

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 September 27, 2019
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: 001-35451

MACOM Technology Solutions Holdings, Inc.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

27-0306875

(I.R.S. Employer Identification No.)

100 Chelmsford Street

Lowell, MA 01851

(Address of principal executive offices and zip code)

(978) 656-2500

(Registrant's telephone number, including area code)

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

Title of Each Class	Trading Symbol	Name of Each Exchange on Which Registered
Common Stock, par value \$0.001 per share	MTSI	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 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 every Interactive Data File required to be submitted 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 such files). Yes No

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

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes No

The aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of March 29, 2019, the last business day of the registrant's second fiscal quarter, was approximately \$762.2 million based on the closing price of the registrant's common stock as of such date as reported on the Nasdaq Global Select Market. For purposes of the foregoing calculations only, shares of common stock held by each executive officer and director of the registrant and their respective affiliates have been excluded, as such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of outstanding shares of the registrant's common stock, par value \$0.001 per share, as of November 21, 2019 was 66,161,045.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates certain information by reference from the registrant's definitive proxy statement for the 2020 Annual Meeting of Stockholders, which will be filed no later than 120 days after the close of the registrant's fiscal year ended September 27, 2019.

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CAUTIONARY STATEMENT

This Annual Report on Form 10-K ("Annual Report") contains forward-looking statements, including statements regarding our business outlook, strategy, plans, expectations, estimates and objectives for future operations, our future results of operations and our financial position. Forward-looking statements generally may be identified by terms such as "anticipates," "believes," "could," "continue," "estimates," "expects," "intends," "may," "plans," "potential," "predicts," "projects," "seeks," "should," "targets," "will," "would" or similar expressions or variations or the negatives of those terms.

Forward-looking statements are neither historical facts nor assurances about future performance. Instead, they are based only on our current beliefs, expectations and assumptions. Because forward-looking statements relate to the future, such statements involve inherent risks, changes and uncertainties that are difficult to predict and many of which are outside of our control. A number of important factors could cause actual results and outcomes to differ materially and adversely from those expressed or implied by our forward-looking statements. We urge you to consider the risks and uncertainties in "Item 1A - Risk Factors" and elsewhere in this Annual Report and the other documents filed by us with the Securities and Exchange Commission (the "SEC"). Except as required by law, we undertake no obligation to revise or update our forward-looking statements to reflect any event or circumstance that may arise after the date of this Annual Report.

In this document, the words "MACOM," "Company," "we," "our," "us," and similar terms refer only to MACOM Technology Solutions Holdings, Inc. and its consolidated subsidiaries, and not any other person or entity.

"MACOM," "M/A-COM," "M/A-COM Technology Solutions," "M/A-COM Tech," "Partners in RF & Microwave" and related logos are trademarks of MACOM Technology Solutions Holdings, Inc. All other brands and names listed are trademarks of their respective owners.

PART I

ITEM 1. BUSINESS

Overview

We design and manufacture semiconductor products for Data Center, Telecommunications ("Telecom") and Industrial and Defense ("I&D") applications. Headquartered in Lowell, Massachusetts, we have more than 65 years of application expertise, with silicon, gallium arsenide ("GaAs") and indium phosphide ("InP") fabrication, manufacturing, assembly and test, and operational facilities throughout North America, Europe and Asia. We design, develop and manufacture differentiated, high-value semiconductor products for customers who demand high performance, quality and reliability. We offer a broad portfolio of thousands of standard and custom devices, which include integrated circuits ("IC"), multi-chip modules ("MCM"), diodes, amplifiers, switches and switch limiters, passive and active components and complete subsystems, across dozens of product lines serving over 8,000 end customers in three primary markets. Our semiconductor products are electronic components that our customers incorporate into their larger electronic systems, such as wireless basestations, high speed optical networks, active antenna arrays, radar, medical systems and test and measurement. Our primary markets are: (1) Telecom, which includes carrier infrastructure like long-haul/metro, 5G and fiber-to-the-X ("FTTx")/ passive optical network ("PON"); (2) Data Centers, enabled by our broad portfolio of analog ICs and photonic components for high speed optical module customers; and (3) I&D, which includes military and commercial radar, radio frequency ("RF") jammers, electronic countermeasures, communication data links, satellite communications and multi-market applications, which include industrial, medical, test and measurement as well as scientific applications.

Many of our products have long life cycles ranging from five to ten years, and some of our products have been generating revenue for over twenty years. We continue to develop new products and technologies to improve our ability to serve our primary markets. Our growth strategy is focused on strengthening our customer relationships and capturing more design wins in order to increase our market share. As we grow our portfolio and technology base, we believe our customers will select more of our components for use in their systems.

