PHOTRONICS INC
Form 10-K
December 20, 2017

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended October 29, 2017

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 0-15451

PHOTRONICS, INC.
(Exact name of registrant as specified in its charter)

Connecticut	06-0854886
(State or other jurisdiction of incorporation or organization)	(IRS Employer Identification No.)

15 Secor Road, Brookfield, Connecticut 06804
(Address of principal executive offices)(Zip Code)
(203) 775-9000
(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, $.01 par value	NASDAQ Global Select Market

Securities registered pursuant to Section 12(g) of the Act:
None

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

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

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, 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 No

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.

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 definition of "accelerated filer," "large accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.
Large Accelerated Filer Accelerated Filer Non-Accelerated Filer Smaller Reporting Company
Emerging growth company

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

As of April 30, 2017, which was the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of the shares of the registrant's common stock held by non-affiliates was approximately $777,531,974 (based upon the closing price of $11.50 per share as reported by the NASDAQ Global Select Market on that date).

As of December 15, 2017, 69,052,587 shares of the registrant's common stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Proxy Statement for the 2018 Annual Meeting of Shareholders to be held in March 22, 2018	Incorporated into Part III of this Form 10-K

Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 provides a “safe harbor” for forward-looking statements made by or on behalf of Photronics, Inc. (“Photronics”, the “Company”, “we”, “our”, or “us”). These statements are based on management’s beliefs, as well as assumptions made by, and information currently available to, management. Forward-looking statements may be identified by words like “expect,” “anticipate,” “believe,” “plan,” “project,” “could,” “esti “intend,” “may,” “will” and similar expressions, or the negative of such terms, or other comparable terminology. All forward-looking statements involve risks and uncertainties that are difficult to predict. In particular, any statement contained in this annual report on Form 10-K or in other documents filed with the Securities and Exchange Commission in press releases or in the Company’s communications and discussions with investors and analysts in the normal course of business through meetings, phone calls, or conference calls regarding, among other things, the consummation and benefits of transactions, joint ventures, business combinations, divestitures and acquisitions, expectations with respect to future sales, financial performance, operating efficiencies, or product expansion, are subject to known and unknown risks, uncertainties, and contingencies, many of which are beyond the control of the Company. Various factors may cause actual results, performance, or achievements to differ materially from anticipated results, performance, or achievements expressed or implied by forward-looking statements. Factors that might affect forward-looking statements include, but are not limited to, overall economic and business conditions; economic and political conditions in international markets; the demand for the Company’s products; competitive factors in the industries and geographic markets in which the Company competes; the timing of orders received from customers; the gain or loss of significant customers; competition from other manufacturers; changes in accounting standards; federal, state and international tax requirements (including tax rate changes, new tax laws and revised tax law interpretations); changes in the jurisdictional mix of our earnings and changes in tax laws and rates; interest rate and other capital market conditions, including changes in the market price of the Company’s securities; foreign currency exchange rate fluctuations; changes in technology; technology or intellectual property infringement, including cyber-security breaches, and other innovation risks; unsuccessful or unproductive research and development or capital expenditures; the timing, impact, and other uncertainties related to transactions and acquisitions, divestitures, business combinations, and joint ventures as well as decisions the Company may make in the future regarding the Company’s business, capital and organizational structures and other matters; the seasonal and cyclical nature of the semiconductor and flat panel display industries; management changes; changes in laws and government regulation impacting our operations or our products; the occurrence of regulatory proceedings, claims or litigation; damage or destruction to the Company’s facilities, or the facilities of its customers or suppliers, by natural disasters, labor strikes, political unrest, or terrorist activity; the ability of the Company to (i) place new equipment in service on a timely basis; (ii) obtain additional financing; (iii) achieve anticipated synergies and cost savings; (iv) fully utilize its tools; (v) achieve desired yields, pricing, product mix, and market acceptance of its products and (vi) obtain necessary export licenses. Any forward-looking statements should be considered in light of these factors. Accordingly, there is no assurance that the Company’s expectations will be realized. The Company does not assume responsibility for the accuracy and completeness of the forward-looking statements and does not assume an obligation to provide revisions to any forward-looking statements, except as otherwise required by securities and other applicable laws.

PART I

ITEM 1. BUSINESS

General

Photronics, Inc. (and its subsidiaries, collectively referred to herein as "Photronics", the "Company", "we", "our", or "us") is o
of the world's leading manufacturers of photomasks, which are high precision photographic quartz or glass plates containing microscopic images of electronic circuits. Photomasks are a key element in the manufacture of semiconductors and flat panel displays ("FPDs"), and are used as masters to transfer circuit patterns onto semiconductor wafers and flat panel display substrates during the fabrication of integrated circuits ("ICs" or "semiconductors") and a variety of FPDs and, to a lesser extent, other types of electrical and optical components. The Company currently operates principally from nine manufacturing facilities; two of which are located in Europe, three in Taiwan, one in Korea and three in the United States. We have announced plans to construct two manufacturing facilities in China, as we expand our global manufacturing footprint. See Note 19 to the consolidated financial statements for additional information.

Photronics is a Connecticut corporation, organized in 1969. Our principal executive offices are located at 15 Secor Road, Brookfield, Connecticut 06804, telephone (203) 775-9000. Our website address is http://www.photronics.com. We make available, free of charge through our website, our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any amendments to these reports as soon as reasonably practicable after such materials are electronically filed with, or furnished to, the Securities and Exchange Commission ("SEC"). The information found on, or incorporated into, our website is not part of this or any other report we file with or furnish to the SEC. These reports may also be obtained at the SEC's Public Reference Room at 100 F Street, N.E., Washington, DC 20549. Investors may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC also maintains a website at http://www.sec.gov that contains reports, proxy statements and other information regarding SEC registrants, including Photronics.

The Board has adopted a code of ethics, which is posted on the Company's website at http://www.photronics.com/plab/photronics/. The code of ethics may be found as follows: from the Company's web address listed above, first click on "Investors" then click on "Corporate Governance", then on "Photronics, Inc. Code of Ethics". The Company's code of ethics applies to the Company's senior financial officers, including our Chief Executive Officer; Senior Vice President and Chief Financial Officer; Chief Financial Officer, Asia; Vice President and Treasurer; Vice President, Corporate Controller; and Vice President, Tax. We intend to disclose any amendment to, or waiver from, the code of ethics for our senior financial officers, including our principal executive officer, principal financial officer, principal accounting officer or controller or persons performing similar functions, to the extent disclosure is required by applicable rules of the SEC and NASDAQ Stock Market LLC by posting such information on our website, at the address and location specified above.

Products and Manufacturing Technology

We manufacture photomasks, which are used as masters to transfer circuit patterns onto semiconductor wafers and flat panel display substrates. Photomasks are manufactured in accordance with circuit designs provided to us on a confidential basis by our customers. IC and FPD photomask sets are manufactured in layers, each having a distinct pattern which is etched onto a different photomask. The resulting series of photomasks is then used to image the circuit patterns onto each successive layer of a semiconductor wafer or flat panel display substrate. The typical manufacturing process for a photomask involves the receipt and conversion of circuit design data to manufacturing pattern data. A lithography system then exposes the circuit pattern onto the photomask blank. The exposed areas are developed and etched to produce that pattern on the photomask. The photomask is then inspected for defects and conformity to the customer's design data. After any defects are repaired, the photomask is cleaned, any required pellicles (protective translucent cellulose membranes) are applied and, after final inspection, the photomask is shipped

to the customer.

We currently support customers across the full spectrum of IC production and FPD technologies by manufacturing photomasks using electron beam or optical (laser-based) systems, which are the predominant technologies used for photomask manufacturing, and are capable of producing the finer line resolution, tighter overlay and larger die size for the larger and more complex circuits currently being designed. Electron beam and laser generated photomasks can be used to produce the most advanced semiconductors and FPDs for use in an array of products. However, in the case of IC production, the large majority of higher cost critical layer photomasks are fabricated using electron beam technologies, while photomasks produced using laser-based systems are less expensive and less precise. End markets served with IC photomasks include devices used for microprocessors, memory, telecommunications and related applications. We currently own a number of both high-end and mature electron beam and laser-based systems.

The first several layers of photomasks are sometimes required to be delivered by us within 24 hours from the time we receive customers' design data. The ability to manufacture high quality photomasks within short time periods is dependent upon robust processes, efficient manufacturing methods, high production yield, available manufacturing capacity and high equipment reliability. We work to meet these requirements by making significant investments in research and development, capital equipment, manufacturing and data processing systems, and by utilizing statistical process control methods to optimize our manufacturing processes and reduce cycle times.

Quality control is an integral part of the photomask manufacturing process. Photomasks are manufactured in temperature, humidity, and particulate-controlled clean rooms because of the high level of precision, quality and manufacturing yield required. Each photomask is inspected several times during the manufacturing process to ensure compliance with customer specifications. We continue to make substantial investments in equipment to inspect and repair photomasks to ensure that customer specifications are met.

The majority of IC photomasks produced for the semiconductor industry employ geometries of larger than 45 nanometers. At these geometries, we can produce full lines of photomasks and there is no significant technology employed by our competitors that is not also available to us. We are also capable of producing full lines of photomasks for high-end IC and FPD applications. In the case of ICs, this includes photomasks at and below the 45 nanometer technology node and, for FPDs, at and above the Generation 8 technology node and active-matrix organic light-emitting diode (AMOLED) display screens. We hold customer-qualified manufacturing capability and own, or have access to, technology that enables us to compete in the high-end markets that serve IC and FPD applications.

Sales and Marketing

The market for photomasks primarily consists of domestic and non-US semiconductor and FPD manufacturers and designers. Photomasks are manufactured by independent merchant manufacturers like Photronics, and by semiconductor and FPD manufacturers that produce photomasks for their own use (captive manufacturers). In some instances, captive manufacturers also sell to other semiconductor or FPD manufacturers. Previously there was a trend towards the divesture or closing of captive photomask operations by semiconductor manufacturers and an increase in the share of the market served by independent manufacturers. This trend was driven by the increased complexity and cost of capital equipment used in manufacturing photomasks and the lack of economy of scale for many semiconductor and FPD manufacturers to effectively utilize the equipment. However, more recently, the remaining and largest captive mask facilities have started investing at faster rates than independent manufacturers to reach certain roadmap milestones, particularly in the foundry logic and memory spaces. Nevertheless, most captive manufacturers maintain business and technology relationships with independent photomask manufacturers for ongoing support.

Generally, Photronics and each of its customers engage in a qualification and correlation process before one becomes an approved supplier. Thereafter, based on the customer’s expectations, we typically negotiate pricing parameters for a customer’s orders. Some prices may remain in effect for an extended period of time. In some instances, we enter into sales arrangements with an understanding that, as long as our performance is competitive, we will receive a specified percentage of that customer’s photomask requirements.

We conduct our sales and marketing activities primarily through a staff of full-time sales personnel and customer service representatives who work closely with the Company’s management and technical personnel. We support non-US customers through both our domestic and foreign facilities. We consider our presence in non-US markets to be an important factor in attracting new customers, as it provides global solutions to our customers, minimizes delivery time, and allows us to serve customers that utilize manufacturing foundries outside of the United States, principally in Asia. See Note 13 to our consolidated financial statements for the amount of revenues and long-lived assets attributable to each of our geographic areas of operations.

Customers

We primarily sell our products to leading semiconductor and FPD manufacturers. During fiscal year 2017, we sold our products to approximately 600 customers. Revenue from United Microelectronics Corp. accounted for approximately 16%, 17% and 15% of our total revenues, and sales to Samsung Electronics Co. Ltd. accounted for approximately 16%, 19% and 18% of our total revenues in fiscal years 2017, 2016 and 2015, respectively. Our five largest customers, in the aggregate, accounted for approximately 43%, 50% and 52% of our revenue in fiscal years 2017, 2016 and 2015, respectively. A significant decrease in the amount of revenue from any of these customers could have

a material adverse effect on our financial performance and business prospects.

Seasonality

Our quarterly revenues can be affected by the seasonal purchasing patterns of our customers. We are typically impacted during our first quarter by the North American and European holiday periods, as some customers reduce their effective workdays and orders during this period. Additionally, we can be impacted during our first or second fiscal quarter by the Asian New Year holiday period, which also may reduce customer orders and deliveries.

Research and Development

We conduct research and development activities for IC photomasks at our U.S. nanoFab, which is located in Boise, Idaho, as well as at PK, Ltd. ("PKL"), our subsidiary in Korea and Photronics DNP Mask Corporation ("PDMC"), one of our subsidiaries in Taiwan. Research and development for FPD photomasks is conducted at PKL. Additionally, we conduct site-specific research and development programs to support strategic customers. These research and development programs and activities are undertaken to advance our competitiveness in technology and manufacturing efficiency. We also conduct application-oriented research and development activities to support the early adoption of new photomask or supporting data and services technology into our customers' applications. Currently, research and development photomask activities for ICs are focused on 20 nanometer node and below, and, for FPDs, on Generation 8 resolution enhancement, substrates larger than Generation 8 and more complex masks for AMOLED-type displays. We believe these core competencies will continue to be a critical part of semiconductor and FPD manufacturing, as optical lithography continues to scale capabilities on high-end devices. We incurred research and development expenses of $15.9 million, $21.7 million, and $21.9 million in fiscal years 2017, 2016, and 2015, respectively. It is our belief that we own, control, or license the proprietary information that is necessary for our business, as it is presently conducted. This includes trade secrets as well as patents. We also believe that our intellectual property and trade secret know-how will continue to be important to our maintaining technical leadership in the field of photomasks.

On May 5, 2016, we sold our investment in MP Mask to Micron for $93.1 million and recorded a gain on the sale of $0.1 million, which is included in our 2016 consolidated statements of income in interest income and other income (expense). On that same date, a supply agreement commenced between Photronics and Micron, which provided that we would be the majority outsourced supplier of Micron's photomasks and related services. The supply agreement had a one year term, and expired in May 2017. Photronics has unlimited rights to use the technology it acquired under its prior technology license agreement.

Patents and Trademarks

We have ownership interests in approximately 49 issued U.S. patents. The subject matter of these patents, which are registered in various countries, generally relates to the manufacture of IC photomasks or the use of photomasks to manufacture other products. The expiration dates of these patents range from 2018 to 2034. We also have a number of trademarks and trademark registrations in the United States and in other countries.

While we believe that our intellectual property is, and will continue to be, important to our technical leadership in the field of photomasks, our operations are not dependent on any one individual patent. We protect our intellectual property rights and proprietary processes by utilizing patents and non-disclosure agreements with employees, customers and vendors.

Materials, Supplies and Equipment

Raw materials used by Photronics generally include: high precision quartz plates (including large area plates), which are used as photomask blanks and are primarily obtained from Japanese and Korean suppliers; pellicles and electronic grade chemicals, which are used in the manufacturing process; and compacts, which are durable plastic containers in which photomasks are shipped. These materials are generally sourced from several suppliers. We believe that our utilization of a select group of strategic suppliers enables us to access the most technologically advanced materials

available. On an ongoing basis, we continue to consider additional supply sources.

We rely on a limited number of equipment suppliers to develop and supply the equipment used in the photomask manufacturing process. Although, historically, we have been able to obtain equipment on a timely basis, an inability to obtain equipment when required could adversely affect our business and results of operations.

Backlog

The first several layers of a set of photomasks for a circuit pattern are often required to be shipped within 24 hours of receiving a customer's designs. Because of the short period between order and shipment dates (typically from 1 day to 2 weeks) for a significant amount of our revenue, the dollar amount of our current backlog is not considered to be a reliable indicator of future revenue.

International Operations

Revenues from our non-U.S. operations were approximately 77%, 76% and 75% of our total revenues in fiscal 2017, 2016 and 2015, respectively. We believe that our ability to serve non-US markets is enhanced by our having, among other things, a local presence in the markets that we serve. This requires significant investments in financial, managerial, operational, and other resources.

Operations outside of the United States are subject to inherent risks, including fluctuations in exchange rates, political and economic conditions in various countries, legal compliance and regulatory requirements, tariffs and other trade barriers, difficulties in staffing and managing international operations, longer accounts receivable collection cycles, potential restrictions on transfers of funds and potentially adverse tax consequences. These factors may have a material adverse effect on our ability to generate revenue outside of the United States and to deploy resources where they could otherwise be used to their greatest advantage and, consequently, may adversely affect our financial condition and results of operations. Note 13 of the notes to our consolidated financial statements presents revenue and long-lived assets by geographic area.

Competition

The photomask industry is highly competitive and most of our customers utilize multiple photomask suppliers. Our ability to compete depends primarily upon the consistency of our product quality, timeliness of delivery, as well as pricing, technical capability, and service, which we believe are the principal factors considered by customers in selecting their photomask suppliers. An inability to meet these requirements could adversely affect our financial condition, results of operations and cash flows. We also believe that geographic proximity to customers is an important factor in certain markets where cycle time from order to delivery is critical. While some of our competitors have greater financial, technical, sales, marketing or other resources than Photronics, we believe that we are able to compete effectively because of our dedication to customer service, investments in state-of-the-art photomask equipment and facilities, and experienced technical employees.

We estimate that, for the types of photomasks we manufacture (IC and FPD), the size of the total market (captive and merchant) is approximately $4.1 billion. Our competitors include Compugraphics International, Ltd., Dai Nippon Printing Co., Ltd (outside of Taiwan), Hoya Corporation, SK-Electronics Co. Ltd., Taiwan Mask Corporation, Toppan Printing Co., Ltd., Supermask Co. Ltd., and Chengdu NeWay Photomask Making Co., Ltd. We also compete with semiconductor manufacturers' captive photomask manufacturing operations that supply photomasks for internal use and, in some instances, also for external customers and foundries. We expect to face continued competition which, in the past, has led to pressure to reduce prices. We believe the pressure to reduce prices, together with the significant investment required in capital equipment to manufacture high-end photomasks, has contributed to the decrease in the number of independent manufacturers, and we expect such pressure to continue in the future.

Employees

As of October 29, 2017, we had 1,475 employees. We believe we offer competitive compensation and other benefits and that our employee relations are good.

ITEM 1A. RISK FACTORS

Technology failures or cyber security breaches could have a material adverse effect on our operations.

We rely on information technology systems to process, transmit, store, and protect electronic information. For example, a significant portion of the communications between our personnel, customers, and suppliers depends on information technology. Our information technology systems may be vulnerable to a variety of interruptions due to events beyond our control, including, but not limited to, natural disasters, terrorist attacks, telecommunications failures, computer viruses, hackers, and other security issues. We have technology and information security processes and disaster recovery plans in place to mitigate our risks to these vulnerabilities. However, these measures may not be adequate to ensure that our operations will not be disrupted, should such an event occur.

Our dependency on the microelectronics industry, which as a whole is volatile, could have a negative material impact on our business.

We sell substantially all of our photomasks to semiconductor or flat panel display designers, manufacturers and foundries, as well as to other high performance electronics manufacturers. We believe that the demand for photomasks depends primarily on design activity rather than sales volume from products using photomask technologies. Consequently, an increase in semiconductor or FPD sales does not necessarily result in a corresponding increase in photomask sales. In addition, the reduced use of customized ICs, a reduction in design complexity, other changes in the technology or methods of manufacturing or designing semiconductors or FPDs, or a slowdown in the introduction of new semiconductor or FPD designs could reduce demand for photomasks even if the demand for semiconductors and FPDs increases. Historically, the semiconductor industry has been volatile, with sharp periodic downturns and slowdowns. These downturns have been characterized by, among other things, diminished product demand, excess production capacity and accelerated erosion of selling prices.

We may, in the future, incur net losses.

Although we have been profitable since fiscal 2010, we have, in the past, incurred net losses. The net losses experienced in prior years were due, in part, to macroeconomic factors, which resulted in our incurring significant charges for restructurings and impairments of long-lived assets. We cannot provide assurance that we will not incur net losses in the future.

We have a high level of fixed costs; thus we must achieve minimum sales volumes sufficient to cover our fixed costs.

As a consequence of the capital-intensive nature of the photomask manufacturing business, we have a high level of fixed costs and a high degree of operating leverage. Accordingly, should our sales volumes decline as a result of a decrease in design releases from our customers or for any other reason, we may have excess or underutilized production capacity which could significantly impact our operating margins or result in write-offs from asset impairments.

Our quarterly operating results fluctuate significantly and may continue to do so in the future.

