSDs with capacities up to 700 gigabytes. We expect that demand for SSDs will continue to increase significantly over the next several years.

Through our Lexar™ brand, we sell high-performance digital media products and other flash-based storage products through retail and original equipment manufacturing ("OEM") channels. Our digital media products include a variety of flash memory cards and JumpDrive™ products with a range of speeds, capacities and value-added features. We offer flash memory cards in a variety of speeds and capacities and in all major media formats, including: CompactFlash, Memory Stick and Secure Digital ("SD"). CompactFlash and Memory Stick products sold by us incorporate our patented controller technology. Other products, including SD memory cards and some JumpDrive™ products, incorporate third party controllers. We sell products under our Lexar™ brand and manufacture products that are sold under other brand names. We also resell flash memory products that are purchased from other NAND Flash suppliers.

#### NOR Flash Memory ("NOR")

NOR products are electrically re-writeable, non-volatile semiconductor memory devices that retain content when power is turned off, offer fast read times due to random access capability and have execute-in-place ("XiP") capability that enables processors to read NOR without first accessing RAM. These capabilities make NOR ideal for storing program code in wireless and embedded applications. Our NOR sales originated from the May 7, 2010 acquisition of Numonyx and were 18% and 5% of our total net sales for 2011 and 2010, respectively. NOR products are sold by the WSG and ESG segments.

We offer both parallel and serial interface NOR products in a broad range of densities, packages, and features. Our parallel NOR products are constructed to meet the needs of the consumer electronics, industrial, wired and wireless communications, computing and automotive applications. These products offer high densities, XiP performance, architectural flexibility and proven reliability in rigorous industrial settings. Our serial NOR products are designed to meet the needs of consumer electronics, industrial, wired communications, and computing applications. These products offer industry-standard packaging, pinouts, command sets and chipset compatibility.



## Phase Change Memory ("PCM")

PCM is a new memory technology that combines the attributes of NOR, NAND and RAM, simplifying memory and producing more capabilities within a single chip. PCM is bit-alterable, non-volatile memory featuring fast read/write/erase speeds that is highly scalable to lower line-width technologies. We currently offer both parallel and serial interface PCM products and expect that the market for these products will increase significantly in the next several years.

## Partnering Arrangements

The following is a summary of our partnering arrangements as of September 1, 2011:

|                            |     | Partner(s)                                      | Approximate Micron<br>Ownership Interest | Formed/<br>Acquired | Product Market     |
|----------------------------|-----|---|--|---------------------|--------------------|
| Consolidated Entities:     |     |   |  |                     |                    |
| IMFT                       | (1) | Intel Corporation                               | 51                                       | % 2006              | NAND Flash         |
| IMFS                       | (1) | Intel Corporation                               | 86                                       | % 2007              | NAND Flash         |
| MP Mask                    | (2) | Photronics, Inc.                                | 50                                       | % 2006              | Photomasks         |
| Equity Method Investments: |     |   |  |                     |                    |
| Inotera                    | (3) | Nanya Technology Corporation                    | 30                                       | % 2009              | DRAM               |
| MeiYa                      | (3) | Nanya Technology Corporation                    | 50                                       | % 2008              | DRAM               |
| Transform                  | (4) | Origin Energy Limited                           | 50                                       | % 2010              | Solar Panels       |
| Aptina                     | (5) | Riverwood Capital LLC and TPG Partners VI, L.P. | 35                                       | % 2009              | CMOS Image Sensors |