We have experienced fluctuations in our quarterly operating results, and we anticipate that such fluctuations will continue and could intensify in the future. Fluctuations in operating results may result in volatility in the prices of our common stock and financial instruments linked to its value. Operating results may fluctuate as a result of many factors, including the size and timing of orders and shipments, the loss of significant customers, changes in product mix, the flow of customer design releases, technological change, fluctuations in manufacturing yields, competition and general economic conditions. We operate in a high fixed-cost environment and, should our revenues and asset utilization decrease, our operating margins could be negatively impacted.

Our customers generally order photomasks on an as-needed basis, and our revenue in any quarter is dependent on orders received during that quarter. Since we operate with little backlog, and the rate of new orders may vary significantly from quarter-to-quarter, our capital expenditures and, to some extent, expense levels are based primarily on sales forecasts and technological advancements in photomask manufacturing equipment. Consequently, if anticipated revenues in any quarter do not occur when expected, capital expenditures could be higher than needed, resulting in underutilized capacity and disproportionately high expense levels, causing operating results to be adversely affected. Due to the foregoing factors, we believe that quarter-to-quarter comparisons of our operating results cannot be relied upon as indicators of future performance. In addition, in future quarters, our operating results could be below guidance we may provide as well as the expectations of public market analysts and investors which, in turn, could have a material adverse effect on the market price of our common stock.

The photomask industry is subject to rapid technological change, and we might fail to remain competitive, which could have a material adverse effect on our business and results of operations.

The photomask industry has been, and is expected to continue to be, characterized by technological change and evolving industry standards. In order to remain competitive, we will be required to continually anticipate, respond to and utilize changing technologies of increasing complexity in both traditional and emerging markets that we serve. In particular, we believe that, as semiconductor geometries continue to become smaller and FPDs become larger or otherwise more advanced, we will be required to manufacture increasingly complex photomasks. Additionally, the demand for photomasks has been, and could in the future be, adversely affected by changes in semiconductor and high-performance electronics fabrication methods that affect the type or quantity of photomasks utilized, such as changes in semiconductor demand that favor field-programmable gate arrays and other semiconductor designs that replace application-specific ICs. Furthermore, evidence of the viability and the corresponding market acceptance of alternative methods of transferring IC designs onto semiconductor wafers could reduce or eliminate the need for photomasks in the production of semiconductors. As of the end of fiscal 2017, one alternative method, direct-write lithography, has not been proven to be a commercially viable alternative to photomasks, as it is considered to be too slow for high volume semiconductor wafer production. However, should direct-write or any other alternative method of transferring IC or FPD designs without the use of photomasks achieve market acceptance, and if we are unable to anticipate, respond to or utilize these or other technological changes, due to resource, technological or other constraints, our business and results of operations could be materially adversely affected.

Our operations will continue to require substantial capital expenditures, for which we may be unable to obtain funding.

The manufacture of photomasks requires us to make substantial investments in high-end manufacturing capability. We expect that we will be required to continue to make substantial capital expenditures to meet the technological demands of our customers and to position us for future growth. Our capital expenditure payments for fiscal 2018 are expected to be approximately $250 million, of which $3 million was included in accounts payable on our October 29, 2017, consolidated balance sheet. We cannot provide assurance that we will be able to obtain the additional capital required to fund our operations on reasonable terms, if at all, or that any such inability will not have a material adverse effect on our business and results of operations.

We have been dependent on sales to a limited number of large customers; the loss of any of these customers or a significant reduction in orders from these customers could have a material adverse effect on our revenues and results of operations.

Historically, we have sold a significant proportion of photomasks to a limited number of IC and FPD manufacturers. During fiscal years 2017, 2016 and 2015 our two largest customers accounted for 32%, 36% and 33%, respectively, of our revenue. Our five largest customers accounted for 43%, 50% and 52% of our revenue in fiscal years 2017, 2016 and 2015 respectively. The loss of a significant customer or a significant reduction or delay in orders from any significant customer, (including reductions or delays due to customer departures from recent buying patterns), or an unfavorable change in competitive conditions in the semiconductor or FPD industries, could have a material adverse effect on our financial performance and business prospects. The consolidation of semiconductor manufacturers or an economic downturn in the semiconductor industry may increase the likelihood of losing a significant customer and could also have an adverse effect on our financial performance and business prospects.

We depend on a limited number of suppliers for equipment and raw materials, and, if those suppliers do not deliver their products to us, we may be unable to fulfill orders from our customers, which could adversely affect our business and results of operations.

We rely on a limited number of photomask equipment manufacturers to develop and supply the equipment we use. These equipment manufacturers currently require lead times of up to twelve months or longer between the order and

the delivery of certain photomask imaging and inspection equipment. The failure of such manufacturers to develop or deliver such equipment on a timely basis could have a material adverse effect on our business and results of operations. In addition, the manufacturing equipment necessary to produce advanced photomasks could become prohibitively expensive, which could similarly affect us.

We use high precision quartz photomask blanks, pellicles, and electronic grade chemicals in our manufacturing processes. There are a limited number of suppliers of these raw materials and we have no long-term contracts with these suppliers. Any delays or quality problems in connection with significant raw materials, particularly photomask blanks, could cause delays in the shipments of photomasks, which could have a material adverse effect on our business and results of operations. The fluctuation of foreign currency exchange rates, with respect to prices of equipment and raw materials used in manufacturing, could also have a material adverse effect on our business and results of operations.

We face risks associated with the use of sophisticated equipment and complex manufacturing processes and technologies. Our inability to effectively utilize such equipment and technologies and perform such processes could have a material adverse effect on our business and results of operations.

Our complex manufacturing processes require the use of expensive and technologically sophisticated equipment and materials, and are continually modified in an effort to improve manufacturing yields and product quality. Minute impurities, defects or other difficulties in the manufacturing process can lower manufacturing yields and make products unmarketable. Moreover, the manufacture of leading-edge photomasks is more complex and time consuming than manufacturing less advanced photomasks, and their fabrication may result in delays in the manufacture of all levels of photomasks. We have, on occasion, experienced manufacturing difficulties and capacity limitations that have delayed our ability to deliver products within the time frames contracted for by our customers. We cannot provide assurance that, under such circumstances, we will not experience these or other manufacturing difficulties, or be subject to increased costs or production capacity constraints in the future, any of which could result in a loss of customers or could otherwise have a material adverse effect on our business and results of operations.

We could be subject to damages based on claims brought against us by our customers or lose customers as a result of the failure of our products to meet certain quality specifications.

Our products provide important performance attributes to our customers' products. If a product fails to perform in a manner consistent with quality specifications, or has a shorter useful life than warranted, a customer could seek replacement of the product or damages for costs incurred as a result of the product failing to perform, particularly if such products are sold under agreements that contain limited performance and life cycle warrantees. Our customers often require us to represent that our products conform to certain product specifications that they provide. Any failure to comply with such specifications could result in claims or legal action. A successful claim or series of claims against us could have a material adverse effect on our financial condition and results of operations and could result in a loss of one or more customers.

Our debt agreements limit our ability to obtain additional financing and may obligate us to repay debt before its maturity.

Financial covenants related to our credit facility, which expires in December 2018, include a Total Leverage Ratio, a Minimum Interest Coverage Ratio, and Minimum Unrestricted Cash Balances. Existing covenant restrictions limit our ability to obtain additional debt financing and, should we be unable to meet one or more of these covenants, our lenders may require us to repay any outstanding balance prior to the expiration date of the agreements. Our ability to comply with the financial and other covenants in our debt agreements may be affected by worsening economic or business conditions, or other events. We cannot assure that, under such circumstances, additional sources of financing would be available to pay off any long-term borrowings, so as to avoid default. Should we default on certain of our long-term borrowings, a cross default would occur on other long-term borrowings, unless amended or waived.

Joint ventures may not operate according to their business plans if our partners fail to fulfill their obligations, which may adversely affect our results of operations and may force us to dedicate additional resources to these joint ventures.

The nature of a joint venture requires us to share control in certain areas with unaffiliated third parties. If our joint venture partners do not fulfill their obligations, the affected joint venture may not be able to operate according to its business plan. In that case, our results of operations may be adversely affected and we may be required to increase the level of our commitment to the joint venture. Also, differences in views among joint venture participants may result in delayed decisions or failures to agree on major issues. If these differences cause the joint ventures to deviate from their business plans, our results of operations could be adversely affected.

We may not be able to consummate future acquisitions or integrate acquisitions into our business, which could result in unanticipated expenses and losses.

As part of our business growth strategy, we have acquired businesses and entered into joint ventures in the past, and we may pursue acquisitions and joint venture opportunities in the future. Our ability to implement this component of our growth strategy will be limited by our ability to identify appropriate acquisition or joint venture candidates and our financial resources, including our available cash and borrowing capacity. The expense incurred in consummating acquisitions or entering into joint ventures, the time it takes to integrate an acquisition, or our failure to integrate businesses successfully, could result in unanticipated expenses and losses. Furthermore, we may not be able to realize any of the anticipated benefits from acquisitions or joint ventures.

The process of integrating acquired operations into our existing operations may result in unforeseen operating difficulties, and may require significant financial resources that would otherwise be available for the ongoing development or expansion of existing operations. Some of the risks associated with the integration of acquisitions include: potential disruption of our ongoing business and distraction of management; unforeseen claims and liabilities, including unexpected environmental exposures; unforeseen adjustments, taxes, charges and write-offs; problems enforcing the indemnification obligations of sellers of businesses or joint venture partners for claims and liabilities; unexpected losses of customers of, or suppliers to, the acquired business; difficulty in conforming the acquired businesses' standards, processes, procedures and controls with our operations; variability in financial information arising from the implementation of purchase price accounting; inability to coordinate new product and process development; loss of senior managers and other critical personnel and problems with new labor unions; and challenges arising from the increased scope, geographic diversity and complexity of our operations.

Our announced expansions into China entail substantial risks.

During the last two years we have announced plans to expand our manufacturing operations into China, see note 19 to the consolidated financial statements for more information on these expansion plans. These investments are subject to substantial risks which may include, but are not limited to: delays in or the inability to obtain necessary permits that are needed to enable us to construct our facilities or conduct our ongoing business; the inability to protect our intellectual property rights under Chinese law, which may not offer as high of a level of protection as U.S. law; unexpectedly long negotiation periods with Chinese suppliers and customers; quality issues related to materials sourced from local vendors; unexpectedly high labor costs due to a tight labor supply; and difficulty in repatriating funds and selling or transferring assets. Our investments in China also expose us to a significant additional foreign currency exchange risk, which we have not been subject to in recent years. These and other risks may result in our not realizing a return on, or losing some, or all, of our planned investments in China, which would have a material adverse effect on our financial condition and financial performance.

Our cash flows from operations and current holdings of cash may not be adequate for our current and long-term needs.

Our liquidity, as we operate in a high fixed cost environment, is highly dependent on our revenue volume and the timing of our capital expenditures, which can vary significantly from period to period. Depending on conditions in the semiconductor and FPD markets, our cash flows from operations and current holdings of cash may not be adequate to meet our current and long-term needs for capital expenditures, operations and debt repayments. Historically, in certain years, we have used external financing to fund these needs. Due to conditions in the credit markets and covenant restrictions on our existing debt, some financing instruments used by us in the past may not be available. Therefore, we cannot provide assurance that additional sources of financing would be available to us on commercially favorable terms, if at all, should our cash requirements exceed our existing cash and cash available under our credit facility.

We may incur unforeseen charges related to possible future facility closures or restructurings.

We cannot provide assurance that there will not be facility closures or restructurings in the near or long-term, nor can we assure that we will not incur significant charges should there be any future facility closures or restructurings.

We operate in a highly competitive environment, and, should we be unable to meet our customers' requirements for product quality, timeliness of delivery or technical capabilities, our revenue could be adversely affected.

The photomask industry is highly competitive, and most of our customers utilize more than one photomask supplier. Our competitors include Compugraphics International, Ltd., DNP (outside of Taiwan), Hoya Corporation, SK-Electronics Co., Ltd., Taiwan Mask Corporation and Toppan Printing Co., Ltd. We also compete with semiconductor manufacturers' captive photomask manufacturing operations, some of which market their photomask manufacturing services to outside customers. We expect to face continued competition from these and other suppliers in the future. Some of our competitors have substantially greater financial, technical, sales, marketing or other resources than us. Also, when producing smaller geometry photomasks, some of our competitors may be able to more rapidly develop, produce, and achieve higher manufacturing yields than us. We believe that consistency of product quality and timeliness of delivery, as well as price, technical capability, and service are the principal factors considered by customers when selecting their photomask suppliers. Our inability to meet these competitive requirements could have a material adverse effect on our business and results of operations. In the past, competition has led to pressure to reduce prices and the need to invest in advanced manufacturing technology, which, we believe, contributed to the decrease in the number of independent photomask suppliers. These pressures may continue in the future.

Our substantial non-US operations are subject to additional risks.

Revenues from our non-U.S. operations were approximately 77%, 76% and 75% of our total revenues in fiscal years 2017, 2016 and 2015, respectively. We believe that maintaining significant international operations requires us to have, among other things, a local presence in the geographic markets that we supply. This requires significant investments in financial, managerial, operational, and other resources. Since 1996, we have significantly expanded our operations in international markets by acquiring existing businesses in Europe, acquiring majority equity interests in photomask manufacturing operations in Korea and Taiwan and building a manufacturing facility for FPD photomasks in Taiwan. Additionally, since 2016, we have announced plans to expand our manufacturing operations into China, see Note 19 to the consolidated financial statements for more information on these expansion plans. In order to enable us to optimize our investments and other resources, we closely monitor the semiconductor and FPD manufacturing markets for indications of geographic movement and, in conjunction with these efforts, continue to assess the locations of our manufacturing facilities. These assessments may result in the opening or closing of facilities.

Operations outside of the United States are subject to inherent risks, including fluctuations in exchange rates, unstable political and economic conditions in various countries, changes in economic alliances, unexpected changes in regulatory requirements, compliance with a variety of foreign laws and regulations may be burdensome, compliance with anti-bribery and anti-corruption laws (such as the Foreign Corrupt Practices Act) as well as anti-money-laundering laws may be costly, tariffs and other trade barriers, difficulties in staffing and managing international operations, longer accounts receivable payment cycles, foreign countries may adopt other restrictions on foreign trade or investment, including currency exchange controls, trade sanctions could result in losing access to customers and suppliers in those countries, agreements may be difficult to enforce and receivables difficult to collect and potentially adverse tax consequences. These factors may have a material adverse effect on our ability to generate revenues outside of the United States and, consequently, on our business and results of operations.

Changes in foreign currency exchange rates could have a material adverse effect on our results of operations, financial condition or cash flows.

Our consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP) and are reported in U.S. dollars. Our operations have transactions and balances denominated in currencies other than the U.S. dollar, primarily the Korean won, New Taiwan dollar, Japanese yen, euro, Singapore dollar, and the pound sterling. As a result of commencing construction of two new facilities in China, we now also have transactions and balances denominated in the Chinese renminbi. In fiscal year

2017, we recorded a net loss from changes in foreign currency exchange rates of $5.2 million in our statement of income, while our net assets were increased by $19.7 million as a result of the translation of foreign currency financial statements to U.S. dollars. Significant foreign currency fluctuations may adversely affect our results of operations, financial condition or cash flows.

Our business depends on managerial and technical personnel, who are in great demand, and our inability to attract and retain qualified employees could adversely affect our business and results of operations.

Our success depends, in part, upon key managerial and technical personnel, as well as our ability to continue to attract and retain additional qualified personnel. The loss of certain key personnel could have a material adverse effect on our business and results of operations. There can be no assurance that we can retain our key managerial, and technical employees, or that we can attract similar additional employees in the future.

We may be unable to enforce or defend our ownership and use of proprietary technology, and the utilization of unprotected company developed technology by our competitors could adversely affect our business, results of operations and financial position.

We believe that the success of our business depends more on proprietary technology, information and processes, and know-how than on our patents or trademarks. Much of our proprietary information and technology related to manufacturing processes is not patented and may not be patentable. We cannot offer assurance that:

·we will be able to adequately protect our technology;

·competitors will not independently develop similar technology; or

·international intellectual property laws will adequately protect our intellectual property rights.

We may become the subject of infringement claims or legal proceedings by third parties with respect to current or future products or processes. Any such claims, with or without merit, or litigation to enforce or protect our intellectual property rights that require us to defend against claimed infringements of the rights of others, could result in substantial costs, diversion of resources, and product shipment delays or could force us to enter into royalty or license agreements, rather than dispute the merits of these claims. Any of the foregoing could have a material adverse effect on our business, results of operations and financial position.

We may be unprepared for changes to environmental laws and regulations and may incur liabilities arising from environmental matters.

We are subject to numerous environmental laws and regulations that impose various environmental controls on, among other things, the discharge of pollutants into the air and water and the handling, use, storage, disposal and clean-up of solid and hazardous wastes. Changes in these laws and regulations may have a material adverse effect on our financial position and results of operations, and inadequate compliance with their requirements could give rise to significant liabilities.

If we violate environmental, health and safety laws or regulations, in addition to being required to correct such violations, we can be held liable in administrative, civil or criminal proceedings, and substantial fines and other sanctions could be imposed that could disrupt or limit our operations. Liabilities associated with the investigation and cleanup of hazardous substances, as well as personal injury, property damages or natural resource damages arising from the release of, or exposure to, such hazardous substances, may be imposed in many situations without regard to violations of laws or regulations or other fault, and may also be imposed jointly and severally (so that a responsible party may be held liable for more than its share of the losses involved, or even the entire loss). Such liabilities may also be imposed on many different entities with a relationship to the hazardous substances at issue, including, for example, entities that formerly owned or operated the property affected by the hazardous substances and entities that arranged for the disposal of the hazardous substances at the affected property, as well as entities that currently own or operate such property. The nature of our business, including historical operations at our current and former facilities, exposes us to risks of liability under these laws and regulations due to the production, storage, use, transportation and sale of materials that can cause contamination or personal injury if released into the environment. Additional information may arise in the future concerning the nature or extent of our liability with respect to identified sites and additional sites that may be identified for which we are alleged to be liable.

Our production facilities could be damaged or disrupted by natural disasters or labor strikes, either of which could adversely affect our financial position, results of operations and cash flows.

A major catastrophe, such as an earthquake or other natural disaster, labor strike, or work stoppage at any of our manufacturing facilities, or a manufacturing facility of our suppliers or customers, could result in a prolonged

interruption of our business. A disruption resulting from any one of these events could cause significant delays in shipments of our products and the loss of revenue and customers, which could have a material adverse effect on our financial position, results of operations, and cash flows. Our facilities in Taiwan are located in a seismically active area.

Our sales can be impacted by the health and stability of the general economy, which could adversely affect our results of operations and cash flows.

Unfavorable general economic conditions in the U.S. or other countries in which we or our customers conduct business may have the effect of reducing the demand for photomasks. Economic downturns may lead to a decrease in demand for end products whose manufacturing processes involve the use of photomasks, which may result in a reduction in new product design and development by semiconductor or FPD manufacturers and adversely affect our results of operations and cash flows.

Additional taxes could adversely affect our financial results.

Our tax filings are subject to audits by tax authorities in the various jurisdictions in which we do business. These audits may result in assessments of additional taxes that are subsequently resolved with the taxing authorities or through the courts. Currently, we believe there are no outstanding assessments whose resolution would result in a material adverse financial result. However, we cannot offer assurances that unasserted or potential future assessments would not have a material adverse effect on our financial condition or results of operations.

Our financial results may be adversely impacted by proposed legislative tax reform.

Various U.S. corporate tax reform bills and other proposals have been, or are currently, under consideration by Congress and the Executive branch. These proposals include, among other items, corporate income tax rate changes in varying, uncertain or unspecified amounts; the modification or elimination of certain tax incentives and changes to the existing rules and regulations for taxing overseas earnings (including possible modifications to the current rules and regulations for repatriating such earnings); and measures to prevent base erosion and profit splitting (“BEPS”). It is not clear whether these proposals, if enacted, would materially affect the taxation of our domestic and foreign earnings.

In addition to the U.S. tax proposals, corporate tax reform proposals are under consideration in Taiwan and Korea including, among other items, corporate income tax rate changes, the modification or elimination of certain tax incentives, changes in unremitted earnings tax rates and modification of the related rules, and measures to prevent BEPS. Enactment of such changes could materially affect the tax treatment of our foreign subsidiaries’ earnings and their statutory deferred tax assets and liabilities.

Our business could be adversely impacted by global or regional catastrophic events.

Our business could be adversely affected by terrorist acts, major natural disasters, widespread outbreaks of infectious diseases, or the outbreak or escalation of wars, especially in the Asian markets, where we generate a significant portion of our sales, and in Japan where we purchase raw materials and capital equipment. Such events in the geographic regions in which we do business, including escalations of political tensions and military operations within the Korean Peninsula, where a significant portion of our foreign operations are located, could have material adverse impacts on our revenue, cost and availability of raw materials, results of operations, cash flows and financial condition.

Servicing our debt requires a significant amount of cash, and we may not generate sufficient cash flows from our operations to pay our indebtedness.

Our ability to make scheduled payments of debt principal and interest, or to refinance our indebtedness, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not continue to generate sufficient cash flows from operations to both service our debt and make necessary capital expenditures. If we are unable to generate such cash flows, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness would depend upon the conditions in the capital

markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

Our hedging activity could negatively impact our results of operations and cash flows.

We may enter into derivatives to manage our exposure to interest rate and currency movements. If we do not accurately forecast our results of operations, execute contracts that do not effectively mitigate our economic exposure to interest rates and currency rates, elect to not apply hedge accounting, or fail to comply with the complex accounting requirements for hedging, our results of operations and cash flows could be volatile, as well as negatively impacted.

The market price of the Company’s common stock is subject to volatility and could fluctuate widely in price in response to various factors, many of which are beyond our control.

Factors that may influence the price of the common stock include, without limitation, the following:

·loss of any of our key customers or suppliers;

·additions or departures of key personnel;

·sales of common stock;

·our ability to execute our business plan, including but not limited to, our plans to expand into China;

·announcements and consummations of business acquisitions;

·operating results that fall below expectations;

·additional issuances of common stock;

·intellectual property disputes;

·industry developments;

·news or disclosures by competitors;

·business combinations, divestitures or bankruptcies by customers, suppliers or competitors;

·economic and other external factors; and

·period-to-period fluctuations in our financial results.

In addition, the securities markets have from time to time experienced significant price and volume fluctuations that are unrelated to the operating performance of particular companies. These market fluctuations may also materially and adversely affect the market price of the Company's common stock. One should also be aware that price volatility might be worse if the trading volume of shares of the common stock is low.

Ineffective internal controls could impact the Company's business and operating results.

The Company's internal control over financial reporting may not prevent or detect misstatements because of its inherent limitations, including the possibility of human error, the circumvention or overriding of controls, or fraud. Even effective internal controls can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. If the Company fails to maintain the adequacy of its internal controls, including any failure to implement required new or improved controls, or if the Company experiences difficulties in their implementation, the Company's business and operating results could be harmed, and the Company could fail to meet its financial reporting obligations.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

The following table presents certain information about the Company's photomask manufacturing facilities:

Location	Type of Interest	
Allen, Texas	Owned	
Boise, Idaho	Owned	
Brookfield, Connecticut	Owned	
Bridgend, Wales	Leased	
Cheonan, Korea	Owned	
Dresden, Germany	Leased	
Hsinchu, Taiwan	Owned	(1)
Hsinchu, Taiwan	Leased	
Taichung, Taiwan	Owned	(1)

(1) The Company owns its manufacturing facility in Taichung and one of its manufacturing facilities in Hsinchu. However, it leases the related land.

We have announced plans to expand into China and construct two manufacturing facilities. Production at both of these facilities is expected to commence in early 2019.

ITEM 3. LEGAL PROCEEDINGS

We are subject to various claims that arise in the ordinary course of business. We believe such claims, individually or in the aggregate, will not have a material adverse effect on our business.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES

The Common Stock of the Company is traded on the NASDAQ Global Select Market ("NASDAQ") under the symbol PLAB. The table below shows the range of high and low sale prices per share in each quarter for fiscal years 2017 and 2016, as reported by the NASDAQ Global Select Market.

	High	Low
Fiscal Year Ended October 29, 2017:		
Quarter Ended January 29, 2017	$12.10	$8.20
Quarter Ended April 30, 2017	11.80	10.30
Quarter Ended July 30, 2017	11.63	8.80
Quarter Ended October 29, 2017	10.10	7.55
Fiscal Year Ended October 30, 2016:		
Quarter Ended January 31, 2016	$13.05	$9.57
Quarter Ended May 1, 2016	12.39	9.30
Quarter Ended July 31, 2016	10.69	8.56
Quarter Ended October 30, 2016	10.90	8.81

On December 15, 2017, the closing sale price of our Common Stock, per the NASDAQ Global Select Market, was $8.70. Based on available information, we estimate that we have approximately 11,285 shareholders.

To date, we have not paid any cash dividends on PLAB shares and, for the foreseeable future, we anticipate that earnings will continue to be retained for use in our business. Further, our credit facility precludes us from paying cash dividends.

Securities authorized for issuance under equity compensation plans

The information regarding our equity compensation required to be disclosed by Item 201(d) of Regulation S-K is incorporated by reference from the Photronics, Inc. 2018 definitive Proxy Statement in Item 12 of Part III of this report. The 2018 Proxy Statement will be filed within 120 days after our fiscal year ended October 29, 2017.

ITEM 6. SELECTED FINANCIAL DATA

The following selected financial data (in thousands, except per share amounts) is derived from our audited consolidated financial statements. The data should be read in conjunction with the audited consolidated financial statements and notes thereto, and other financial information included elsewhere in this Annual Report on Form 10-K.

	Year Ended				
	October 29, 2017	October 30, 2016	November 1, 2015	November 2, 2014	November 3, 2013
OPERATING DATA:					
Revenue	$450,678	$483,456	$524,206	$455,527	$422,180
Cost of goods sold	(359,363)	(364,750)	(381,070)	(355,181)	(322,540)
Gross profit	91,315	118,706	143,136	100,346	99,640
Selling, general and administrative	(43,585)	(44,577)	(48,983)	(49,638)(d)	(48,213)(f)
Research and development	(15,862)	(21,654)	(21,920)	(21,913)	(20,758)
Operating income	31,868	52,475	72,233	28,795	30,669
Other income (expense):					
Interest and other income (expense), net	(3,068)	2,424	2,797 (c)	3,410	3,892
Interest expense	(2,235)	(3,365)	(4,990)	(7,247)	(7,756)
Gains on sales of investments	-	8,940 (a)	-	-	-
Gain on acquisition	-	-	-	16,372 (e)	-
Income before income tax provision	26,565	60,474	70,040	41,330	26,805
Income tax provision	(5,276)	(4,798)(b)	(13,181)	(9,295)	(7,229)
Net income	21,289	55,676	56,859 (c)	32,035 (d)(e)	19,576 (f)
Net income attributable to noncontrolling interests	(8,159)	(9,476)	(12,234)	(6,039)	(1,610)
Net income attributable to Photronics, Inc. shareholders	$13,130	$46,200 (a)(b)	$44,625 (c)	$25,996 (d)(e)	$17,966 (f)
Earnings per share:					
Basic	$0.19	$0.68 (a)(b)	$0.67 (c)	$0.42 (d)(e)	$0.30 (f)
Diluted	$0.19	$0.64 (a)(b)	$0.63 (c)	$0.41 (d)(e)	$0.29 (f)
Weighted-average number of common shares outstanding:					
Basic	68,436	67,539	66,331	61,779	60,644
Diluted	69,288	76,354	78,383	66,679	61,599

BALANCE SHEET DATA

	As of October 29, 2017	October 30, 2016	November 1, 2015	November 2, 2014	November 3, 2013
Working capital	$367,348	$ 360,269	$ 168,237	$ 190,152	$ 212,837
Property, plant and equipment, net	535,197	506,434	547,284	550,069	422,740
Total assets	1,020,794	987,988	1,042,811	1,025,564	883,040
Total borrowings	61,976	67,288	132,219	141,011	191,596
Total Photronics, Inc. shareholders' equity	744,564	710,363	646,555	628,050	585,314

	FY 2016	FY 2015	FY 2014	FY 2013
Working Capital (g):				
Previously reported	$360,269	$168,068	$190,152	$212,797
ASU 2015-03 adjustment	-	169	-	40
Retrospectively adjusted	$360,269	$168,237	$190,152	$212,837
Total Assets (g):				
Previously reported	$988,267	$1,043,376	$1,026,739	$885,505
ASU 2015-03 adjustment	(279)	(565)	(1,175)	(2,465)
Retrospectively adjusted	$987,988	$1,042,811	$1,025,564	$883,040
Total borrowings (g):				
Previously reported	$67,567	$132,615	$142,186	$194,021
ASU 2015-03 adjustment	(279)	(396)	(1,175)	(2,425)
Retrospectively adjusted	$67,288	$132,219	$141,011	$191,596

(a) Includes $8.8 million gain on sale of investment in a foreign entity and $0.2 million gain on the sale of the Company's 49.99% interest in the MP Mask joint venture

(b) Includes tax benefits in Taiwan of $4.8 million primarily related to the recognition of prior period tax benefits and other tax positions no longer deemed necessary.

(c) Includes $0.9 million of financing expenses related to the exchange of $57.5 million of 3.25% convertible senior notes.

(d) Includes $2.5 million, net of tax, of expenses related to the acquisition of DPTT.

(e) Includes non-cash gain of $16.4 million, net of tax, on acquisition of DPTT.

(f) Includes $0.8 million, net of tax, of expenses related to the acquisition of DPTT.

(g) Balances reflect the impact of the adoption of a new accounting standard in fiscal year 2016 (ASU 2015-03) related to the balance sheet classification of debt issuance costs. See Note 6 to the consolidated financial statements for additional information.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Results of Operations for the Years Ended October 29, 2017, October 30, 2016 and November 1, 2015

Overview

We sell substantially all of our photomasks to semiconductor designers and manufacturers, and manufacturers of FPDs. Photomask technology is also being applied to the fabrication of other higher performance electronic products such as photonics, micro-electronic mechanical systems and certain nanotechnology applications. Our selling cycle is tightly interwoven with the development and release of new semiconductor designs and flat panel display applications, particularly as they relate to the semiconductor industry's migration to more advanced product innovation, design methodologies and fabrication processes. We believe that the demand for photomasks primarily depends on design activity rather than sales volumes from products manufactured using photomask technologies. Consequently, an increase in semiconductor or FPD sales does not necessarily result in a corresponding increase in photomask sales. However, the reduced use of customized ICs, reductions in design complexity, other changes in the technology or methods of manufacturing or designing semiconductors, or a slowdown in the introduction of new semiconductor or FPD designs could reduce demand for photomasks even if the demand for semiconductors and FPDs increases. Advances in semiconductor, FPD and photomask design and semiconductor and FPD production methods that shift the burden of achieving device performance away from lithography could also reduce the demand for photomasks. Historically, the microelectronic industry has been volatile, experiencing periodic downturns and slowdowns in design activity. These downturns have been characterized by, among other things, diminished product demand, excess production capacity and accelerated erosion of selling prices.

We are typically required to fulfill customer orders within a short period of time, sometimes within 24 hours. This results in our having a minimal level of backlog orders, typically one to two weeks of backlog for IC photomasks and two to three weeks of backlog for FPD photomasks.

The global semiconductor industry is driven by end markets which have been closely tied to consumer driven applications of high performance semiconductor devices, including, but not limited to, mobile display devices, mobile communications, and computing solutions. While we cannot predict the timing of the industry's transition to volume production of next-generation technology nodes, or the timing of up and down cycles with precise accuracy, we believe that such transitions and cycles will continue into the future, beneficially and adversely affecting our business, financial condition and operating results as they occur. We believe our ability to remain successful in these environments is dependent upon the achievement of our goals of being a service and technology leader and efficient solutions supplier, which we believe should enable us to continually reinvest in our global infrastructure.

We are focused on improving our competitiveness by advancing our technology and reducing costs and, in connection therewith, have invested and plan to continue to invest in manufacturing equipment to serve the high-end markets. As we face challenges in the current and near term that require us to make significant improvements in our competitiveness, we continue to evaluate further cost reduction initiatives.

As of December 2017, state-of-the-art production for semiconductor masks is considered to be 45 nanometer and lower for ICs and Generation 8 and above and AMOLED display-based process technologies for FPDs. However, 65 nanometer and above geometries for semiconductors and Generation 7 and below, excluding AMOLED, process technologies for FPDs constitute the majority of designs currently being fabricated in volume. At these geometries, we can produce full lines of photomasks, and there is no significant technology employed by our competitors that is not available to us. We expect 45 nanometer and below designs to continue to move to wafer fabrication throughout fiscal 2018, and we believe we are well positioned to service an increasing volume of this business as a result of our investments in manufacturing processes and technology in the regions where our customers are located.

The photomask industry has been, and is expected to continue to be, characterized by technological change and evolving industry standards. In order to remain competitive, we will be required to continually anticipate, respond to, and utilize changing technologies. In particular, we believe that, as semiconductor geometries continue to become smaller, and FPD designs become larger or otherwise more advanced, we will be required to manufacture even more complex optically-enhanced reticles, including optical proximity correction and phase-shift photomasks. Additionally, demand for photomasks has been, and could in the future be, adversely affected by changes in semiconductor and high performance electronics fabrication methods that affect the type or quantity of photomasks used, such as changes in semiconductor demand that favor field-programmable gate arrays and other semiconductor designs that replace application-specific ICs, or the use of certain chip stacking methodologies that lessen the emphasis on conventional lithography technology. Furthermore, increased market acceptance of alternative methods of transferring circuit designs onto semiconductor wafers could reduce or eliminate the need for photomasks in the production of semiconductors. As of the end of fiscal year 2017, one alternative method, direct-write lithography, has not been proven to be a commercially viable alternative to photomasks, as it is considered to be too slow for high volume semiconductor wafer production, and we have not experienced a significant loss of revenue as a result of this or other alternative semiconductor design methodologies. However, should direct-write or any other alternative method of transferring IC designs to semiconductor wafers without the use of photomasks achieve market acceptance, and we do not anticipate, respond to, or utilize these or other changing technologies due to resource, technological or other constraints, our business and results of operations could be materially adversely affected.

Both our revenues and costs have been affected by the increased demand for high-end technology photomasks that require more advanced manufacturing capabilities, but generally command higher average selling prices ("ASPs"). Our capital expenditure payments aggregated approximately $246 million for the three fiscal years ended October 29, 2017, which has significantly contributed to our cost of goods sold. We intend to continue to make the required investments to support the technological demands of our customers that we believe will position us for future growth. In support of this effort, we expect capital expenditure payments to be approximately $250 million in fiscal year 2018.

The manufacture of photomasks for use in fabricating ICs, FPDs, and other related products built using comparable photomask-based process technologies has been, and continues to be, capital intensive. Our employees and our integrated global manufacturing network, which currently consists of nine manufacturing sites, represent a significant portion of our fixed operating cost base. Should our revenue decrease as a result of a decrease in design releases from our customers, we may have excess or underutilized production capacity, which could significantly impact our operating margins, or result in write-offs from asset impairments.

In the fourth quarter of fiscal 2017, we announced that Photronics UK, Ltd., a wholly owned subsidiary of ours, signed an investment agreement with Hefei State Hi-tech Industry Development Zone to establish a manufacturing facility in Hefei, China. Under the terms of the agreement, through our subsidiary, we will invest a minimum of $160 million, a portion of which may be funded with local borrowings, to build and operate a research and development and manufacturing facility for high-end and mainstream FPD photomasks. Hefei State Hi-tech Industry Development Zone will provide certain investment incentives and support for this facility, which will have initial capability to produce up to G10.5+ large area masks and AMOLED products. Construction began in late 2017 and production is anticipated to commence in early 2019.

In August 2016, Photronics Singapore Pte, Ltd., a wholly owned subsidiary, signed an investment agreement with the Administrative Committee of Xiamen Torch Hi-Tech Industrial Development Zone (Xiamen Torch) to establish an IC manufacturing facility in Xiamen, China. Under the terms of the agreement, we will build and operate an IC facility to engage in research and development, manufacture and sale of photomasks, in return for which Xiamen Torch will provide certain investment incentives and support. This expansion is also substantially supported by customer commitments for its output. The total investment per the agreement is $160 million to be funded over the next five years in cash, transferred equipment and potential local borrowings. Construction began in 2017 and production is anticipated to start in early 2019.

In the third quarter of fiscal 2017, we agreed to create a joint venture with DNP to encompass the Xiamen project. Under the agreement, our wholly-owned Singapore subsidiary will own 50.01% of the joint venture, which will be named Photronics DNP Mask Corporation Xiamen (PDMCX), and a subsidiary of DNP will own the remaining 49.99%. The financial results of the joint venture will be included in Photronics' consolidated financial statements.

In the third quarter of fiscal 2017, our majority owned IC facility in Taiwan paid a dividend of $8.3 million to its noncontrolling interests.

In the third quarter of fiscal 2016, our majority owned IC facility in Taiwan paid a dividend of $11.9 million to its noncontrolling interests.

In the third quarter of fiscal 2016, we sold our investment in MP Mask to Micron for $93.1 million and recorded a gain of $0.1 million on the sale. On that same date a supply agreement commenced between Photronics and Micron, which provided that we would be the majority outsourced supplier of Micron's photomasks and related services. The supply agreement had a one year term and expired in May 2017. We have unlimited rights to use the technology under our prior technology license agreement.

In the second quarter of fiscal 2016, $57.5 million of our senior convertible notes matured. We repaid $50.1 million to noteholders, and issued approximately 0.7 million shares to noteholders that elected to convert their notes to common

stock. The notes were exchanged at the rate of approximately 96 shares per $1,000 note principle, equivalent to a conversion rate of $10.37 per share.

In the first quarter of fiscal 2015 we privately exchanged $57.5 million in aggregate principal amount of our 3.25% convertible senior notes with a maturity date of April 1, 2016, for new 3.25% convertible senior notes with an aggregate principal amount of $57.5 million with a maturity date of April 1, 2019. The conversion rate of the new notes is the same as that of the exchanged notes, which were issued in March 2011 with a conversion rate of approximately 96 shares of common stock per $1,000 note principal, equivalent to a conversion price of $10.37 per share of common stock, and is subject to adjustment upon the occurrence of certain events which are described in the indenture dated January 22, 2015. Note holders may convert each $1,000 principal amount of notes at any time prior to the close of business on the second scheduled trading day immediately preceding April 1, 2019, and we are not required to redeem the notes prior to their maturity date. Interest on the notes accrues in arrears, and is paid semiannually through the notes' maturity date.

Results of Operations

The following table presents selected operating information expressed as a percentage of revenue:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Revenue	100.0%	100.0 %	100.0 %
Cost of goods sold	(79.7)	(75.4)	(72.7)
Gross profit	20.3	24.6	27.3
Selling, general and administrative expenses	(9.7)	(9.2)	(9.3)
Research and development expenses	(3.5)	(4.5)	(4.2)
Operating income	7.1	10.9	13.8
Interest income and other income (expense)	(0.7)	0.5	0.5
Interest expense	(0.5)	(0.7)	(1.0)
Gains on sales of investments	-	1.8	-
Income before income tax provision	5.9	12.5	13.3
Income tax provision	(1.2)	(1.0)	(2.5)
Net income	4.7	11.5	10.8
Net income attributable to noncontrolling interests	(1.8)	(1.9)	(2.3)
Net income attributable to Photronics, Inc. shareholders	2.9 %	9.6 %	8.5 %

Note: All the following tabular comparisons, unless otherwise indicated, are for the fiscal years ended October 29, 2017 (2017), October 30, 2016 (2016) and November 1, 2015 (2015), in millions of dollars.

Revenue

	2017	2016	2015	Percent Change 2016 to 2017	Percent Change 2015 to 2016
IC	$350.3	$364.6	$420.8	(3.9)%	(13.4)%
FPD	100.4	118.9	103.4	(15.6)%	15.0
Total revenue	$450.7	$483.5	$524.2	(6.8)%	(7.8)%

Revenue decreased 6.8% in 2017 to $450.7 million from $483.5 million in 2016. IC photomask revenue decreased $14.3 million, or 3.9%, as a result of decreased volume of both high-end (4.8%) and mainstream (3.4%) products. Revenue from high-end IC products decreased $23.9 million, or 18.3%, from $130.4 million last year to $106.5 million, primarily as a result of decreased ASPs, while revenue from mainstream IC products increased $9.7 million, or 4.1%, from $234.1 million to $243.8 million which resulted from increased ASPs. FPD sales decreased in 2017 by $18.5 million, or 15.6% from 2016. Revenue from high-end FPD sales fell $18.7 million, or 21.6%, year-over-year, the causes of which were $11.8 million and $6.9 million from decreased ASPs and volume, respectively. FPD mainstream photomask revenue was $32.5 million, essentially flat year-over-year, with a modest increase in volume offsetting a slightly lower decrease in ASPs. High-end photomask applications include mask sets for 45 nanometer and below for IC products, and G8 and above and active matrix organic light-emitting diode (AMOLED) display screen technologies for FPD products. High-end photomasks typically have higher ASPs than mainstream products.