IM Flash: We partner with Intel Corporation ("Intel") for the design, development and manufacture of NAND Flash products. In connection therewith, we have formed two joint ventures with Intel to manufacture NAND Flash memory products for the exclusive benefit of the partners: IM Flash Technologies, LLC ("IMFT") and IM Flash Singapore LLP ("IMFS") (collectively, "IM Flash"). As of September 1, 2011, we owned an approximate 51% interest in IMFT and an approximate 86% interest in IMFS with the remaining interests held by Intel. Our ownership interest in IMFS increased from 51% prior to the second quarter of 2010 to 86% on September 1, 2011 as Intel did not match our capital contributions. On September 26, 2011, Intel participated in a capital call of IMFS (1) by contributing \$131 million. After that capital call, our ownership interest in IMFS was reduced to 82%. The partners share the output of IM Flash generally in proportion to their investment in IM Flash. We sell NAND Flash products to Intel through IM Flash at long-term negotiated prices approximating cost. We generally share product design and other research and development costs equally with Intel. In 2011, IM Flash began ramping production at a new Singapore wafer fabrication facility and we expect that output from this facility will significantly increase our overall NAND Flash production in 2012. (See "Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Consolidated Variable Interest Entities – NAND Flash joint ventures with Intel" note.)

MP Mask: We produce photomasks for leading-edge and advanced next generation semiconductors through MP Mask Technology Center, LLC ("MP Mask"), a joint venture with Photronics, Inc. ("Photronics"). We and (2) Photronics also have supply arrangements wherein we purchase a substantial majority of the reticles produced by MP Mask. (See "Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Consolidated Variable Interest Entities – MP Mask Technology Center, LLC." note.)

Inotera and MeiYa: We partner with Nanya Technology Corporation ("Nanya") for the design, development and manufacture of stack DRAM products, including the joint development of DRAM process technology. In connection therewith, we have partnered with Nanya in two Taiwan DRAM memory companies, Inotera Memories, Inc. ("Inotera") and MeiYa Technology Corporation ("MeiYa"). We have a supply agreement with Inotera and Nanya which gives us the right and obligation to purchase 50% of Inotera's semiconductor memory capacity subject to specific terms and conditions. Under the formula for this supply agreement, all parties' manufacturing costs related to wafers supplied by Inotera, as well as our and Nanya's revenue for the resale of products from wafers supplied by Inotera, are considered in determining costs for wafers from Inotera. Inotera (3) accounted for 37% of our DRAM gigabit production in the fourth quarter of 2011. We also partner with Nanya to jointly develop process technology and designs to manufacture stack DRAM products. In connection with the partnering agreement, we have also deployed and licensed certain intellectual property related to the manufacture of stack DRAM products to Nanya and licensed certain intellectual property from Nanya. Under a cost-sharing arrangement effective beginning in April 2010, we generally share DRAM development costs equally with Nanya. In addition, in 2010 we began receiving royalties from Nanya for sales of stack DRAM products manufactured by or for Nanya with technology developed prior to April 2010. (See "Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Equity Method Investments – Inotera and MeiYa DRAM Joint Ventures with Nanya" note.)

Transform: On December 18, 2009, we acquired a 50% interest in Transform Solar Pty Limited ("Transform"), a subsidiary of Origin Energy Limited ("Origin") in exchange for nonmonetary assets with a fair value of \$65 million, consisting of manufacturing facilities, equipment, intellectual property and a fully-paid lease to a portion (4) of our Boise, Idaho manufacturing facilities. Transform develops and manufactures photovoltaic solar panels. (See "Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Equity Method Investments – Transform" note.)

Aptina: We manufacture CMOS image sensor products for Aptina under a wafer supply agreement. We own 64% of Aptina's common stock and none of their preferred stock resulting in a total ownership interest in Aptina of (5) 35%. Our investment in Aptina is accounted for as an equity method investment, in which we recognize our share of Aptina's results of operations based on our 64% share of Aptina's common stock. (See "Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Equity Method Investments – Aptina" note.)