We believe our revenue will increase in 2018, as we expect revenues to increase for both high-end IC and FPD products. Our projected increase in high-end IC revenue is based on our expectation that our largest IC customer will increase its market share at the 28 nanometer node. In addition, we are anticipating growth at the 22 and 14 nanometer node levels. We are expecting increased demand for AMOLED products to lead to revenue growth in 2018, and plan to support this growth, in part, with a new high-end mask writing tool, which is due for delivery to us in the first half of 2018. Beyond 2018, we are anticipating our IC and FPD facilities under construction in China and expected to commence production in the spring of 2019 to fuel growth.

Net revenue decreased 7.8% in 2016, compared with 2015. IC photomask revenue was down primarily as a result of a decline in customer new product launches that require logic masks, as well as some reduction in foundry demand for memory masks. Revenue from high-end IC products decreased $36.5 million from last year to $130.4 million. FPD revenue increased from 2015 primarily due to increased demand for high-end large area masks. Revenue from high-end FPD Masks increased by $15.7 million to $86.6 million in 2016. High-end photomasks typically have higher ASPs than mainstream photomasks.

The following table presents changes in revenue from fiscal years 2016 to 2017 and 2015 to 2016 by geographic area:

	2016 to 2017 Revenue in 2017	Increase (Decrease)	Percent Change	2015 to 2016 Revenue in 2016	Increase (Decrease)	Percent Change
Taiwan	$187.8	$ (5.4)	(2.8)%	$193.2	$ (11.9)	(5.8)%
Korea	122.2	(18.8)	(13.4)%	141.0	(6.9)	(4.7)%
United States	102.0	(11.7)	(10.2)%	113.7	(19.1)	(14.4)%
Europe	36.1	2.7	8.1 %	33.4	(2.4)	(6.7)%
All other Asia	2.6	0.4	18.7 %	2.2	(0.4)	15.3 %
	$450.7	$ (32.8)	(6.8)%	$483.5	$ (40.7)	(7.8)%

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Gross Profit

	2017	2016	2015	Percent Change 2016 to 2017	Percent Change 2015 to 2016
Gross profit	$91.3	$118.7	$143.1	(23.1)%	(17.1)%
Gross margin	20.3%	24.6%	27.3%		

Gross profit and gross margin decreased in 2017, compared with 2016, primarily due to a decrease in overall revenue that resulted from lower ASPs and, to a lesser extent, a reduction in units sold. Gross profit and gross margin decreased in 2016, compared with 2015, primarily as a result of decreased revenue of high-end IC and, to a lesser extent, mainstream IC photomasks. The Company operates in a high fixed-cost environment and, to the extent that the Company's revenues and utilization increase or decrease, gross margin will generally be positively or negatively impacted.

Selling, General and Administrative Expenses

	2017	2016	2015	Percent Change 2016 to 2017	Percent Change 2015 to 2016
Selling, general and administrative expenses	$43.6	$44.6	$49.0	(2.2)%	(9.0)%
Percentage of net sales	9.7%	9.2%	9.3%		

Selling, general and administrative expenses decreased by $1.0 million in 2017, compared with 2016, primarily due to reduced bad debt expense and professional fees, which were partially offset by increased compensation costs and selling expenses. Selling, general and administrative expenses decreased $4.4 million in 2016, compared with 2015, primarily due to reduced compensation, freight, and other expenses.

Research and Development

	2017	2016	2015	Percent Change 2016 to 2017	Percent Change 2015 to 2016
Research & Development expense	$15.9	$21.7	$21.9	(26.7)%	(1.2)%
Percentage of net sales	3.5%	4.5%	4.2%		

Research and development expenses primarily consist of development efforts related to high-end process technologies for 10nm and below IC nodes, FPD G8 and above, and AMOLED applications. Research and development expenses decreased by $5.8 million in 2017 to $15.9 million, from $21.7 million in 2016 as a result of lower customer qualification costs for high-end reticles in both Asia and the U.S. Research and development expenses did not change significantly from 2015 to 2016.

Other Income (Expense), net

	2017	2016	2015
Interest income and other income (expense)	$(3.1)	$2.4	$2.8
Interest expense	(2.2)	(3.3)	(5.0)
Gains on sales of investments	-	8.9	-
Total other income (expense), net	$(5.3)	$8.0	$(2.2)

Interest income and other income (expense) decreased by $5.5 million in 2017, compared with 2016, primarily as a result of increased foreign currency transaction losses in 2017. Interest expense decreased in 2017 compared with 2016 primarily as a result of the maturity of our 3.25% convertible senior notes in April 2016, and lower average outstanding debt balance on our other debt obligations.

Interest expense decreased in 2016 compared with 2015 primarily as a result of the maturity of our 3.25% convertible senior notes in April 2016. Interest income and other income (expense) decreased in 2016, compared with 2015, primarily as a result of unfavorable foreign currency results in 2016, compared to favorable results in 2015. The negative impact of the change in foreign currency results was somewhat mitigated by the favorable settlement of a liability related to our 2014 DPTT acquisition, as well as the favorable effect of not incurring financing fees (which were related to the exchange of senior convertible notes) in 2016 that we had incurred in 2015.

In January 2016, we sold a minority interest investment in a foreign entity and recognized a gain of $8.8 million. In May 2016, we sold our 49.99% interest in the MP Mask joint venture and recognized a gain of $0.1 million.

Income Tax Provision

	2017	2016	2015
Income tax provision	$5.3	$4.8	$13.2
Effective income tax rate	19.9%	7.9%	18.8%

The effective tax rate differs from the U.S. statutory rate of 35% in fiscal years 2017, 2016 and 2015 primarily due to earnings being taxed at lower statutory rates in foreign jurisdictions, the benefit of various investment credits claimed in a foreign jurisdiction, and valuation allowances in jurisdictions with historical and continuing losses.

The increase in effective income tax rate in 2017 compared with 2016 was primarily due to recognition of $1.0 million of previously unrecognized tax benefits, the result of audit settlements and expirations of assessment period statutes of limitations. Those effects were partially offset by 2016 benefit factors, including: the recognition of $2.5 million of previously unrecognized deferred tax assets, the result of improved performance of our FPD operations; the reversal of previously recognized tax expense of $2.4 million that was eliminated by a distribution of the earnings of a foreign subsidiary to its foreign parent; a higher percentage of income before income taxes, including an $8.8 million gain on the sale of an investment in the first quarter of fiscal year 2016, generated in jurisdictions where we previously incurred losses that, due to valuation allowances, did not result in recognition of expense.

The effective income tax rate decreased in 2016 compared with 2015 as a result of the following major factors: recognition in 2016 of $4.3 million, compared with $1.5 million in 2015, of previously unrecognized deferred tax assets, which primarily resulted from the improved performance of our FPD operations; the reversal of previously recognized tax expense of $2.4 million that was eliminated by a distribution of the 2015 earnings of a foreign subsidiary to its foreign parent; and a higher percentage of income before income taxes, including an $8.8 million gain on the sale of an investment in 2016, generated in jurisdictions where the Company previously incurred losses that, due to valuation allowances, did not result in recognition of tax expense.

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We consider all available evidence when evaluating the potential future realization of deferred tax assets, and when, based on the weight of all available evidence, we determine that it is more likely than not that some portion or all of our deferred tax assets will not be realized, we reduce our deferred tax assets by a valuation allowance. We also regularly assess the potential outcomes of ongoing and future tax examinations and, accordingly, have recorded accruals for such contingencies. Included in the balance of unrecognized tax benefits as of October 29, 2017, October 30, 2016 and November 1, 2015, are $3.4 million, $4.6 million and $4.1 million recorded in other liabilities in the consolidated balance sheets that, if recognized, would impact the effective tax rate.

Net Income Attributable to Noncontrolling Interests

Net income attributable to noncontrolling interests decreased $1.3 million to $8.2 million in 2017 compared with $9.5 million in 2016 due to decreased net income at our IC manufacturing facility in Taiwan, and decreased $2.7 million to $9.5 million in 2016 compared with $12.2 million in 2015 as a result of decreased net income at that same facility.

Liquidity and Capital Resources

	October 29, 2017 (in $ millions)	October 30, 2016 (in $ millions)	November 1, 2015 (in $ millions)
Cash and cash equivalents	308.0	314.1	205.9
Net cash provided by operating activities	96.8	122.1	133.2
Net cash (used in) provided by investing activities	(98.1)	52.3	(104.3)
Net cash used in financing activities	(10.9)	(67.0)	(7.1)

As of October 29, 2017, we had cash and cash equivalents of $308.0 million compared with $314.1 million as of October 30, 2016. Our working capital increased $7.1 million to $367.3 million at October 29, 2017, compared with $360.3 million at October 30, 2016. We may use our available cash on hand for operations, capital expenditures, debt repayments, strategic opportunities, stock repurchases or other corporate uses, any of which may be material.

As of October 30, 2016, we had cash and cash equivalents of $314.1 million compared with $205.9 million as of November 1, 2015. Our working capital increased $192.2 million to $360.3 million at October 30, 2016, compared with $168.1 million (as retrospectively adjusted to reflect our adoption of ASU 2015-17 in the fourth quarter of fiscal year 2016) at November 1, 2015. The increase in cash and cash equivalents in 2016 was primarily attributable to the sale of our 49.99% interest in the MP Mask joint venture for $93.1 million and proceeds from the sale of an investment in a foreign entity of $8.8 million. The increase in working capital was the result of these same factors, as well as the conversion of $7.4 million of debt to common stock, reduced accounts payable and accrued expense balances as of the end of 2016 compared with the end of 2015, which were caused, in significant part, by lower accruals for capital expenditures and employee compensation.

As of October 29, 2017 and October 30, 2016, our total cash and cash equivalents included $190.0 million and $141.4 million, respectively, held by our foreign subsidiaries. The majority of earnings of our foreign subsidiaries are considered to be indefinitely reinvested. Repatriation of these funds to the U.S. may subject these funds to U.S. federal income taxes and local country withholding taxes in certain jurisdictions. Our foreign subsidiaries continue to grow through the reinvestment of earnings in additional manufacturing capacity and capability, particularly in the high-end IC and FPD areas.

Net cash provided by operating activities decreased by $25.3 million to $96.8 million in fiscal 2017, compared with $122.1 million in fiscal 2016, primarily due to the decrease of $34.4 million of net income. Net cash provided by operating activities decreased to $122.1 million in fiscal 2016, compared with $133.2 million in fiscal 2015, primarily

due to reduced year-over-year operating income, partially offset by net cash favorable changes in accrual accounts. Net cash provided by operating activities increased to $133.2 million in fiscal 2015, compared with $96.4 million in fiscal 2014, primarily due to increased net income in 2015, excluding the 2014 noncash gain on the acquisition of DPTT.

Cash flows from investing activities decreased from funds provided of $52.3 million in 2016 to $98.1 million used in fiscal year 2017 due to $101.9 million aggregate proceeds received from the sale of our investments in MP Mask and an interest we held in a foreign entity in fiscal 2016, compared to increased capital expenditures of $41.8 million and the acquisition of a business of $5.4 million in fiscal 2017. Cash flows from investing activities increased to $52.3 million provided in fiscal year 2016 from $104.3 used in fiscal year 2015, primarily due to proceeds of $101.9 million received from the sale of our investments in the MP Mask joint venture and an interest we held in a foreign entity, as well as decreased expenditures for capital equipment. Net cash used in investing activities in fiscal 2015 was $104.3 million primarily due to capital expenditure payments. Capital expenditure payments for the 2017, 2016, and 2015 fiscal years were $92.0, $50.1 million, and $104.0 million, respectively. We expect capital expenditure payments in fiscal 2018 to be approximately $250 million.

Net cash used in financing activities was $10.9 million in fiscal 2017, which primarily comprised repayments of long-term borrowings and a dividend paid to the noncontrolling interest in a subsidiary, partially offset by proceeds received from employee share-based arrangements. Net cash used in financing activities was $67.0 million in fiscal 2016, primarily comprised of repayments of long-term borrowings (including $50.1 million to retire our 3.25% convertible senior notes which matured in April 2016) and $11.9 million dividend paid to the noncontrolling interest in a subsidiary, partially offset by proceeds received from employee share-based arrangements. Net cash used in financing activities was $7.1 million in fiscal 2015, primarily comprised of repayments of borrowings, offset, in part, by proceeds from share-based arrangements.

Our liquidity, as we operate in a high fixed cost environment, is highly dependent on our revenue, cash conversion cycle, and the timing of our capital expenditures (which can vary significantly from period to period). Depending on conditions in the semiconductor and FPD markets, our cash flows from operations and current holdings of cash may not be adequate to meet our current and long-term needs for capital expenditures, operations and debt repayments. Historically, in certain years, we have used external financing to fund these needs. Due to conditions in the credit markets and covenant restrictions on our existing debt, some financing instruments we have used in the past may not be available to us when required. Although we continue to evaluate further cost reduction initiatives, we cannot assure that additional sources of financing would be available to us on commercially favorable terms, should our cash requirements exceed our existing cash and cash available under our credit facility.

At October 29, 2017, we had outstanding purchase commitments of $168 million, which included $162 million related to capital expenditures. We intend to finance our capital expenditures with our working capital, cash generated from operations, and, if necessary, with additional borrowings. We have agreed to enter into a joint venture that is constructing an IC facility in China with an estimated total investment of $160 million. Our funding commitment for the joint venture is approximately $80 million in the form of a combination of cash and transferred capital over the next several years. We have also entered into an agreement to construct an FPD facility in China in which we will invest $160 million over that same period.

Cash Requirements

Our cash requirements in fiscal 2018 will be primarily to: fund our operations; capital spending, including the construction of an IC research and development and manufacturing facility in Xiamen, China and an FPD manufacturing facility in Hefei, China; and service our debt. We believe that our cash on hand, cash generated from operations and amounts available to borrow will be sufficient to meet our cash requirements for the next twelve months. We regularly review the availability and terms at which we might issue additional equity or debt securities in the public or private markets. However, we cannot assure that additional sources of financing would be available to us on commercially favorable terms, should our cash requirements exceed our existing cash and cash available under our credit facility.

Contractual Obligations

The following table presents our contractual obligations as of October 29, 2017:

	Payment due by period				
Contractual Obligations	Total	Less Than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
Long-term borrowings	$57,500	$-	$57,500	$-	$-
Operating leases	4,012	1,138	1,123	751	1,000
Capital leases	4,639	4,639	-	-	-
Purchase obligations	168,219	160,534	7,685	-	-
Interest	2,987	2,053	934	-	-
Other noncurrent liabilities	10,897	-	2,164	1,733	7,000
Total	$248,254	$168,364	$69,406	$2,484	$8,000

Long-term borrowings of $57.5 million in the table above represent our obligation under our 3.25% senior convertible notes which, at the option of the note holders, may be settled either in cash or by conversion into our common stock. See Note 6 to the consolidated financial statements for additional information. As of October 29, 2017, the Company had recorded accruals for uncertain tax positions of $3.4 million which were not included in the above table due to the high degree of uncertainty regarding the timing of future payments related to such liabilities.

Off-Balance Sheet Arrangements

We own a 50.01% (controlling interest) of PDMC, our IC manufacturing facility located in Taiwan. Under the PDMC operating agreement, the shareholders of PDMC may be requested to make additional contributions to PDMC. In the event that PDMC requests additional capital from its shareholders, we may, in order to maintain our 50.01% ownership interest, be required to make such contributions to PDMC. The PDMC operating agreement limits the amount of contributions that may be requested both during the first four years of PDMC and during any individual year within those first four years. As of October 29, 2017, we had not been requested to make any additional capital contribution to PDMC.

We lease certain office facilities and equipment under operating leases that may require us to pay taxes, insurance and maintenance expenses related to the properties. Certain of these leases contain renewal or purchase options exercisable at the end of the lease terms. See Note 7 to the consolidated financial statements for additional information on these operating leases.

Business Outlook

A majority of our revenue growth is expected to continue to come from the Asian region, predominantly in China. In response to this expectation, we agreed to enter into a joint venture that will complete the construction of an IC research and development and manufacturing facility in Xiamen, China, in late 2018. Production is anticipated to begin at this facility in early 2019. In addition, in August 2017, we announced our plan to construct an FPD manufacturing facility in Hefei, China, in which production is also anticipated to begin in early 2019. Please refer to

Note 19 of our consolidated financial statements for additional information on these undertakings.

We continue to assess our global manufacturing strategy and monitor our sales volume and related cash flows from operations. This ongoing assessment could result in future facility closures, asset redeployments, additional impairments of intangible or long-lived assets, workforce reductions, or the addition of increased manufacturing facilities, all of which would be based on market conditions and customer requirements.

Our future results of operations and the other forward-looking statements contained in this filing involve a number of risks and uncertainties. While various risks and uncertainties have been discussed, a number of other unforeseen factors could cause actual results to differ materially from our expectations.

Critical Accounting Estimates

Our consolidated financial statements are based on the selection and application of accounting policies, which require management to make significant estimates and assumptions. We believe that the following are some of the more critical judgment areas in the application of our accounting policies that affect our financial condition and results of operations:

- the determination of the useful lives of our property, plant, and equipment and the timing of when depreciation should begin on such assets, as these determinations can significantly impact our gross margin and research and development expenses;

- the evaluation of the recoverability of our long-lived and definite-lived intangible assets, which requires us to forecast the future cash flows related to these assets, and impacts our gross margin and operating expenses;

- the estimation of the collectability of our accounts receivables, which impacts our gross margin and operating expenses;

- the recognition and measurement of current and deferred income taxes, including the measurement of uncertain tax positions, which impact our provision for income taxes and our tax-related asset and liability balances.

Please refer to Note 1 to our consolidated financial statements for additional information on these critical accounting estimates and our other significant accounting policies.

Recent Accounting Pronouncements

See “Item 8. Financial Statements and Supplementary Data – Notes to Consolidated Financial Statements – Note 21 Recent Accounting Pronouncements” for recent accounting pronouncements that may affect our financial reporting.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Foreign Currency Exchange Rate Risk

We conduct business in several major international currencies throughout our worldwide operations, and our financial performance may be affected by fluctuations in the exchange rates of these currencies. Changes in exchange rates can positively or negatively affect our reported revenue, operating income, assets, liabilities, and equity. The functional currencies of our Asian subsidiaries are the South Korean won, the New Taiwan dollar, the Chinese renminbi and the Singapore dollar. The functional currencies of our European subsidiaries are the British pound and the euro. In addition, we have transactions and balances in Japanese yen.

We attempt to minimize our risk of foreign currency transaction losses by producing products in the same country in which the products are sold (thereby generating revenues and incurring expenses in the same currency), and by managing our working capital. There can be no assurance that this approach will continue to be successful, especially

in the event of a significant adverse movement in the value of any foreign currency against the U.S. dollar, the New Taiwan dollar, the South Korean won, the Chinese renminbi, the Singapore dollar, the British pound, or the euro. However, in some instances, we sell products in a currency other than the functional currency of the country where it was produced, or purchase products in a currency that differs from the functional currency of the purchasing manufacturing facility.

Our primary net foreign currency exposures as of October 29, 2017, included the South Korean won, the Japanese yen, the New Taiwan dollar, the Chinese renminbi, the Singapore dollar, the British pound, and the euro. As of October 29, 2017, a 10% adverse movement in the value of these currencies against the functional currencies of our subsidiaries would have resulted in a net unrealized pre-tax loss of $13.0 million, which represents an increase of $3.9 million from October 30, 2016. The increase in foreign currency rate change risk is primarily the result of increased exposures of the Chinese renminbi against the U.S. dollar, and the Taiwan dollar against the U.S. dollar and, to a lesser extent, the Japanese yen. We do not believe that a 10% change in the exchange rates of other non-US dollar currencies would have had a material effect on our October 29, 2017 consolidated financial statements.