## Manufacturing

Our manufacturing facilities are located in the United States, China, Israel, Italy, Malaysia, Puerto Rico and Singapore. Our Inotera joint venture also has a wafer fabrication facility in Taiwan. In 2011, we sold our wafer fabrication facility in Japan to Tower Semiconductor Ltd. ("Tower") and entered into a supply agreement for Tower to manufacture products for us in the facility through approximately May 2014. Our manufacturing facilities generally operate 24 hours per day, 7 days per week. Semiconductor manufacturing is extremely capital intensive, requiring large investments in sophisticated facilities and equipment. A significant portion of our semiconductor equipment is replaced every three to five years with increasingly advanced equipment. DRAM, NAND and NOR share common manufacturing processes, enabling us to leverage our product and process technologies and manufacturing infrastructure across these product lines.

Our process for manufacturing semiconductor products is complex, involving a number of precise steps, including wafer fabrication, assembly and test. Efficient production of semiconductor products requires utilization of advanced semiconductor manufacturing techniques and effective deployment of these techniques across multiple facilities. The primary determinants of manufacturing cost are die size, number of mask layers, number of fabrication steps and number of good die produced on each wafer. Other factors that contribute to manufacturing costs are wafer size, cost

and sophistication of manufacturing equipment, equipment utilization, process complexity, cost of raw materials, labor productivity, package type and cleanliness of the manufacturing environment. We continuously enhance our production processes, reducing die sizes and transitioning to higher density products. In 2011, we transitioned the majority of our DRAM production to 42nm line-width process technology and began transitioning to 30nm line-width process technology. In 2011 most of our NAND Flash memory products were manufactured on our 25nm line-width process technology and we expect to continue transitioning to 20nm line-width process technology in 2012. In 2011, we manufactured all of our NAND Flash and our high-volume DRAM products on 300mm wafers. We manufactured NOR Flash, some specialty DRAM and CMOS image sensor products on 200mm wafers. In 2011, the majority of our NOR Flash memory products were manufactured on our 65nm line-width process technology and we expect to continue transitioning to 45nm line-width technology in 2012.

Wafer fabrication occurs in a highly controlled, clean environment to minimize dust and other yield- and quality-limiting contaminants. Despite stringent manufacturing controls, equipment errors, minute impurities in materials, defects in photomasks, circuit design marginalities or defects and dust particles can lead to wafers being scrapped and individual circuits being nonfunctional. Success of our manufacturing operations depends largely on minimizing defects to maximize yield of high-quality circuits. In this regard, we employ rigorous quality controls throughout the manufacturing, screening and testing processes. We are able to recover many nonstandard devices by testing and grading them to their highest level of functionality.

After fabrication, most silicon wafers are separated into individual die. We sell semiconductor products in both packaged and unpackaged (i.e. "bare die") forms. For packaged products, functional die are sorted, connected to external leads and encapsulated in plastic packages. We assemble products in a variety of packages, including TSOP (thin small outline package), TQFP (thin quad flat package) and FBGA (fine pitch ball grid array). Bare die products address customer requirements for smaller form factors and higher memory densities and provide superior flexibility for use in packaging technologies such as systems-in-a-package (SIPs) and multi-chip packages (MCPs), which reduce the board area required.

We test our products at various stages in the manufacturing process, perform high temperature burn-in on finished products and conduct numerous quality control inspections throughout the entire production flow. In addition, we use our proprietary AMBYX™ line of intelligent test and burn-in systems to perform simultaneous circuit tests of DRAM die during the burn-in process, capturing quality and reliability data and reducing testing time and cost.

We assemble a significant portion of our memory products into memory modules. Memory modules consist of an array of memory components attached to printed circuit boards ("PCBs") that insert directly into computer systems or other electronic devices. We also contract with independent foundries and assembly and testing organizations to manufacture Lexar-brand flash media products such as memory cards and USB devices.

We utilize subcontractors to perform a significant portion of our assembly and module assembly services. Outsourcing these services enables us to reduce costs and minimize our capital investment.