Interest Rate Risk

At October 29, 2017, we did not have any variable rate borrowings. Therefore, a 10% change in interest rates would not have had a material effect on our consolidated financial position, results of operations, or cash flows in the year ended October 29, 2017.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders
Photronics, Inc.
Brookfield, Connecticut

We have audited the accompanying consolidated balance sheets of Photronics, Inc. and subsidiaries (the "Company") as of October 29, 2017 and October 30, 2016, and the related consolidated statements of income, consolidated statements of comprehensive income, consolidated statements of equity, and consolidated statements of cash flows for each of the fiscal years ended October 29, 2017, October 30, 2016, and November 1, 2015. We also have audited the Company's internal control over financial reporting as of October 29, 2017, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting in Item 9A. Our responsibility is to express an opinion on these financial statements and an opinion on the Company's internal control over financial reporting based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

A company's internal control over financial reporting is a process designed by, or under the supervision of, the company's principal executive and principal financial officers, or persons performing similar functions, and effected by the company's board of directors, management, and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of the inherent limitations of internal control over financial reporting, including the possibility of collusion or improper management override of controls, material misstatements due to error or fraud may not be prevented or detected on a timely basis. Also, projections of any evaluation of the effectiveness of the internal control over financial reporting to future periods are subject to the risk that the controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Photronics, Inc. and subsidiaries as of October 29, 2017 and October 30, 2016, and the results of their operations and their cash flows for each of the fiscal years ended October 29, 2017, October 30, 2016, and November 1, 2015, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of October 29, 2017, based on the criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

/s/ Deloitte & Touche LLP
Hartford, Connecticut
December 20, 2017

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PHOTRONICS, INC. AND SUBSIDIARIES
Consolidated Balance Sheets
(in thousands, except per share amounts)

	October 29, 2017	October 30, 2016
ASSETS		
Current assets:		
Cash and cash equivalents	$308,021	$314,074
Accounts receivable, net of allowance of $2,319 in 2017 and $3,901 in 2016	105,320	92,636
Inventories	23,703	22,081
Other current assets	12,080	12,795
Total current assets	449,124	441,586
Property, plant and equipment, net	535,197	506,434
Intangible assets, net	17,122	19,854
Deferred income taxes	15,481	16,322
Other assets	3,870	3,792
Total assets	$1,020,794	$987,988
LIABILITIES AND EQUITY		
Current liabilities:		
Current portion of long-term borrowings	$4,639	$5,428
Accounts payable	50,834	48,906
Payables – related parties	-	2,743
Accrued liabilities	26,303	24,240
Total current liabilities	81,776	81,317
Long-term borrowings	57,337	61,860
Deferred income taxes	2,049	1,491
Other liabilities	14,337	17,846
Total liabilities	155,499	162,514
Commitments and contingencies		
Equity:		
Preferred stock, $0.01 par value, 2,000 shares authorized, none issued and outstanding	-	-
Common stock, $0.01 par value, 150,000 shares authorized, 68,666 shares issued and outstanding at October 29, 2017, 68,080 shares issued and outstanding at October 30, 2016	687	681
Additional paid-in capital	547,596	541,093
Retained earnings	189,390	176,260
Accumulated other comprehensive income (loss)	6,891	(7,671)
Total Photronics, Inc. shareholders' equity	744,564	710,363
Noncontrolling interests	120,731	115,111
Total equity	865,295	825,474
Total liabilities and equity	$1,020,794	$987,988

See accompanying notes to consolidated financial statements.

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PHOTRONICS, INC. AND SUBSIDIARIES
Consolidated Statements of Income
(in thousands, except per share amounts)

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Revenue	$450,678	$483,456	$524,206
Cost of goods sold	(359,363)	(364,750)	(381,070)
Gross profit	91,315	118,706	143,136
Operating expenses:			
Selling, general and administrative	(43,585)	(44,577)	(48,983)
Research and development	(15,862)	(21,654)	(21,920)
Total operating expenses	(59,447)	(66,231)	(70,903)
Operating income	31,868	52,475	72,233
Other income (expense):			
Interest income and other income (expense)	(3,068)	2,424	2,797
Interest expense	(2,235)	(3,365)	(4,990)
Gains on sales of investments	-	8,940	-
Income before income tax provision	26,565	60,474	70,040
Income tax provision	(5,276)	(4,798)	(13,181)
Net income	21,289	55,676	56,859
Net income attributable to noncontrolling interests	(8,159)	(9,476)	(12,234)
Net income attributable to Photronics, Inc. shareholders	$13,130	$46,200	$44,625
Earnings per share:			
Basic	$0.19	$0.68	$0.67
Diluted	$0.19	$0.64	$0.63
Weighted-average number of common shares outstanding:			

Basic	68,436	67,539	66,331
Diluted	69,288	76,354	78,383

See accompanying notes to consolidated financial statements.

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PHOTRONICS, INC. AND SUBSIDIARIES
Consolidated Statements of Comprehensive Income
(in thousands)

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Net income	$21,289	$ 55,676	$ 56,859
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	19,799	6,334	(40,154)
Amortization of cash flow hedge	129	129	128
Other	478	(589)	(381)
Net other comprehensive income (loss)	20,406	5,874	(40,407)
Comprehensive income	41,695	61,550	16,452
Less: comprehensive income attributable to noncontrolling interests	14,003	12,448	4,174
Comprehensive income attributable to Photronics, Inc. shareholders	$27,692	$ 49,102	$ 12,278

See accompanying notes to consolidated financial statements.

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PHOTRONICS, INC. AND SUBSIDIARIES
Consolidated Statements of Equity
Years Ended October 29, 2017 October 30, 2016 and November 1, 2015
(in thousands)

	Common Stock		Additional Paid-In	Retained	Accumulated Other Comprehensive	Non-Controlling	Total
	Shares	Amount	Capital	Earnings	Income (Loss)	Interests	Equity
Balance at November 2, 2014	65,930	$ 659	$ 520,182	$ 85,435	$ 21,774	$ 111,444	$ 739,494
Net income	-	-	-	44,625	-	12,234	56,859
Other comprehensive loss	-	-	-	-	(32,347)	(8,060)	(40,407)
Sales of common stock through employee stock option and purchase plan	513	5	2,505	-	-	-	2,510
Restricted stock awards vesting and expense	159	2	1,064	-	-	-	1,066
Share-based compensation expense	-	-	2,623	-	-	-	2,623
Repurchase of common stock by subsidiary	-	-	28	-	-	(107)	(79)
Balance at November 1, 2015	66,602	666	526,402	130,060	(10,573)	115,511	762,066
Net income	-	-	-	46,200	-	9,476	55,676
Other comprehensive income	-	-	-	-	2,902	2,972	5,874
Sales of common stock through employee stock option and purchase plan	618	6	3,441	-	-	-	3,447
Restricted stock awards vesting and expense	143	2	1,190	-	-	-	1,192
Share-based compensation expense	-	-	2,637	-	-	-	2,637
Conversion of debt to common stock	717	7	7,431	-	-	-	7,438
Dividends to noncontrolling interests	-	-	-	-	-	(11,901)	(11,901)
Return of capital to noncontrolling interest	-	-	-	-	-	(955)	(955)
Repurchase of common stock by subsidiary	-	-	(8)	-	-	8	-
Balance at October 30, 2016	68,080	681	541,093	176,260	(7,671)	115,111	825,474

Net income	-	-	-	13,130	-	8,159	21,289
Other comprehensive income	-	-	-	-	14,562	5,844	20,406
Sales of common stock through employee stock option and purchase plan	459	5	2,877	-	-	-	2,882
Restricted stock awards vesting and expense	127	1	1,508	-	-	-	1,509
Share-based compensation expense	-	-	2,118	-	-	-	2,118
Dividends to noncontrolling interests	-	-	-	-	-	(8,383)	(8,383)
Balance at October 29, 2017	68,666	$ 687	$ 547,596	$189,390	$ 6,891	$ 120,731	$865,295

See accompanying notes to consolidated financial statements.

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PHOTRONICS, INC. AND SUBSIDIARIES
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Cash flows from operating activities:			
Net income	$21,289	$ 55,676	$ 56,859
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization of property, plant and equipment	81,699	77,613	75,684
Amortization of intangible assets	4,874	5,228	6,729
Gains on sales of investments	-	(8,940)	-
Share-based compensation	3,627	3,827	3,689
Deferred income taxes	1,633	(3,816)	3,401
Changes in assets, liabilities, and other:			
Accounts receivable	(9,625)	18,807	(21,815)
Inventories	(602)	2,268	(2,893)
Other current assets	1,127	7,936	(2,557)
Accounts payable, accrued liabilities and other	(7,189)	(36,462)	14,098
Net cash provided by operating activities	96,833	122,137	133,195
Cash flows from investing activities:			
Purchases of property, plant and equipment	(91,965)	(50,147)	(104,033)
Acquisition of business	(5,400)	-	-
Proceeds from sales of investments	167	101,853	-
Purchases of intangible assets	(834)	(13)	(771)
Other	(34)	597	499
Net cash (used in) provided by investing activities	(98,066)	52,290	(104,305)
Cash flows from financing activities:			
Repayments of long-term borrowings	(5,428)	(57,609)	(9,571)
Dividends paid to noncontrolling interests	(8,298)	(11,890)	-
Proceeds from share-based arrangements	2,830	3,463	2,651
Return of capital to noncontrolling interests	-	(966)	-
Other	(32)	(20)	(179)
Net cash used in financing activities	(10,928)	(67,022)	(7,099)
Effects of exchange rate changes on cash and cash equivalents	6,108	802	(8,853)
Net (decrease) increase in cash and cash equivalents	(6,053)	108,207	12,938
Cash and cash equivalents at beginning of year	314,074	205,867	192,929

Cash and cash equivalents at end of year	$308,021	$ 314,074	$ 205,867
Supplemental disclosure of non-cash information:			
Accrual for property, plant and equipment purchased during year	$2,767	$ 7,866	$ 25,858
Conversion of debt to common stock	-	7,439	-

See accompanying notes to consolidated financial statements.

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PHOTRONICS, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
Years Ended October 29, 2017, October 30, 2016 and November 1, 2015
(in thousands, except share amounts)

NOTE 1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Business

Photronics, Inc. and its subsidiaries ("Photronics", the "Company", "we", "our", or "us") is one of the world's leading manufacturers of photomasks, which are high precision photographic quartz plates containing microscopic images of electronic circuits. Photomasks are a key element in the manufacture of semiconductors and flat panel displays ("FPDs"), and are used as masters to transfer circuit patterns onto semiconductor wafers and flat panel display substrates during the fabrication of integrated circuits ("ICs" or semiconductors) and a variety of FPDs and, to a lesser extent, other types of electrical and optical components. The Company currently operates principally from nine manufacturing facilities; two of which are located in Europe, three in Taiwan, one in Korea, and three in the United States. We have announced plans to construct two manufacturing facilities in China. See Note 19 for additional information.

Consolidation

The accompanying consolidated financial statements include the accounts of Photronics, Inc. and majority-owned subsidiaries that it controls. All intercompany balances and transactions have been eliminated in consolidation.

Estimates and Assumptions

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires us to make estimates and assumptions that affect amounts reported in them. Estimates are based on historical experience and on various assumptions that are believed to be reasonable under the circumstances. Our estimates are based on the facts and circumstances available at the time they are made. Actual results we report may differ from such estimates. We review these estimates periodically and reflect any effects of revisions in the period in which they are determined.

Fiscal Year

Our fiscal year ends on the Sunday closest to October thirty-first, and, as a result, a 53-week year occurs every 5 to 6 years. Fiscal years 2017, 2016 and 2015 each included 52 weeks.

Cash and Cash Equivalents

Cash and cash equivalents include cash and highly liquid investments purchased with an original maturity of 3 months or less. The carrying values of cash equivalents approximate their fair values, due to the short-term maturities of these instruments.

Accounts Receivable and Allowance for Doubtful Accounts

We generally record our trade accounts receivable at their billed amounts. All outstanding past due customer invoices are reviewed during and at the end of every reporting period for collectability. When, in the judgment of management, a loss on the collection of a customer invoice is probable, the amount is charged to expense and credited to the allowance for doubtful accounts. When the amount is determined to be uncollectible, the amount is charged to the allowance for doubtful accounts, and the related receivable is eliminated.

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Inventories

Inventories are stated at the lower of cost, determined under the first-in, first-out ("FIFO") method, or market. Presented below are the components of inventory at the balance sheet dates:

	October 29 2017	October 30, 2016
Finished goods	$ 664	$ 142
Work in process	2,957	2,987
Raw materials	20,082	18,952
	$ 23,703	$ 22,081

Property, Plant and Equipment

Property, plant and equipment, except as explained below under "Impairment of Long-Lived Assets," is stated at cost less accumulated depreciation and amortization. Repairs and maintenance, as well as renewals and replacements of a routine nature, are charged to operations as incurred, while those that improve, or extend the lives of, existing assets are capitalized. Upon sale or other disposition, the cost of the asset and its related accumulated depreciation are removed from the accounts, and any resulting gain or loss is reflected in earnings.

Depreciation and amortization, substantially all of which are included in cost of goods sold, are computed using the straight-line method over the estimated useful lives of the related assets. Buildings and improvements are depreciated over 15 to 40 years, machinery and equipment over 3 to 10 years, and furniture, fixtures and office equipment over 3 to 5 years. Leasehold improvements are amortized over the life of the lease or the estimated useful life of the improvement, whichever is less. We employ judgment and assumptions when we establish estimated useful lives and depreciation periods, as well as when we periodically review property, plant and equipment for any potential impairment in carrying values, whenever events such as a significant industry downturn, plant closures, technological obsolescence, or other change in circumstances indicate that their carrying amounts may not be recoverable.

Intangible Assets

Intangible assets consist primarily of a technology license agreement and acquisition-related intangibles. These assets, except as explained below, are stated at fair value as of the date acquired, less accumulated amortization. Amortization is calculated based on the estimated useful lives of the assets, which range from 3 to 15 years, using the straight-line method or another method that more fairly represents the utilization of the assets.

We periodically evaluate the remaining useful lives of our intangible assets to determine whether events or circumstances warrant a revision to the remaining periods of amortization. In the event that the estimate of an intangible asset's remaining useful life has changed, the remaining carrying amount of the intangible asset is amortized prospectively over that revised remaining useful life. If it is determined that an intangible asset has an indefinite useful life, that intangible asset would be subject to impairment testing annually or whenever events or circumstances indicate that its carrying value may not, based on future undiscounted cash flows or market factors, be recoverable; and an impairment loss would be recorded in the period where the impairment determination is made. The amount of the impairment loss recorded would be based on the fair value of the intangible asset at the measurement date.

Impairment of Long-Lived Assets

Long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. Determinations of recoverability are based upon our judgment and

estimates of undiscounted future cash flows resulting from the use of the assets and their eventual disposition. Measurement of an impairment loss for long-lived assets that we expect to hold and use is based on the fair value of the assets determined using a market or income approach compared to the carrying value of the asset. The carrying values of assets determined to be impaired are reduced to their estimated fair values.

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Business Combinations

When acquiring other businesses, or participating in mergers or joint ventures in which we are deemed to be the acquirer, we generally recognize identifiable assets acquired, liabilities assumed and any noncontrolling interests at their acquisition date fair values, separately from any goodwill that may be required to be recognized. Goodwill, when recognizable, would be measured as the excess amount of any consideration transferred, which is generally measured at fair value, over the acquisition date fair values of the identifiable assets acquired and liabilities assumed.

Accounting for such transactions requires us to make significant assumptions and estimates and, although we believe any estimates and assumptions we make to be reasonable and appropriate at the time they are made, unanticipated events and circumstances may arise that affect their accuracy, which may cause actual results to differ from those we estimated. When required, we will adjust the values of the assets acquired and liabilities assumed against the acquisition gain or goodwill, as initially recorded, for a period of up to one year after the transaction.

Costs incurred to effect a merger or acquisition, such as legal, accounting, valuation and other third party costs, as well as internal general and administrative costs incurred are charged to expense in the periods incurred. Costs incurred to issue any debt and equity securities are recognized in accordance with other applicable generally accepted accounting principles.

Investments in Joint Ventures

The financial results of investments in joint ventures of which we have a controlling financial interest are included in our consolidated financial statements. Investments in joint ventures over which we have the ability to exercise significant influence and that, in general, are at least 20 percent owned are accounted for under the equity method. An impairment loss would be recognized whenever a decrease in the fair value of such an investment below its carrying amount is determined to be other than temporary. In judging “other than temporary,” we would consider the length of time and the extent to which the fair value of the investment has been less than the carrying amount of the investment, the near-term and longer-term operating and financial prospects of the investee, and our longer-term intent of retaining our investment in the investee.

Variable Interest Entities

We account for the investments we make in certain legal entities in which equity investors do not have 1) sufficient equity at risk for the legal entity to finance its activities without additional subordinated financial support or, 2) as a group, the holders of the equity investment at risk do not have either the power, through voting or similar rights, to direct the activities of the legal entity that most significantly impact the entity’s economic performance or, 3) the obligation to absorb the expected losses of the legal entity or the right to receive expected residual returns of the legal entity as “variable interest entities”, or “VIEs”.

We would consolidate the results of any such entity in which we determined that we have a controlling financial interest. We would have a “controlling financial interest” in such an entity when we have both the power to direct the activities that most significantly affect the VIE’s economic performance and the obligation to absorb the losses of, or right to receive the benefits from, the VIE that could be potentially significant to the VIE. On a quarterly basis, we would reassess whether we have a controlling financial interest in any investments we have in these certain legal entities.

We account for investments we make in VIEs in which we have determined that we do not have a controlling financial interest but have a significant influence over, and hold at least a 20 percent ownership interest in, using the equity method. Any such investment not meeting the parameters to be accounted for under the equity method would be accounted for using the cost method, unless the investment had a readily determinable fair value, at which value it

would then be reported.

Income Taxes

The income tax provision is computed on the basis of the various tax jurisdictions' income or loss before income taxes. Deferred income taxes reflect the tax effects of differences between the carrying amounts of assets and liabilities for financial reporting purposes and their amounts used for income tax purposes, as well as the tax effects of net operating losses and tax credit carryforwards. We use judgment and make assumptions to determine if valuation allowances for deferred income tax assets are required, if their realization is not more likely than not, by considering future market growth, operating forecasts, future taxable income, and the mix of earnings among the tax jurisdictions in which we operate. Accordingly, income taxes charged against earnings may have been impacted by changes in the valuation allowances.

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We consider income taxes in each of the tax jurisdictions in which we operate in order to determine our effective income tax rate. Our current income tax expense is thus identified, and temporary differences resulting from differing treatments of items for tax and financial reporting purposes are assessed. These differences result in deferred tax assets and liabilities, which are included in our consolidated balance sheets.

We account for uncertain tax positions by recording a liability for unrecognized tax benefits resulting from uncertain tax positions taken, or expected to be taken, in our tax returns. We include any applicable interest and penalties related to uncertain tax positions in our income tax provision.

Earnings Per Share

Basic earnings per share ("EPS") is based on the weighted-average number of common shares outstanding for the period, excluding any dilutive common share equivalents. Diluted EPS reflects the potential dilution that could occur if certain share-based payment awards or financial instruments were exercised, earned or converted.

Share-Based Compensation

We recognize share-based compensation expense over the service period that the awards are expected to vest. Share-based compensation expense includes the estimated effects of forfeitures, which are adjusted over the requisite service period to the extent actual forfeitures differ, or are expected to differ, from such estimates. Changes in estimated forfeitures are recognized in the period of change, and will impact the amount of expense to be recognized in future periods. Determining the appropriate option pricing model, calculating the grant date fair value of share-based awards and estimating forfeiture rates requires considerable judgment, including estimations of stock price volatility and the expected term of options granted.

We use the Black-Scholes option pricing model to value employee stock options. We estimate stock price volatility based on daily averages of our common stock's historical volatility over a term approximately equal to the estimated time period the grant will remain outstanding. The expected term of options and forfeiture rate assumptions are derived from historical data.

Research and Development

Research and development costs are expensed as incurred, and consist primarily of development efforts related to high-end process technologies for advanced sub-wavelength reticle solutions for IC photomask technologies.

Foreign Currency Translation

Our non-US subsidiaries maintain their accounts in their respective local currencies. Assets and liabilities of such subsidiaries are translated to U.S. dollars at year-end exchange rates. Income and expenses are translated at average rates of exchange prevailing during the year. Foreign currency translation adjustments are accumulated and reported in accumulated other comprehensive income, a component of equity. The effects of changes in exchange rates on foreign currency transactions, which are included in interest income and other income (expense) were a net gain/(loss) of $(5.2) million, $(0.3) million and $2.5 million in fiscal years 2017, 2016 and 2015, respectively.

Noncontrolling Interests

Noncontrolling interests represents the minority shareholders' proportionate share in the equity of the Company's two majority-owned subsidiaries, Photronics DNP Mask Corporation ("PDMC") in Taiwan, of which noncontrolling interests owned 49.99% as of October 29, 2017 and October 30, 2016, and PK Ltd. ("PKL") in Korea of which noncontrolling shareholders owned approximately 0.3% as of October 29, 2017 and October 30, 2016.