In recent years, we have produced an increasingly broad portfolio of products, which enhances our ability to allocate resources to our most profitable products but also increases the complexity of our manufacturing process. Although our product lines generally use similar manufacturing processes, our overall cost efficiency can be affected by frequent conversions to new products, the allocation of manufacturing capacity to more complex, smaller-volume parts and the reallocation of manufacturing capacity across various product lines.

#### NAND Flash Joint Ventures with Intel Corporation

Our IM Flash joint ventures with Intel manufacture NAND Flash memory products for the exclusive benefit of the partners. We share the output of IM Flash with Intel generally in proportion to our and Intel's investment in IM Flash. In 2011, IM Flash began ramping production at a new Singapore wafer fabrication facility and we expect that output from this facility will significantly increase our overall NAND Flash production in 2012.

#### Inotera

Under a supply agreement with Inotera, we have the right and obligation to obtain 50% of Inotera's total capacity of approximately 130,000 300mm DRAM wafer starts per month as of September 1, 2011. Inotera accounted for 33% of our DRAM gigabit production in 2011.

#### MP Mask

We produce photomasks for leading-edge and advanced next generation semiconductors through MP Mask. We and Photronics also have supply arrangements wherein we have agreed to purchase a substantial majority of the reticles produced by MP Mask.

#### Aptina Supply Agreement

We manufacture CMOS image sensor products for Aptina under a wafer supply agreement.

(See "Partnering Arrangements")

### Availability of Raw Materials

Our production processes require raw materials that meet exacting standards, including several that are customized for, or are unique to, us. We generally have multiple sources and sufficient availability of supply. However, only a limited number of suppliers are capable of delivering certain raw materials that meet our standards. In some cases, materials are provided by a single supplier. Various factors could reduce the availability of raw materials such as silicon wafers, photomasks, chemicals, gases, photoresist, lead frames, molding compound and other materials. Shortages may occur from time to time in the future. In addition, transportation problems could delay our receipt of raw materials. Lead times for the supply of raw materials have been extended in the past. If our supply of raw materials is interrupted or our lead times extended, our results of operations or financial condition could be adversely affected.

### Marketing and Customers

Our products are sold into computing, consumer, networking, telecommunications, automotive, industrial and imaging markets. Market concentrations from 2011 net sales were approximately as follows: computing (including desktop PCs, servers, notebooks and workstations), 30%; mobile, 25%; consumer electronics, 15%; and networking and storage, 15%. Sales to Intel, primarily of NAND Flash from our IM Flash joint ventures, were 10% of our net sales in 2011, 9% of our net sales in 2010, and 20% of our net sales in 2009. Sales to Hewlett-Packard Company, primarily of DRAM, were 9% of our net sales in 2011 and 13% of our net sales in 2010.

Our semiconductor memory products are offered under the Micron, Lexar®, Crucial™, SpecTek® and Numonyx® brand names and private labels. We market our semiconductor memory products primarily through our own direct sales force and maintain sales offices in our primary markets around the world. We sell Lexar-branded NAND Flash memory products primarily through retail channels and our Crucial™-branded products through a web-based customer direct sales channel as well as channel and distribution partners. Our products are also offered through independent sales representatives and distributors. Independent sales representatives obtain orders subject to final acceptance by us and are compensated on a commission basis. We make shipments against these orders directly to the customer. Distributors carry our products in inventory and typically sell a variety of other semiconductor products, including competitors' products. We maintain inventory at locations in close proximity to certain key customers to facilitate rapid delivery of products.

We offer products designed to meet the diverse needs of computing, server, automotive, networking, commercial/industrial, consumer electronics, mobile, embedded, security and medical applications. Many of our customers require a thorough review or qualification of semiconductor products, which may take several months.

### Backlog

Because of volatile industry conditions, customers are reluctant to enter into long-term, fixed-price contracts. Accordingly, new order volumes for our semiconductor products fluctuate significantly. We typically accept orders with acknowledgment that the terms may be adjusted to reflect market conditions at the date of shipment. For these reasons, we do not believe that our order backlog as of any particular date is a reliable indicator of actual sales for any succeeding period.