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Revenue Recognition

We recognize revenue when there is persuasive evidence that an arrangement exists, delivery has occurred, the sales price of the transaction is fixed or determinable, and collectability is reasonably assured. Delivery is determined by the shipping terms of the individual revenue transactions. For transactions with FOB destination or similar shipping terms, delivery occurs when our product reaches its destination and is received by the customer. For transactions with FOB shipping point terms, delivery occurs when our product is received by the common carrier. We use judgment when estimating the effect on revenue of discounts and sales incentives, both of which are accrued when the related revenue is recognized. Our revenue is reported net of any sales taxes billed to customers.

Product Warranty

For a 30-day period, we warrant that items sold will conform to customer specifications. However, our liability is limited to the repair or replacement of the photomasks at our sole option. We inspect photomasks for conformity to customer specifications prior to shipment. Accordingly, customer claims related to items under warranty have historically been insignificant. Our warranty policy includes accepting returns of products with defects, or products that have not been produced to precise customer specifications.

NOTE 2 - PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consists of the following:

	October 29, 2017	October 30, 2016
Land	$9,959	$8,036
Buildings and improvements	125,290	121,873
Machinery and equipment	1,547,870	1,475,755
Leasehold improvements	20,050	19,224
Furniture, fixtures and office equipment	12,989	12,700
Construction in progress	72,045	23,961
	1,788,203	1,661,549
Less: Accumulated depreciation and amortization	1,253,006	1,155,115
	$535,197	$506,434

Property under capital leases is included in above property, plant and equipment as follows:

	October 29, 2017	October 30, 2016
Machinery and equipment	$ 34,917	$ 34,917
Less accumulated amortization	13,843	10,352
	$ 21,074	$ 24,565

During the three month period ended January 29, 2017, we acquired a business comprised of manufacturing assets and certain intellectual property that enables us to expand our manufacturing capability, primarily in large area masks for IC, for approximately $5.7 million, including a $0.3 million holdback payable one year from the acquisition date. The transaction was accounted for in accordance with ASC 805, “Business Combinations”, with substantially all of the purchase price being allocated to long-lived assets that are being depreciated over five years.

During the three month period ended January 29, 2017, we entered into a noncash transaction with a customer which resulted in the acquisition of equipment with a fair value of approximately $9.0 million in fiscal year 2017.

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NOTE 3 - INTANGIBLE ASSETS

Amortization expense of the Company's finite-lived intangible assets was $4.9 million, $4.8 million and $6.0 million in fiscal years 2017, 2016 and 2015, respectively.

Intangible assets consist of:

As of October 29, 2017	Gross Amount	Accumulated Amortization	Net Amount
Technology license agreement	$59,616	$ (45,374)	$14,242
Customer relationships	9,375	(7,793)	1,582
Software and other	8,195	(6,897)	1,298
	$77,186	$ (60,064)	$17,122
As of October 30, 2016			
Technology license agreement	$59,616	$ (41,400)	$18,216
Customer relationships	8,657	(7,522)	1,135
Software and other	6,444	(5,941)	503
	$74,717	$ (54,863)	$19,854

The weighted-average amortization period of intangible assets acquired in fiscal year 2017 was 4.5 years, primarily comprised of acquired customer relationships and technology that has an amortization period of five years, and software that has an amortization period of three years. The weighted-average amortization period of intangible assets acquired in fiscal year 2016, which is comprised of software, is three years.

Intangible asset amortization over the next five years is estimated to be as follows:

Fiscal Years:	
2018	$4,742
2019	4,564
2020	4,510
2021	2,747
2022	128

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NOTE 4- JOINT VENTURE, TECHNOLOGY LICENSE AND OTHER AGREEMENTS WITH MICRON TECHNOLOGY, INC.

In May 2006, Photronics and Micron Technology, Inc. (“Micron”) entered into the MP Mask joint venture (“MP Mask”), which developed and produced photomasks for leading-edge and advanced next generation semiconductors. At the time of the formation of the joint venture, we also entered into an agreement to license photomask technology developed by Micron and certain supply agreements. In May 2016, we sold our investment in MP Mask to Micron for $93.1 million and recorded a gain on the sale of $0.1 million, which is included in our 2016 consolidated statement of income in interest income and other income (expense). On that same date a supply agreement commenced between Photronics and Micron, which provided that we would be the majority outsourced supplier of Micron’s photomasks and related services. The supply agreement had a one year term and expired in May 2017. However, we have the unlimited rights to use technology under the prior technology license agreement.

This joint venture was a variable interest entity (“VIE”) (as that term is defined in ASC 810) because all costs of the joint venture were passed on to Photronics and Micron through purchase agreements they had entered into with the joint venture, and it was dependent upon Photronics and Micron for any additional cash requirements. On a quarterly basis we reassessed whether our interest in MP Mask gave us a controlling financial interest in this VIE. The purpose of this quarterly reassessment was to identify the primary beneficiary (which is defined in ASC 810 as the entity that consolidates a VIE) of the VIE. As a result of the reassessments in fiscal year 2016, we determined that Micron remained the primary beneficiary of the VIE, by virtue of its tie-breaking voting rights within MP Mask’s Board of Managers, thereby having given it the power to direct the activities of MP Mask that most significantly impacted its economic performance, including its decision making authority in the ordinary course of business and its purchase of the majority of products produced by the VIE.

We utilized MP Mask for both high-end IC photomask production and research and development purposes. MP Mask charged its variable interest holders based on their actual usage of its facility and charged separately for any research and development activities it engaged in at the requests of its owners.

MP Mask was governed by a Board of Managers appointed by Micron and Photronics. Since MP Mask’s inception, Micron, as a result of its majority ownership, had held majority voting power on the Board of Managers. The voting power held by each party was subject to change as ownership interests changed. Under the MP Mask joint venture operating agreement, we may have been required to make additional capital contributions to MP Mask up to the maximum amount defined in the operating agreement. However, had the Board of Managers determined that further additional funding was required, MP Mask would have pursued its own financing. If MP Mask was unable to obtain its own financing, it may have requested additional capital contributions from us. Had we chosen not to make a requested contribution to MP Mask, our ownership percentage may have been reduced. MP Mask did not request, and we did not make, any contributions to MP Mask in fiscal year 2016, and we did not receive any distributions (other than upon the sale of our investment to Micron in fiscal year 2016) from MP Mask during 2016.

We recorded losses from operations from our investment in MP Mask of $0.1 million in fiscal years 2016 and 2015. Income (loss) from MP Mask is included in Interest and other income, net, in our consolidated statements of income.

In fiscal 2016, we recorded $0.4 million of commission revenue earned under the supply agreements with Micron and MP Mask, and amortization of $0.1 million of the related supply agreement intangible asset. In 2016, we also recorded cost of goods sold in the amount of $5.7 million for photomasks produced by MP Mask for Photronics customers, and incurred expenses of $0.5 million for research and development activities and other goods and services purchased from MP Mask by Photronics.

In fiscal 2015, we recorded $0.8 million of commission revenue earned under the supply agreements with Micron and MP Mask, and amortization of $0.2 million of the related supply agreement intangible asset. In 2015, we also

recorded cost of goods sold in the amount of $4.8 million for photomasks produced by MP Mask for Photronics customers, and incurred expenses of $3.1 million for research and development activities and other goods and services purchased from MP Mask by Photronics.

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Summarized financial information of MP Mask is presented below. The financial results of 2016 are through May 5, 2016, the date of the sale of the Joint Venture.

	Fiscal Year	
	2016	2015
Revenue	$49,626	$96,068
Gross profit	2,736	1,215
Net loss	-	(151)

NOTE 5 - ACCRUED LIABILITIES

Accrued liabilities at October 29, 2017 included salaries, wages and related benefits of $10.0 million, unearned revenue of $5.7 million, value added and other taxes of $3.1 million, and other accruals of $7.5 million. At October 30, 2016, accrued liabilities included salaries, wages and related benefits of $8.2 million, income taxes of $6.2 million, and other accruals of $9.8 million.

NOTE 6 - LONG-TERM BORROWINGS

Long-term borrowings consist of the following:

	October 29, 2017	October 30, 2016
3.25% convertible senior notes due in April 2019	$ 57,337	$ 57,221
2.77% capital lease obligation payable through July 2018	4,639	10,067
	61,976	67,288
Less current portion	4,639	5,428
	$ 57,337	$ 61,860

In April 2016, $57.5 million of our senior convertible notes matured. We repaid $50.1 million to noteholders and issued approximately 0.7 million shares to noteholders that elected to convert their notes to common stock. The notes were exchanged at the rate of approximately 96 shares per $1,000 note principle, equivalent to a conversion rate of $10.37 per share.

In January 2015, we privately exchanged $57.5 million in aggregate principal amount of our 3.25% convertible senior notes with a maturity date of April 1, 2016, for new 3.25% convertible senior notes with an aggregate principal amount of $57.5 million with a maturity date of April 1, 2019. The conversion rate of the new notes is the same as that of the exchanged notes, which were issued in March 2011 with a conversion rate of approximately 96 shares of common stock per $1,000 note principal, equivalent to a conversion price of $10.37 per share of common stock, and is subject to adjustment upon the occurrence of certain events, which are described in the indenture dated January 22, 2015. Note holders may convert each $1,000 principal amount of notes at any time prior to the close of business on the second scheduled trading day immediately preceding April 1, 2019, and we are not required to redeem the notes prior to their maturity date. Interest on the notes accrues in arrears, and is paid semiannually through the notes' maturity date.

Our credit facility, which expires in December 2018, has a $50 million limit with an expansion capacity to $75 million, and is secured by substantially all of our assets located in the United States and common stock we own in

certain of our foreign subsidiaries. The credit facility stipulates that we may not pay cash dividends on Photronics, Inc. stock, and is subject to a minimum interest coverage ratio, total leverage ratio and minimum unrestricted cash balance financial covenants, all of which we were in compliance with at October 29, 2017. We had no outstanding borrowings against the credit facility at October 29, 2017, and $50 million was available for borrowing. The interest rate on the credit facility (2.49% at October 29, 2017) is based on our total leverage ratio at LIBOR plus a spread, as defined in the credit facility. In May 2017, the credit facility was amended to add certain covenants for our planned IC joint venture and FPD manufacturing facility, both of which are in China. See Note 19 for additional discussion of these new investments.

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In August 2013, a $26.4 million principal amount, five year capital lease commenced to fund the purchase of a high-end lithography tool. Payments under the capital lease, which bears interest at 2.77%, are $0.5 million per month through July 2018. The lease is subject to a cross default with cross acceleration provision related to certain nonfinancial covenants incorporated into our credit facility. As of October 29, 2017, the total amount payable through August 2018 (the end of the lease term) was $4.7 million, of which $4.6 million represented principal and $0.1 million represented interest.

Interest payments were $2.1 million, $3.2 million, and $4.4 million in fiscal years 2017, 2016 and 2015.

Adoption of New Accounting Standard

We adopted Accounting Standards Update ("ASU") 2015-03 – "Simplifying the Presentation of Debt Issuance Costs" in the first quarter of fiscal year 2017. This ASU requires debt issuance costs related to recognized debt liabilities to be presented in the balance sheet as a direct deduction from that debt liability, consistent with the presentation of a debt discount. We adopted this ASU on a retrospective basis, as a result of which our prior year financial statements and related notes have been adjusted, as necessary, to show its effects on those periods. The effect of adopting ASU 2015-03 on the other assets and long-term borrowing line items in the fiscal 2016 balance sheet is presented below.

Classification	Previously Reported	Change Due to Adoption	Retrospectively Adjusted
Other assets	$ 4,071	$ (279)	$ 3,792
Long-term borrowings	62,139	(279)	61,860

NOTE 7 - OPERATING LEASES

We lease various real estate and equipment under non-cancelable operating leases, for which rent expense was $3.0 million in 2017 and $2.8 million in each of fiscal years 2016 and 2015.

At October 29, 2017, future minimum lease payments under non-cancelable operating leases with initial terms in excess of one year were as follows:

2018	$1,051
2019	684
2020	439
2021	380
2022	371
Thereafter	1,000
	$3,925

See Note 6 for disclosures related to capital lease obligations.

NOTE 8 – SHARE-BASED COMPENSATION

In March 2016, shareholders approved a new equity incentive compensation plan ("the Plan"), under which incentive stock options, non-qualified stock options, stock grants, stock-based awards, restricted stock, restricted stock units, stock appreciation rights, performance units, performance stock, and other stock or cash awards may be granted. Shares to be issued under the Plan may be authorized and unissued shares, issued shares that have been reacquired by us (in the open-market or in private transactions), shares that are being held in the treasury, or a combination thereof. The maximum number of shares of common stock approved that may be issued under the Plan is four million shares.

Awards may be granted to officers, employees, directors, consultants, advisors, and independent contractors of Photronics or its subsidiaries. In the event of a change in control (as defined in the Plan), the vesting of awards may be accelerated. The Plan, aspects of which are more fully described below, prohibits further awards from being issued under prior plans. We incurred total share-based compensation expenses of $3.6 million, $3.8 million, and $3.7 million in fiscal years 2017, 2016, and 2015, respectively. No share-based compensation cost was capitalized as part of an asset and no related income tax benefits were recorded during the fiscal years presented.

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Stock Options

Option awards generally vest in one-to-four years, and have a ten year contractual term. All incentive and non-qualified stock option grants must have an exercise price no less than the market value of the underlying common stock on the date of grant. The grant date fair values of options are based on the closing price of our common stock on the date of grant, and are calculated using the Black-Scholes option pricing model. Expected volatility is based on the historical volatility of our common stock. We use historical option exercise behavior and employee termination data to estimate expected term, which represents the period of time that the options granted are expected to remain outstanding. The risk-free rate of return for the estimated term of the option is based on the U.S. Treasury yield curve in effect at the date of grant.

The weighted-average inputs and risk-free rate of return ranges used to calculate the grant date fair values of stock options issued during fiscal years 2017, 2016 and 2015 are presented in the following table:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Expected volatility	32.2 %	48.4 %	53.7 %
Risk-free rate of return	1.9 – 2.0%	1.2 – 1.7 %	1.3 – 1.6 %
Dividend yield	0.0 %	0.0 %	0.0 %
Expected term	5.0 years	5.1 years	4.7 years

The table below presents a summary of stock options activity during fiscal year 2017 and information on stock options outstanding at October 29, 2017.

Options	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Life	Aggregate Intrinsic Value
Outstanding at October 31, 2016	3,535,335	$ 7.59		
Granted	344,750	11.33		
Exercised	(401,750)	6.09		
Cancelled and forfeited	(133,100)	11.17		
Outstanding at October 29, 2017	3,345,235	$ 8.01	5.8 years	$ 7,108
Exercisable at October 29, 2017	2,142,094	$ 6.60	4.6 years	$ 6,661
Vested and expected to vest as of October 29, 2017	3,180,991	$ 7.87	5.7 years	$ 7,052

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The weighted-average grant date fair value of options granted during fiscal years 2017, 2016 and 2015 were $3.59, $4.51and $3.81, respectively. The total intrinsic value of options exercised during fiscal years 2017, 2016 and 2015 was $1.9 million, $3.5 million and $2.0 million, respectively.

We received cash from option exercises of $2.4 million, $3.1 million and $2.2 million in fiscal years 2017, 2016 and 2015, respectively. As of October 29, 2017, the total unrecognized compensation cost of unvested option awards was approximately $2.8 million. That cost is expected to be recognized over a weighted-average amortization period of 2.0 years.

Restricted Stock

We periodically grant restricted stock awards, the restrictions on which typically lapse over a service period of one-to-four years. The fair value of the awards are determined and fixed on the grant date based on our stock price. The weighted-average grant date fair values of restricted stock awards issued during fiscal years 2017, 2016 and 2015 were $10.94, $12.13 and $8.28, respectively. The total fair value of awards for which restrictions lapsed was $1.2 million, $1.7 million and $1.4 million during fiscal years 2017, 2016 and 2015, respectively. As of October 29, 2017, the total compensation cost for restricted stock awards not yet recognized was approximately $2.6 million. That cost is expected to be recognized over a weighted-average amortization period of 2.9 years.

A summary of restricted stock award activity during fiscal year 2017 and the status of our outstanding restricted stock awards as of October 29, 2017, is presented below:

Restricted Stock	Shares	Weighted-Average Fair Value at Grant Date
Outstanding at October 31, 2016	162,375	$ 9.61
Granted	317,750	10.94
Vested	(126,869)	9.78
Cancelled	(14,075)	10.89
Outstanding at October 29, 2017	339,181	$ 10.74
Vested and expected to vest as of October 29, 2017	302,898	$ 10.75

Employee Stock Purchase Plan

Our Employee Stock Purchase Plan (“ESPP”) permits employees to purchase Photronics, Inc. common shares at 85% of the lower of the closing market price at the commencement or ending date of the Plan year (which is approximately one year). We recognize the ESPP expense during that same period. As of October 29, 2017, the maximum number of shares of common stock approved by our shareholders to be purchased under the ESPP was 1.5 million shares; approximately 1.4 million shares had been issued through October 29, 2017, and approximately 54,000 shares are subject to outstanding subscriptions. As of October 29, 2017, the total compensation cost related to the ESPP not yet recognized was $0.1 million, which is expected to be recognized in fiscal 2018.

NOTE 9- EMPLOYEE RETIREMENT PLANS

We maintain a 401(k) Savings and Profit Sharing Plan (“401(k) Plan”) which covers all full and certain part time U.S. employees who have completed three months of service and are 18 years of age or older. Under the terms of the 401(k) Plan, employees may contribute up to 50% of their salary, subject to certain maximum amounts, which will be matched by the Company at 50% of the employee’s contributions that are not in excess of 4% of the employee’s compensation. Employee and employer contributions vest immediately upon contribution. The total employer contributions for all of our defined contribution plans were $0.6 million, $0.6 million and $0.7 million in fiscal years

2017, 2016, and 2015, respectively.

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NOTE 10 - INCOME TAXES

Income before the income tax provisions consists of the following:

	Year Ended October 29 2017	October 30, 2016	November 1, 2015
United States	$(11,544)	$ 6,270	$ 6,646
Foreign	38,109	54,204	63,394
	$26,565	$ 60,474	$ 70,040

The income tax provisions consist of the following:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Current:			
Federal	$173	$ 492	$ 160
State	(4)	(2)	(109)
Foreign	3,474	8,115	9,729
Deferred:			
Federal	-	-	-
State	15	10	7
Foreign	1,618	(3,817)	3,394
Total	$5,276	$ 4,798	$ 13,181

The income tax provisions differ from the amount computed by applying the statutory U.S. federal income tax rate to income before income taxes as a result of the following:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
U.S. federal income tax at statutory rate	$9,298	$ 21,166	$ 24,514
Changes in valuation allowances	(3,632)	(9,516)	(11,471)
Distributions from foreign subsidiaries	6,471	3,438	448
Foreign tax rate differentials	(5,230)	(9,620)	(4,356)
Tax credits	(1,925)	(944)	(2,729)
Uncertain tax positions, including reserves, settlements and resolutions	(932)	134	(175)
Income tax holiday	(743)	(507)	(869)
Employee stock compensation	512	452	634
Tax on foreign subsidiary earnings	1,712	225	6,589
Other, net	(255)	(30)	596
	$5,276	$ 4,798	$ 13,181

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The effective tax rates differ from the U.S. statutory rate of 35% in fiscal years 2017, 2016 and 2015 primarily due to earnings being taxed at lower statutory rates in foreign jurisdictions, changes in deferred tax asset valuation allowances, including the reversals noted below, together with the benefit of various investment credits in a foreign jurisdiction. In addition, the lower rate in fiscal year 2016 was partially driven by a benefit that resulted from the reversal of a previously recorded undistributed earnings tax liability in a foreign jurisdiction for which we are no longer liable. Two five-year tax holidays in Taiwan, one that expired in 2017 and the other that expires in 2019, reduced foreign taxes by $0.7 million, $0.5 million and $0.2 million in fiscal years 2017, 2016 and 2015, respectively. These tax holidays had no per share effect on our financial results of fiscal years 2017, 2016 and 2015.

The net deferred income tax assets consist of the following:

	As of	
	October 29, 2017	October 30, 2016
Deferred income tax assets:		
Net operating losses	$40,942	$ 46,158
Reserves not currently deductible	4,196	5,904
Alternative minimum tax credits	3,946	3,772
Tax credit carryforwards	10,037	8,814
Share-based compensation	2,335	1,972
Other	1,503	1,719
	62,959	68,339
Valuation allowances	(25,590)	(29,315)
	37,369	39,024
Deferred income tax liabilities:		
Undistributed earnings of foreign subsidiaries	(4,335)	(3,962)
Property, plant and equipment	(19,280)	(19,977)
Other	(322)	(254)
	(23,937)	(24,193)
Net deferred income tax assets	$13,432	$ 14,831
Reported as:		
Deferred income tax assets	$15,481	$ 16,322
Deferred income tax liabilities	(2,049)	(1,491)
	$13,432	$ 14,831

We have established a valuation allowance for a portion of our deferred tax assets because we believe, based on the weight of all available evidence, that it is more likely than not that a portion of our net operating loss carryforwards will expire prior to utilization. During fiscal years 2016 and 2015, we determined that sufficient positive evidence existed in certain foreign jurisdictions that it was more likely than not that additional deferred tax assets were realizable and, therefore, we reduced the valuation allowance by $4.3 million and $1.5 million, respectively. In addition, the valuation allowance decreased in fiscal years 2017, 2016 and 2015 as a result of loss utilizations and deferred tax liability changes of $3.7 million, $5.2 million and $9.3 million, respectively.

As of October 29, 2017, we have not provided deferred taxes on $170.6 million of undistributed earnings of non-U.S. subsidiaries, as it is our policy to indefinitely reinvest these earnings in non-U.S. operations. During fiscal year 2017, the permanently invested assertion was partially changed due to changes in circumstances within one of our non-U.S. subsidiary entities, and a U.S. tax liability was recognized for the related undistributed earnings. Should we elect in the future to repatriate the remaining foreign earnings deemed to be indefinitely reinvested, we may incur additional income tax expense on those foreign earnings, the amount of which is not practicable to compute.

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The following tables present our available operating loss and credit carryforwards at October 29, 2017, and their related expiration periods:

Operating Loss Carryforwards	Amount	Expiration Periods
Federal	$86,358	2025-2033
State	214,532	2018-2037
Foreign	15,414	2019-2023

Tax Credit Carryforwards	Amount	Expiration Period
Federal research and development	$5,580	2019-2037
Federal alternative minimum	3,946	Indefinite
State	5,829	2018-2031
Foreign	667	2022

A reconciliation of the beginning and ending amounts of unrecognized tax benefits, excluding interest and penalties, is as follows:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Balance at beginning of year	$4,606	$ 4,029	$ 4,993
Additions (reductions) for tax positions in prior years	207	744	(212)
Additions based on current year tax positions	323	268	318
Settlements	(922)	(378)	(720)
Lapses of statutes of limitations	(830)	(57)	(350)
Balance at end of year	$3,384	$ 4,606	$ 4,029

As of October 29, 2017, October 30, 2016 and November 1, 2015, the balance of unrecognized tax benefits includes $3.4 million, $4.6 million and $4.1 million recorded in other liabilities in the consolidated balance sheets that, if recognized, would impact the effective tax rate. Included in these amounts in each of fiscal years 2017, 2016 and 2015 were $0.1 million of interest and penalties. We include any applicable interest and penalties related to uncertain tax positions in our income tax provision. The amounts reflected in the table above for the fiscal years 2017, 2016 and 2015 include settlements of non-U.S. audits.

Although the timing of the expirations of statutes of limitations may be uncertain, as they can be dependent upon the settlement of tax audits, the Company believes that it is reasonably possible that up to $1.4 million of its uncertain tax positions (including accrued interest and penalties, and net of tax benefits) may be resolved over the next twelve months. Resolution of these uncertain tax positions may result from either or both of the lapses of statutes of limitations and tax settlements. The Company is no longer subject to tax authority examinations in the U.S., major

foreign, or state tax jurisdictions for years prior to fiscal year 2013.

Income tax payments were $9.3 million, $11.4 million and $4.9 million in fiscal years 2017, 2016 and 2015, respectively. Cash received as refunds of income taxes paid in prior years amounted to $0.1 million, $0.2 million and $0.1 million in fiscal years 2017, 2016 and 2015, respectively.

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Currently, Congress is considering various U.S. corporate tax reform bills, which if enacted could have a material impact on various components of the income taxes including but not limited to, valuation allowances, deferred tax assets and liabilities. If the proposed bills are signed into law we expect a reduction in the recorded deferred tax liability related to foreign earnings and an offsetting reduction in deferred tax assets related to U.S. net operating losses. At this time it is not practical to calculate the potential dollar amount of these potential income tax law changes. The Company will continue to evaluate the potential implications as more information becomes available and the changes are enacted.

NOTE 11 - EARNINGS PER SHARE

The calculation of basic and diluted earnings per share is presented as follows:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Net income attributable to Photronics, Inc. shareholders	$13,130	$ 46,200	$ 44,625
Effect of dilutive securities:			
Interest expense on convertible notes, net of related tax effects	-	2,938	4,363
Earnings for diluted earnings per share	$13,130	$ 49,138	$ 48,988
Weighted-average common shares computations:			
Weighted-average common shares used for basic earnings per share	68,436	67,539	66,331
Effect of dilutive securities:			
Share-based payment awards	852	974	967
Convertible notes	-	7,841	11,085
Dilutive common shares	852	8,815	12,052
Weighted-average common shares used for diluted earnings per share	69,288	76,354	78,383
Basic earnings per share	$0.19	$ 0.68	$ 0.67
Diluted earnings per share	$0.19	$ 0.64	$ 0.63

The table below shows the outstanding weighted-average share-based payment awards that were excluded from the calculation of diluted earnings per share because their exercise price exceeded the average market value of the common shares for the period or, under application of the treasury stock method, they were otherwise determined to be antidilutive. The table also shows convertible notes that, if converted, would have been antidilutive.

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Convertible notes	5,542	-	-
Share based payment awards	1,308	1,635	1,641
Total potentially dilutive shares excluded	6,850	1,635	1,641

NOTE 12 - COMMITMENTS AND CONTINGENCIES

At October 29, 2017, we had outstanding purchase commitments of $168 million, which included $162 million related to capital expenditures, and had recorded liabilities for the purchase of equipment of $3 million. See Notes 7 and 19, respectively, for information on our operating lease commitments and our plans to construct two facilities in China.

We are subject to various claims that arise in the ordinary course of business. We believe such claims, individually and in the aggregate, will not have a material effect on our consolidated financial statements.

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NOTE 13 - GEOGRAPHIC AND SIGNIFICANT CUSTOMER INFORMATION

We operate as a single operating segment as a manufacturer of photomasks, which are high precision quartz plates containing microscopic images of electronic circuits for use in the fabrication of IC's and FPDs. Geographic revenues (shown below) are based primarily on where our manufacturing facility is located.

Our 2017, 2016 and 2015 revenue by geographic area and by IC and FPD products, and long-lived assets by geographic area were as follows:

	Year Ended October 29, 2017	October 30, 2016	November 1, 2015
Net revenue			
Taiwan	$187,818	$ 193,216	$ 205,141
Korea	122,165	141,017	147,921
United States	102,040	113,670	132,792
Europe	36,081	33,384	35,792
All other Asia	2,574	2,169	2,560
	$450,678	$ 483,456	$ 524,206
IC	$350,260	$ 364,531	$ 420,833
FPD	100,418	118,925	103,373
	$450,678	$ 483,456	$ 524,206

	As of October 29, 2017	October 30, 2016	November 1, 2015
Long-lived assets			
Taiwan	$186,192	$ 176,644	$ 185,087
United States	180,095	173,658	184,282
Korea	147,265	146,515	167,618
Europe	13,372	9,617	10,287
All other Asia	8,273	-	10
	$535,197	$ 506,434	$ 547,284

One customer accounted for 16%, 19% and 18% of our revenue in fiscal years 2017, 2016 and 2015, respectively, and another customer accounted for 16%, 17%, and 15% of our revenue in fiscal years 2017, 2016 and 2015, respectively.

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NOTE 14 - CHANGES IN ACCUMULATED OTHER COMPREHENSIVE INCOME BY COMPONENT

The following tables set forth the changes in our accumulated other comprehensive income by component (net of tax of $0) for the years ended October 29, 2017 and October 30, 2016:

	Year Ended October 29, 2017			
	Foreign Currency Translation Adjustments	Amortization of Cash Flow Hedge	Other	Total
Balance at October 31, 2016	$(6,567)	$ (177)	$(927)	$(7,671)
Other comprehensive income before reclassifications	19,799	-	478	20,277
Amounts reclassified from other accumulated comprehensive income	-	129	-	129
Net current period other comprehensive income	19,799	129	478	20,406
Less: other comprehensive income attributable to noncontrolling interests	(5,605)	-	(239)	(5,844)
Balance at October 29, 2017	$7,627	$ (48)	$(688)	$6,891

	Year Ended October 30, 2016			
	Foreign Currency Translation Adjustments	Amortization of Cash Flow Hedge	Other	Total
Balance at November 1, 2015	$(9,634)	$ (306)	$(633)	$(10,573)
Other comprehensive income (loss) before reclassifications	6,334	-	(589)	5,745
Amounts reclassified from other accumulated comprehensive income	-	129	-	129
Net current period other comprehensive income (loss)	6,334	129	(589)	5,874
Less: other comprehensive (income) loss attributable to noncontrolling interests	(3,267)	-	295	(2,972)
Balance at October 30, 2016	$(6,567)	$ (177)	$(927)	$(7,671)

Amortization of the cash flow hedge is included in cost of goods sold in the consolidated statements of income in all periods presented.

NOTE 15 – CONCENTRATIONS OF CREDIT RISK

Financial instruments that potentially subject us to credit risk principally consist of trade accounts receivables and short-term cash investments. We sell our products primarily to semiconductor and FPD manufacturers in Asia, North America, and Europe. We believe that the concentration of credit risk in our trade receivables is substantially mitigated by our ongoing credit evaluation process and relatively short collection terms. We do not generally require collateral from customers. We establish an allowance for doubtful accounts based upon factors surrounding the credit risk of specific customers, historical trends and other information.

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Our cash and cash equivalents are deposited in several financial institutions, including institutions located within all of the countries in which we manufacture photomasks. Portions of deposits in some of these institutions may exceed the amount of insurance available for such deposits at these institutions. As these deposits are generally redeemable upon demand and are held by high quality, reputable institutions, we consider them to bear minimal credit risk. We further mitigate credit risks related to our cash and cash equivalents by spreading such risk among a number of institutions.

NOTE 16 - RELATED PARTY TRANSACTIONS

Our executive chairman of the board of directors is also a director of an entity that provided secure managed information technology services to Photronics in fiscal years 2016 and 2015. Another member of our board of directors was the chief executive officer and chairman of the board of this entity. We had contracted with this entity since 2002 for services it provided to all of our facilities. In fiscal years 2016 and 2015, we incurred expenses for services provided by this entity of $0.2 million and $1.0 million, respectively.

An officer of one of our foreign subsidiaries is related to an individual in a position of authority at one of our largest customers. We recorded revenue from this customer of $73.6 million, $80.5 million, and $77.8 million in fiscal years 2017, 2016 and 2015, respectively. At October 29, 2017 and October 30, 2016, we had accounts receivable of $24.3 million and $23.2 million, respectively, from this customer.

In July 2016, we entered into a contract for information technology services with a parent entity for which a member of our board of directors serves as the executive chairman of the board and director of a wholly owned subsidiary of that entity. During fiscal years 2017 and 2016, we incurred expenses of $0.5 million and $0.3 million, respectively with the parent entity, and had payables outstanding to the parent entity of $0.2 million at October 30, 2016.

We purchase photomask blanks from an entity of which a former officer of ours is a significant shareholder. The Company purchased $4.5 million of photomask blanks from this entity during the period in 2017 when the former officer was employed by us, and $16.3 million and $20.2 million in 2016 and 2015, respectively, for which the amount owed to this entity was $2.7 million at October 30, 2016 (the last reported date at which this entity was a related party to Photronics).

We believe that the terms of our transactions with the related parties described above were negotiated at arm’s length and were no less favorable to us than terms we could have obtained from unrelated third parties. See Note 4 for additional related party transactions.

NOTE 17 - FAIR VALUE MEASUREMENTS

The accounting framework for determining fair value includes a hierarchy for ranking the quality and reliability of the information used to measure fair value, which enables the reader of the financial statements to assess the inputs used to develop those measurements. The fair value hierarchy consists of three tiers as follows: Level 1, defined as quoted market prices (unadjusted) in active markets for identical securities; Level 2, defined as inputs other than Level 1 that are observable, either directly or indirectly; and Level 3, defined as unobservable inputs that are not corroborated by market data.

We did not have any assets or liabilities measured at fair value, on a recurring or a nonrecurring basis, at October 29, 2017 or October 30, 2016.

Fair Value of Other Financial Instruments

The fair values of our cash and cash equivalents (Level 1 measurements), accounts receivable, accounts payable, and certain other current assets and current liabilities (Level 2 measurements) approximate their carrying value due to their

short-term maturities. The fair value of our convertible senior notes is a Level 2 measurement, as it was determined using inputs that were either observable market data or could be derived from or corroborated with observable market data. These inputs included our stock price and interest rates offered on debt issued by entities with credit ratings similar to ours.

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The table below presents the fair and carrying values of our convertible senior notes at October 29, 2017 and October 30, 2016.

	October 29, 2017		October 30, 2016	
	Fair Value	Carrying Value	Fair Value	Carrying Value
3.25% convertible senior notes due 2019	$67,396	$ 57,337	$68,230	$ 57,221

NOTE 18 – GAINS ON SALE OF INVESTMENTS

We had a minority interest in a foreign entity. In fiscal year 2016, we sold this investment and recognized a gain of $8.8 million. In addition, as discussed in Note 4, we sold our investment in the MP Mask joint venture in fiscal year 2016.

NOTE 19 – EXPANSION INTO CHINA

Expansion of IC Manufacturing into China

In August 2016, Photronics Singapore Pte, Ltd., a wholly owned subsidiary, signed an investment agreement with the Administrative Committee of Xiamen Torch Hi-Tech Industrial Development Zone (Xiamen Torch) to establish an IC manufacturing facility in Xiamen, China. Under the terms of the agreement, we will build and operate an IC facility to engage in research and development, manufacture and sale of photomasks, in return for which Xiamen Torch will provide certain investment incentives and support. This expansion is also substantially supported by customer commitments for its output. The total investment per the agreement is $160 million to be funded over the next five years in cash, transferred equipment and potential local borrowings. Construction began in 2017 and production is anticipated to start in early 2019.

In the third quarter of fiscal 2017, we agreed to create a joint venture with DNP to encompass the Xiamen project. Under the agreement, our wholly-owned Singapore subsidiary will own 50.01% of the joint venture, which will be named Photronics DNP Mask Corporation Xiamen (PDMCX), and a subsidiary of DNP will own the remaining 49.99%. The financial results of the joint venture will be included in Photronics' consolidated financial statements.

Expansion of FPD Manufacturing into China

In August 2017, we announced that Photronics UK, Ltd., a wholly-owned subsidiary, signed an investment agreement with Hefei State Hi-tech Industry Development Zone to establish a manufacturing facility in Hefei, China. Under the terms of the agreement, through our subsidiary, we will invest a minimum of $160 million, a portion of which may be funded with local borrowings, to build and operate a research and development and manufacturing facility for high-end and mainstream FPD photomasks. Hefei State Hi-tech Industry Development Zone will provide certain investment incentives and support for this facility, which will have initial capability to produce up to G10.5 large area masks and AMOLED products. Construction began in late 2017 and production is anticipated to commence in early 2019.

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NOTE 20 - QUARTERLY RESULTS OF OPERATIONS (UNAUDITED)

The following table sets forth certain unaudited quarterly financial data:

	First	Second	Third	Fourth	Year
Fiscal 2017:					
Net sales	$109,831	$108,297	$111,579	$120,971	$450,678
Gross profit	22,999	20,157	21,717	26,442	91,315
Net income	4,510	1,484	4,799	10,496	21,289
Net income attributable to Photronics, Inc. shareholders	1,946	1,797	4,001	5,386	13,130
Earnings per share:					
Basic	$0.03	$0.03	$0.06	$0.08	$0.19
Diluted	$0.03	$0.03	$0.06	$0.08	$0.19
Fiscal 2016:					
	(a)	(b)		(c)	(a)(d)
Net sales	$129,956	$122,923	$123,209	$107,368	$483,456
Gross profit	35,436	31,287	31,450	20,533	118,706
Net income	23,501	14,153	11,453	6,569	55,676
Net income attributable to Photronics, Inc. shareholders	21,002	11,854	8,088	5,256	46,200
Earnings per share:					
Basic	$0.31	$0.18	$0.12	$0.08	$0.68
Diluted	$0.28	$0.16	$0.12	$0.08	$0.64

(a) Includes $8.8 million gain on sale of investment in a foreign entity.

(b) Includes a tax benefit in Taiwan of $1.8 million related to prior years.

(c) Includes a tax benefit in Taiwan of $3.0 million related to the recognition of prior period tax benefits and other tax positions no longer deemed necessary.

(d) Includes tax benefits in Taiwan of $4.8 million primarily related to the recognition of prior period tax benefits and other tax positions no longer deemed necessary.

NOTE 21 - RECENT ACCOUNTING PRONOUNCEMENTS

In January 2017, the Financial Accounting Standards Board (“FASB”) issued ASU 2017-04 “Simplifying the Test for Goodwill Impairment”, which eliminates Step 2 of the goodwill impairment test and requires entities to perform their annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount, and to recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit’s fair value. In addition, this ASU eliminates the requirements for any reporting unit with a zero or negative carrying amount to perform a qualitative assessment and, in the event the reporting unit fails the qualitative test, to perform Step 2 of the goodwill impairment test. ASU 2017-04 is effective for us in the first quarter of our fiscal year 2021, and will be applied on a prospective basis. The impact of this ASU will depend upon the nature of future acquisitions that we may make.

In January 2017, the FASB issued ASU 2017-01 “Clarifying the Definition of a Business”, with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. ASU 2017-01 is effective for Photronics in our first quarter of fiscal year 2019, and will be applied on a prospective basis. The impact of this ASU will depend upon the nature of future acquisitions or dispositions that we may make.

In November 2016, the FASB issued ASU 2016-18 “Restricted Cash”, which requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. This Update is effective for us in the first quarter of our fiscal year 2019, and will be applied on a retrospective transition basis. Early adoption is permitted, including adoption in an interim period as of the beginning of an annual reporting period for which interim or annual financial statements have not been issued or made available for issuance. We are currently evaluating the effect this ASU will have on our consolidated financial statements.

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In October 2016, the FASB issued ASU 2016-16 “Intra-Entity Transfers of Assets Other Than Inventory”, which eliminates the exception of recognizing, at the time of transfer, deferred income taxes for intra-entity asset transfers other than inventory. This Update is effective for us in the first quarter of our fiscal year 2019, and will be applied on a modified retrospective transition basis. Early adoption is permitted as of the beginning of an annual reporting period for which interim or annual financial statements have not been issued or made available for issuance. We are currently evaluating the effect this ASU will have on our consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15 “Classification of Certain Cash Receipts and Cash Payments”, which addresses eight specific cash flow issues with the objective of reducing diversity in practice. This Update is effective for us in the first quarter of our fiscal year 2019, and will be applied using a retrospective transition approach. We are currently evaluating the effect this ASU will have on our consolidated financial statements.

In June 2016, the FASB issued ASU 2016-13 “Measurement of Credit Losses”, the main objective of which is to provide more useful information about expected credit losses on financial instruments and other commitments of an entity to extend credit. In support of this objective, the ASU replaces the incurred loss impairment methodology found in current GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to measure expected credit losses. This ASU requires a cumulative-effect adjustment as of the beginning of the first reporting period in which the guidance is adopted. This Update is effective for us in the first quarter of our fiscal year 2021, with early adoption permitted beginning in the first quarter of fiscal year 2019. We are currently evaluating the effect this ASU will have on our consolidated financial statements.

In March 2016, the FASB issued ASU 2016 – 09 “Improvements to Employee Share-Based Payment Accounting”, which simplifies the accounting for share-based payment transactions including their income tax consequences, classification as either equity or liability awards, classification on the statement of cash flows, and other areas. The method of adoption varies with the different aspects of the Update. The Update is effective for us the first quarter of our fiscal year 2018. We do not expect this ASU to have a material impact on our consolidated financial statements.