### Product Warranty

Because the design and manufacturing process for semiconductor products is highly complex, it is possible that we may produce products that do not comply with customer specifications, contain defects or are otherwise incompatible

with end uses. In accordance with industry practice, we generally provide a limited warranty that our products are in compliance with our specifications existing at the time of delivery. Under our general terms and conditions of sale, liability for certain failures of product during a stated warranty period is usually limited to repair or replacement of defective items or return of, or a credit with respect to, amounts paid for such items. Under certain circumstances, we provide more extensive limited warranty coverage than that provided under our general terms and conditions.

## Competition

We face intense competition in the semiconductor memory markets from a number of companies, including Elpida Memory, Inc.; Hynix Semiconductor Inc.; Samsung Electronics Co., Ltd; SanDisk Corporation; Spansion Inc. and Toshiba Corporation. Some of our competitors are large corporations or conglomerates that may have greater resources to withstand downturns in the semiconductor markets in which we compete, invest in technology and capitalize on growth opportunities. Our competitors seek to increase silicon capacity, improve yields, reduce die size and minimize mask levels in their product designs resulting in significantly increased worldwide supply and downward pressure on prices. Many of our high-volume memory products are manufactured to industry standard specifications, and as such, have similar performance characteristics to our competitors. For these high-volume memory products, the principal competitive factors are generally price and performance characteristics including: operating speed, power consumption, reliability, compatibility, size and form factors. For our other memory products, the aforementioned performance characteristics generally take precedent to pricing.

## Research and Development

Our process technology research and development ("R&D") efforts are focused primarily on development of successively smaller line-width process technologies, which are designed to facilitate our transition to next generation memory products. Additional process technology R&D efforts focus on advanced computing and mobile memory architectures, the investigation of new opportunities that leverage our core semiconductor expertise and the development of new manufacturing materials. Product design and development efforts are concentrated on our high density DDR3 DRAM and LP-DDR2 mobile LPDRAM products as well as high density and mobile NAND Flash memory (including multi-level cell technology), NOR Flash memory, specialty memory, PCM and other next-generation memories and memory systems.

Our R&D expenses were \$791 million, \$624 million and \$647 million in 2011, 2010 and 2009, respectively. We generally share R&D process and design costs for NAND Flash equally with Intel and for DRAM equally with Nanya. As a result of reimbursements under our NAND Flash and DRAM cost sharing arrangements with our joint venture partners, our overall R&D expenses were reduced by \$236 million, \$155 million and \$107 million in 2011, 2010 and 2009, respectively.

To compete in the semiconductor memory industry, we must continue to develop technologically advanced products and processes. We believe that expansion of our semiconductor product offerings is necessary to meet expected market demand for specific memory solutions. Our process development center and largest design center are located at our corporate headquarters in Boise, Idaho. In 2011, we began construction of a new 450mm-wafer capable R&D facility in Boise which we expect will be ready for tool installations in the beginning of calendar year 2012. We have several additional product design centers in other strategic locations around the world. In addition, we develop leading edge photolithography mask technology at our MP Mask joint venture facility in Boise.

R&D expenses vary primarily with the number of development wafers processed, the cost of advanced equipment dedicated to new product and process development, and personnel costs. Because of the lead times necessary to manufacture our products, we typically begin to process wafers before completion of performance and reliability testing. We deem development of a product complete once the product has been thoroughly reviewed and tested for performance and reliability. R&D expenses can vary significantly depending on the timing of product qualification.

## Geographic Information



Sales to customers outside the United States totaled \$7.4 billion for 2011 and included \$3.0 billion in sales to China, \$924 million in sales to Europe, \$744 million in sales to Taiwan, \$737 million in sales to Malaysia and \$1.5 billion in sales to the rest of the Asia Pacific region (excluding China, Malaysia and Taiwan). Sales to customers outside the United States totaled \$7.1 billion for 2010 and \$3.9 billion for 2009. As of September 1, 2011, we had net property, plant and equipment of \$3.6 billion in Singapore, \$3.5 billion in the United States, \$190 million in Italy, \$179 million in China, \$94 million in Israel, and \$36 million in other countries. (See "Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Geographic Information" note and "Item 1A. Risk Factors.")

## Patents and Licenses

In recent years, we have been recognized as a leader in per capita and quality of patents issued. As of September 1, 2011, we owned approximately 17,100 U.S. patents and 3,200 foreign patents. In addition, we have numerous U.S. and foreign patent applications pending. Our patents have various terms expiring through 2030.

We have a number of patent and intellectual property license agreements. Some of these license agreements require us to make one-time or periodic payments. We may need to obtain additional patent licenses or renew existing license agreements in the future. We are unable to predict whether these license agreements can be obtained or renewed on acceptable terms.

In recent years, we have recovered some of our investment in technology through sales or licenses of intellectual property rights to joint venture partners and other third parties. We are pursuing additional opportunities to recover our investment in intellectual property through additional sales or licenses of intellectual property and potential partnering arrangements.

## Employees

As of September 1, 2011, we had approximately 26,100 employees, of which approximately 15,500 were outside the United States, including approximately 7,600 in Singapore, 3,300 in Italy, 1,700 in China, 1,300 in Israel and 1,000 in Malaysia. Our employees include approximately 2,800 in our IM Flash joint ventures, primarily located in the United States and Singapore. Our employment levels can vary depending on market conditions and the level of our production, research and product and process development. Many of our employees are highly skilled and our continued success depends in part upon our ability to attract and retain such employees. The loss of key personnel could have a material adverse effect on our business, results of operations or financial condition.

## Environmental Compliance

Government regulations impose various environmental controls on raw materials and discharges, emissions and solid wastes from our manufacturing processes. In 2011, our wholly-owned wafer fabrication facilities continued to conform to the requirements of ISO 14001 certification. To continue certification, we met annual requirements in environmental policy, compliance, planning, management, structure and responsibility, training, communication, document control, operational control, emergency preparedness and response, record keeping and management review. While we have not experienced any materially adverse effects to our operations from environmental regulations, changes in the regulations could necessitate additional capital expenditures, modification of our operations or other compliance actions.

## Directors and Executive Officers of the Registrant

Our officers are appointed annually by the Board of Directors and our directors are elected annually by our shareholders. Any directors appointed by the Board of Directors to fill vacancies on the Board serve until the next election by the shareholders. All officers and directors serve until their successors are duly chosen or elected and qualified, except in the case of earlier death, resignation or removal.

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As of September 1, 2011, the following executive officers and directors were subject to the reporting requirements of Section 16(a) of the Securities Exchange Act of 1934, as amended.

| Name               | Age | Position   |
|--------------------|-----|--|
| Mark W. Adams      | 47  | Vice President of Worldwide Sales  |
| Steven R. Appleton | 51  | Chairman and Chief Executive Officer                                     |
| D. Mark Durcan     | 50  | President and Chief Operating Officer                                    |
| Thomas T. Eby      | 50  | Vice President of Embedded Solutions                                     |
| Ronald C. Foster   | 61  | Vice President of Finance and Chief Financial Officer                    |
| Glen W. Hawk       | 49  | Vice President of NAND Solutions   |
| Roderic W. Lewis   | 56  | Vice President of Legal Affairs, General Counsel and Corporate Secretary |
| Mario Licciardello | 69  | Vice President of Wireless Solutions                                     |
| Patrick T. Otte    | 49  | Vice President of Human Resources  |
| Brian J. Shields   | 49  | Vice President of Worldwide Operations                                   |
| Brian M. Shirley   | 42  | Vice President of DRAM Solutions   |
| Teruaki Aoki       |     |  |