In February 2016, the FASB issued ASU 2016 – 02 “Leases (Topic 842)”, which requires lessees to recognize right-of-use assets and corresponding liabilities for all leases with an initial term in excess of twelve months. The Update is to be adopted using a modified retrospective approach, which includes a number of practical expedients, that requires leases to be measured and recognized under the new guidance at the beginning of the earliest period presented. The ASU is effective for us in the first quarter of our fiscal year 2020, with early application permitted, and we are currently evaluating the effect this ASU will have on our consolidated financial statements.

In January 2016, the FASB issued ASU 2016-01 “Recognition and Measurement of Financial Assets and Financial Liabilities”, which provides targeted improvements to the recognition, measurement, presentation and disclosure of financial assets and financial liabilities. Specific accounting areas addressed include, equity investments, financial liabilities reported under the fair value option and valuation allowance assessment resulting from unrealized losses on available-for-sale securities. The ASU also changes certain presentation and disclosure requirements for financial instruments. The Update is to be applied by means of a cumulative effect adjustment to the balance sheet as of the beginning of the fiscal year of adoption. This ASU is effective for us in the first quarter of our fiscal year 2019. We are currently evaluating the effect this ASU will have on our consolidated financial statements.

In April 2015, the FASB issued ASU 2015-03 “Simplifying the Presentation of Debt Issuance Costs”, which requires debt issuance costs related to a recognized debt liability to be presented in the balance sheet as a direct deduction from that debt liability, consistent with the presentation of a debt discount. We adopted this ASU, and applied it on a retrospective basis, in the first quarter of our 2017 fiscal year. See Note 6 for the effects of adoption on our October 30, 2016, consolidated balance sheet.

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In May 2014, the FASB issued ASU 2014-09 “Revenue from Contracts with Customers”, which will supersede nearly all existing revenue recognition guidance under accounting principles generally accepted in the United States. The core principle of this ASU is that revenue should be recognized for the amount of consideration expected to be received for promised goods or services transferred to customers. This ASU also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments, and assets recognized for costs incurred to obtain or fulfill a contract. In August 2015, the FASB issued ASU 2015-14 which defers the effective date of ASU 2014-09 by one year and allows entities to early adopt, but no earlier than the original effective date. ASU 2014-09 will now be effective for us in the first quarter of our fiscal year 2019. This update allows for either full retrospective or modified retrospective adoption. In April 2016, the FASB issued ASU 2016-10 “Identifying Performance Obligations and Licensing” which amends guidance previously issued on these matters in ASU 2014-09. The effective date and transition requirements of ASU 2016-10 are the same as those for ASU 2014-09. We anticipate that the adoption of this ASU will result in the acceleration of revenue as, upon adoption of this Update, amounts in our work-in process inventory will be considered to represent promised goods transferred to our customers, requiring us to recognize consideration for those transferred goods in amounts we expect to be entitled to receive in exchange for them. However, we cannot currently quantify with reasonable certainty the effect this anticipated acceleration of revenue will have on our consolidated financial statements. We expect to adopt this Update using the modified retrospective approach.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We have established and currently maintain disclosure controls and procedures, as such term is defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), designed to provide reasonable assurance that information required to be disclosed in our reports filed under the Exchange Act, is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission’s rules and forms, and that such information is accumulated and communicated to management, including our chief executive officer and chief financial officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating disclosure controls and procedures, management recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Our management, under the supervision and with the participation of our chief executive officer and chief financial officer, evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the period covered by this report. Based upon that evaluation, our chief executive officer and chief financial officer concluded that our disclosure controls and procedures were effective at a reasonable assurance level as of the end of the period covered by this report.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting during the fourth fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Management’s Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles.

Management assessed the effectiveness of our internal control over financial reporting as of October 29, 2017, based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in its “Internal Control - Integrated Framework” (2013). Management, under the supervision and with the participation of our chief executive officer and chief financial officer, concluded that our internal control over financial reporting was effective as of October 29, 2017.

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The Company's independent registered public accounting firm, Deloitte & Touche LLP, has audited the effectiveness of the Company's internal control over financial reporting as of October 29, 2017, as stated in their report on page 29 of this Form 10-K.

December 20, 2017

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information as to Directors required by Items 401, 405 and 407(c)(3)(d)(4) and (d)(5) of Regulation S-K is set forth in our 2018 definitive Proxy Statement which will be filed with the Securities and Exchange Commission pursuant to Regulation 14A of the Exchange Act within 120 days after the end of the fiscal year covered by this Form 10-K under the caption "PROPOSAL 1 - ELECTION OF DIRECTORS," "SECTION 16(A) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE" and in the third paragraph under the caption "MEETINGS AND COMMITTEES OF THE BOARD," and is incorporated in this report by reference. The information as to Executive Officers is included in our 2018 definitive Proxy Statement under the caption "EXECUTIVE OFFICERS" and is incorporated in this report by reference.

We have adopted a code of ethics that applies to our principal executive officer, principal financial officer and principal accounting officer or chief financial officer. A copy of the code of ethics may be obtained, free of charge, by writing to the vice president, general counsel of Photronics, Inc. at 15 Secor Road, Brookfield, Connecticut 06804.

ITEM 11. EXECUTIVE COMPENSATION

The information required by Item 402 of Regulation S-K and paragraph (e)(4) and (e)(5) of Item 407 is set forth in our 2018 definitive Proxy Statement under the captions "EXECUTIVE COMPENSATION", "CERTAIN AGREEMENTS", "DIRECTORS' COMPENSATION", "COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION" and "COMPENSATION COMMITTEE REPORT ON EXECUTIVE COMPENSATION", respectively, and is incorporated in this report by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 201(d) of Regulation S-K is set forth in our 2018 definitive Proxy Statement under the caption "EQUITY COMPENSATION PLAN INFORMATION", and is incorporated in this report by reference. The information required by Item 403 of Regulation S-K is set forth in our 2018 definitive Proxy Statement under the caption "OWNERSHIP OF COMMON STOCK BY DIRECTORS, OFFICERS AND CERTAIN BENEFICIAL OWNERS", and is incorporated in this report by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by Items 404 and Item 407(a) of Regulation S-K is set forth in our 2018 definitive Proxy Statement under the captions "MEETINGS AND COMMITTEES OF THE BOARD" and "CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS", respectively, and is incorporated in this report by reference.

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ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by Item 9(e) of Rule 14a-101 of the Exchange Act is set forth in our 2018 definitive Proxy Statement under the captions “Fees Paid to the Independent Registered Public Accounting Firm” and “AUDIT COMMITTEE REPORT”, and is incorporated in this report by reference.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

The following documents are filed as part of this report:

		Page No.
1.	Financial Statements: See “INDEX TO CONSOLIDATED FINANCIAL STATEMENTS” in Part II, Item 8 of this Form 10-K.	28
2.	Financial Statement Schedule:	
	Report of Independent Registered Public Accounting Firm on financial statement schedule	59
	Schedule II - Valuation and Qualifying Accounts for the years ended October 29, 2017, October 30, 2016 and November 1, 2015	59
	All other schedules are omitted because they are not applicable.	
3.	Exhibits	59

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM ON FINANCIAL STATEMENT SCHEDULE

Board of Directors and Shareholders
Photronics, Inc.
Brookfield, Connecticut

We have audited the consolidated financial statements of Photronics, Inc. and subsidiaries (the “Company”) as of October 29, 2017 and October 30, 2016 and for each of the fiscal years ended October 29, 2017, October 30, 2016, and November 1, 2015, and have issued our report thereon dated December 20, 2017, which contained an unqualified opinion on those consolidated financial statements. The financial statement schedule in Item 15 has been subjected to audit procedures performed in conjunction with the audit of the Company’s consolidated financial statements. The financial statement schedule is the responsibility of the Company’s management. Our audit procedures included determining whether the financial statement schedule reconciles to the consolidated financial statements or the underlying accounting and other records, as applicable, and performing procedures to test the completeness and accuracy of the information presented in the financial statement schedule. In our opinion, such schedule is fairly stated, in all material respects, in relation to the consolidated financial statements as a whole.

/s/ Deloitte & Touche LLP
Hartford, Connecticut
December 20, 2017

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Schedule II

Valuation and Qualifying Accounts
for the Years Ended October 29, 2017, October 30, 2016
and November 1, 2015
(in $ thousands)

	Balance at Beginning of Year	Charged to Costs and Expenses		Deductions		Balance at End of Year
Allowance for Doubtful Accounts						
Year-ended October 29, 2017	3,901	(1,600)	(b)	18	(a)	2,319
Year ended October 30, 2016	3,301	642		(42)	(a)	3,901
Year ended November 1, 2015	3,078	730		(507)	(a)	3,301
Deferred Tax Asset Valuation Allowance						
Year-ended October 29, 2017	29,315	-		(3,725)	(c)	25,590
Year ended October 30, 2016	38,763	(4,262)	(b)	(5,186)	(c)	29,315
Year ended November 1, 2015	49,548	(2,364)	(b)	(8,421)	(c)	38,763

(a) Uncollectible accounts written off, net, and impact of foreign currency translation.
(b) Reversal of valuation allowance.
(c) Increase in deferred tax liability and utilization of net operating losses.

EXHIBITS INDEX

Exhibit Number	Description
3.1	Certificate of Incorporation as amended July 9, 1986, April 9, 1990, March 16, 1995, November 13, 1997, April 15, 2002 and June 20, 2005 (incorporated by reference to Exhibit 3.1 to the Company's Annual Report on Form 10-K filed January 3, 2014).
3.2	Amended and Restated By-laws of the Company dated as of September 7, 2016 (incorporated by reference to the Company's Current Report on Form 8-K filed on September 13, 2016).
4.4	Indenture dated January 22, 2015, by and between the Company and the Bank of New York Mellon Trust Company, N.A., as trustee (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed on January 28, 2015).
10.1	The Company's 1992 Employee Stock Purchase Plan. *
10.2	Amendment to the Employee Stock Purchase Plan as of March 24, 2004 (incorporated by reference to Exhibit 10.2 to the Company's Annual Report on Form 10-K filed on January 6, 2017).+
10.3	Amendment to the Employee Stock Purchase Plan as of April 8, 2010 (incorporated by reference to Exhibit 10.4 to the Company's Annual Report on Form 10-K filed on January 7, 2016).+

10.4	Amendment to the Employee Stock Purchase Plan as of March 28, 2012 (incorporated by reference to Exhibit 10.9 of the Company's Quarterly Report on Form 10-Q filed September 5, 2012)+
10.5	2016 Equity Incentive Compensation Plan (incorporated by reference to the Company's Definitive Proxy Statement filed on February 26, 2016). +
10.6	The Company's 2007 Long-Term Equity Incentive Plan (incorporated by reference to the Company's Definitive Proxy Statement filed on March 3, 2014). +
10.7	Amendment to the 2007 Long-Term Equity Incentive Plan as of April 8, 2010 (incorporated by reference to Exhibit 10.7 to the Company's Annual Report on Form 10-K Field on January 7, 2016).+

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10.8	Amendment to the 2007 Long Term Equity Incentive Plan as of April 11, 2014 (incorporated by reference to Exhibit 10.8 of the Company's Annual Report on Form 10-K filed January 6, 2015).+
10.9	2011 Executive Incentive Compensation Plan effective as of November 1, 2010 (incorporated by reference to Exhibit 10.9 of the Company's Annual Report on Form 10-K filed January 6, 2015).+
10.10	Executive Employment Agreement between the Company and Constantine Macricostas dated May 4, 2015 (incorporated by reference to Exhibit 10.31 to the Company's Quarterly Report on Form 10-Q filed on September 9, 2015). +
10.11	Executive Employment Agreement between the Company and Sean T. Smith dated February 20, 2003 (incorporated by reference to Exhibit 10.12 of the Company's Annual Report on Form 10-K filed January 6, 2015). +
10.12	Limited Liability Company Operating Agreement of MP Mask Technology Center, LLC (MP Mask) between Micron Technology, Inc. ("Micron") and Photronics, Inc. ("Photronics") dated May 5, 2006 (incorporated by reference to Exhibit 10.14 to the Company's Annual Report on Form 10-K filed on January 13, 2012).#
10.13	Contribution and Units Purchase Agreement between Micron, Photronics and MP Mask dated May 5, 2006 (incorporated by reference to Exhibit 10.15 to the Company's Annual Report on Form 10-K filed on January 13, 2012). #
10.14	Technology License Agreement among Micron, Photronics and MP Mask dated May 5, 2006 (incorporated by reference to Exhibit 10.16 to the Company's Annual Report on Form 10-K filed on January 13, 2012).#
10.15	Photronics to Micron Supply Agreement between Micron and Photronics dated May 5, 2006 (incorporated by reference to Exhibit 10.17 to the Company's Annual Report on Form 10-K filed on January 13, 2012).#
10.16	MP Mask to Photronics Supply Agreement between MP Mask and Photronics dated May 5, 2006 (incorporated by reference to Exhibit 10.18 to the Company's Annual Report on Form 10-K filed on January 13, 2012).#
10.17	Special Warranty Deed dated as of February 29, 2012 (incorporated by reference to Exhibit 99.2 to the Company's Current Report on Form 8-K filed on March 6, 2012).
10.18	Outsource Supply Agreement between Micron and Photronics dated March 24, 2015 (incorporated by reference to Exhibit 10.18 to the Company's Quarterly Report on Form 10-Q filed on June 4, 2015).#
10.19	Bridge License Agreement between Micron and Photronics dated March 24, 2015 (incorporated by reference to Exhibit 10.16 to the Company's Quarterly Report on Form 10-Q filed on June 4, 2015).#
10.20	Joint Venture Framework Agreement dated November 20, 2013, between the Company and Dai Nippon Printing Co., Ltd (incorporated by reference to Exhibit 10.19 of the Company's Annual Report on Form 10-K/A filed July 8, 2015). #
10.21	Joint Venture Operating Agreement dated November 20, 2013, between the Company and Dai Nippon Printing Co., Ltd. (incorporated by reference to Exhibit 10.20 of the Company's Annual Report on Form 10-K/A filed July 8, 2015).#
10.22	Outsourcing Agreement dated November 20, 2013, among the Company, Dai Nippon Printing Co., Ltd and Photronics Semiconductor Mask Corporation (incorporated by reference to Exhibit 10.21 of the Company's

Annual Report on Form 10-K/A filed July 8, 2015).#

10.23 License Agreement dated November 20, 2013, between the Company and Photronics Semiconductor Mask Corporation (incorporated by reference to Exhibit 10.22 of the Company's Annual Report on Form 10-K/A filed July 8, 2015).#

10.24 License Agreement dated November 20, 2013, between Dai Nippon Printing Co., Ltd and Photronics Semiconductor Mask Corporation (incorporated by reference to Exhibit 10.23 of the Company's Annual Report on Form 10-K/A filed July 8, 2015). #

10.25 Margin Agreement dated November 20, 2013, among the Company, Dai Nippon Printing Co., Ltd and Photronics Semiconductor Mask Corporation (incorporated by reference to Exhibit 10.24 of the Company's Annual Report on Form 10-K/A filed July 8, 2015).#

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10.26	Merger Agreement dated January 16, 2014, between Photronics Semiconductor Mask Corporation and DNP Photomask Technology Taiwan Co., Ltd. (incorporated by reference to Exhibit 10.25 of the Company's Annual Report on Form 10-K/A filed July 8, 2015).#
10.27	Executive Employment Agreement between the Company and Soo Hong Jeong dated May 31, 2011 (incorporated by reference to Exhibit 10.27 of the Company's Annual Report on Form 10-K filed on January 6, 2017). +
10.28	Executive Employment Agreement between the Company and Christopher J. Progler, Vice President, Chief Technology Officer dated September 10, 2007 (incorporated by reference to Exhibit 10.24 to the Company's Annual Report on Form 10-K filed on January 11, 2008).+
10.29	Executive Employment Agreement between the Company and Peter S. Kirlin dated May 4, 2015 (incorporated by reference to Exhibit 10.28 of the Company's Quarterly Report on Form 10-Q filed on September 9, 2015).+
10.30	Executive Employment Agreement between the Company and Richelle E. Burr dated May 21, 2010 (incorporated by reference to Exhibit 10.30 of the Company's Annual Report on Form 10-K filed on January 7, 2016).+
10.31	Executive Employment Agreement between the Company and John P. Jordan dated September 5, 2017* +
10.32	Form of Amendment to Executive Employment Agreement dated March 16, 2012 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on March 16, 2012).+
10.33	Third Amended and Restated Credit Agreement Dated as of December 5, 2013 (incorporated by reference to Exhibit 10.24 to the Company's Annual Report on Form 10-K filed on January 3, 2014).
10.34	Amendment No. 1 Dated as of August 22, 2014 to the Third Amended and Restated Credit Agreement Dated as of December 5, 2013 (incorporated by reference to Exhibit 10.32 of the Company's Annual Report on Form 10-K filed on January 6, 2015).
10.35	Amendment No. 2 to the Third Amended and Restated Credit Agreement Dated May 15, 2017 (incorporated by reference to Exhibit 10.30 of the Company's Quarterly Report on Form 10-Q filed on june 8, 2017).
10.36	Second Amended and Restated Security Agreement (incorporated by reference to Exhibit 10.33 of the Company's Annual Report on Form 10-K filed on January 6, 2015).
10.37	Investment Agreement between Xiamen Torch Hi-Tech Industrial Development Zone Management Committee and Photronics Singapore Pte. Ltd. dated August 18, 2016 (incorporated by reference to Exhibit 10.35 to the Company's Quarterly Report on Form 10-Q filed on September 2, 2016)#.
10.38	Contribution Agreement dated May 16, 2017 among Dai Nippon Printing Co., Ltd. ("DNP), DNP Asia Pacific Pte. Ltd. ("DNP Asia Pacific"), Photronics, Inc. ("Photronics"), Photronics Sigapore Pte. Ltd., ("Photronics Sigapore"), and Xiamen American Japan Photronics Mask Co., Ltd. ("PDMCX") (incorporated by reference to Exhibit 10.26 to the Company's Quarterly Report on Form 10-Q/A filed on December 19, 2017).#
10.39	Joint Venture Operating Agreement dated May 16, 2017 among Photronics, Photronics Singapore, DNP and DNP Asia Pacific (incorporated by reference to Exhibit 10.27 to the Company's Quarterly Report on Form

	10-Q/A filed on December 19, 2017).#
10.40	Outsourcing Agreement dated May 16, 2017 among Photronics, DNP, Photronics DNP Photomask Corporation ("PDMC"), and PDMCX (incorporated by reference to Exhibit 10.28 to the Company's Quarterly Report on Form 10-Q/A filed on December 19, 2017).#
10.41	Amended and Restated License Agreement dated May 16, 2017 between DNP and PDMC (incorporated by reference to Exhibit 10.29 to the Company's Quarterly Report on Form 10-Q/A filed on December 19, 2017).#
10.42	Investment Cooperation Agreement between Hefei State Hi-tech Industry Development Zone and Photronics UK, Ltd. *#
21	List of Subsidiaries of the Company.*
23	Consent of Deloitte & Touche LLP.*
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.*
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.*
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

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+ Represents a management contract or compensatory plan or arrangement.

Portions of this exhibit have been omitted pursuant to a request for confidential treatment filed with the Securities and Exchange Commission.

* Represents an exhibit that is filed with this Annual Report on Form 10-K.

The Company will provide a copy of any exhibit upon receipt of a written request for the particular exhibit or exhibits desired. All requests should be addressed to the Company's general counsel at the address of the Company's principal executive offices.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

PHOTRONICS, INC.
(Registrant)

By /s/ JOHN P. JORDAN December 20, 2017
John P. Jordan
Senior Vice President
Chief Financial Officer
(Principal Accounting Officer/
Principal Financial Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By /s/ PETER S. KIRLIN December 20, 2017
Peter S. Kirlin
Chief Executive Officer
Director
(Principal Executive Officer)

By /s/ JOHN P. JORDAN December 20, 2017
John P. Jordan
Senior Vice President
Chief Financial Officer
(Principal Accounting Officer/
Principal Financial Officer)

By /s/ CONSTANTINE S. MACRICOSTAS December 20, 2017
Constantine S. Macricostas
Executive Chairman of the Board

By /s/ WALTER M. FIEDEROWICZ December 20, 2017
Walter M. Fiederowicz
Director

By /s/ JOSEPH A. FIORITA, JR. December 20, 2017
Joseph A. Fiorita, Jr.
Director

By /s/ LIANG-CHOO HSIA December 20, 2017
Liang-Choo Hsia
Director

By /s/ GEORGE MACRICOSTAS December 20, 2017
George Macricostas
Director

By /s/ MITCHELL G. TYSON December 20, 2017
Mitchell G. Tyson
Director