Our manufacturing model consists of domestic semiconductor wafer fabrication capabilities coupled with our external foundry partners. This provides us with a competitive advantage and an attractive financial model by allowing us to utilize our variable cost structure while enabling us to adapt to changing market conditions and customer demands. We operate semiconductor fabrication facilities at our Lowell, Massachusetts headquarters and in Ann Arbor, Michigan. Our facilities are certified to the International Organization for Standardization ("ISO") 9001 international quality standard and ISO14001 environmental management standard. We manufacture compound semiconductors including GaAs and InP. In the I&D markets, a domestic fabrication facility may be a requirement to be a strategic supplier, and we believe our status as a "Trusted Foundry" offers us further competitive differentiation.

We also utilize external semiconductor foundries to supply us with additional capacity, lower costs and to provide us access to additional process technologies. The ability to utilize a broad array of internal proprietary process technologies and commercially available foundry technologies allows us to select the most appropriate technology to solve our customers' needs. We believe that this strategy provides us with dependable supply, control over quality, reduced capital investment requirements, faster time to market and additional outsourced capacity when needed. In addition, the experience base cultivated through the continued operation of our internal fabrication lines provides us with the expertise to better manage our external foundry suppliers.

Research and Development

Our research and development efforts are directed toward the rapid development of new and innovative products, process technologies and packaging techniques. The interaction of semiconductor process technology, circuit design technology and packaging technology defines the performance parameters and the customers' acceptance of our products. We believe some of our core competencies are the ability to model, design, test, integrate, package and manufacture differentiated solutions for our customers. We leverage this core competency to solve difficult and complex challenges that our customers face during their system design phases. We believe our integrated and customized solutions offer customers high performance, quality, reliability and faster time to market.

Circuit design and device modeling expertise. Our engineers are experts in the design of circuits capable of reliable, high-performance analog RF, microwave, millimeterwave and photonic signal conditioning. Our staff has decades of experience in solving complex design challenges in applications involving high frequency, high power and environmentally-rugged operating conditions.

Semiconductor process technology. We leverage our domestic semiconductor wafer fabrication capabilities and our foundry suppliers to offer customers the right process technology to meet their particular requirements. Depending on the requirements for the application, our semiconductor products may be designed using an internally developed or externally sourced process technology.

Packaging expertise. Our extensive packaging expertise enables us to model the interaction between the semiconductor and its package. Our engineers make adjustments in the design of both the semiconductor and the package, to take account of that interaction. We offer products in a variety of different package types for specific applications, including plastic over-molded, ceramic and laminate-based packaging.

We continue to invest in proprietary processes to enable us to develop and manufacture high-value solutions. For example, we have developed innovative, patented technologies such as heterolithic microwave integrated circuit ("HMIC"), which provides high integration, high power and low loss switching capabilities for our primary markets. This technology replaces mechanical switches for very high-power applications such as wireless basestations.

Our engineers' radar, optical, microwave and millimeterwave system-level design expertise allows us to offer differentiated solutions that leverage multiple process technologies and are integrated into a single, higher-level assembly, thereby delivering our customers enhanced functionality.

Our Markets & Products

Our core strategy is to develop and innovate high-performance products that address our customers' technical challenges in our primary markets: Telecom, Data Center and I&D. While sales in any or all of our primary markets may slow or decline from period to period, over the long-term we generally expect to benefit from our strength in these markets. We expect our revenue in the Telecom market to be driven by 5G, with continued upgrades and expansion of communications equipment to support mobile computing devices such as smartphones and tablets, increasing adoption of bandwidth rich services. We expect our revenue in the Data Center market to be driven by the adoption of cloud-based components and the migration to an application centric architecture, which we expect will drive adoption of higher speed, 100G and higher speed optical and photonic wireless links. We expect our revenue in the I&D market to be driven by the broad product portfolio we offer that services applications such as test and measurement, satellite communications, civil and military radar, industrial, scientific and medical applications. Growth in this market is subject to changes in governmental programs and budget funding, which is difficult to predict. We expect revenue in this market to be further supported by growth in applications for our multi-market catalog products.

Telecom. Growth in the Telecom market is driven by the proliferation of wireless and wired devices from smartphones and tablets to basestations, as well as the data rich applications and services they enable such as mobile Internet, cloud computing, video-on-demand, social media, global positioning functionality and location-based services. Growth in global next-generation Internet and Internet of Things ("IoT") applications drives demand for communications infrastructure equipment requiring amplifiers, filters, receivers, switches, synthesizers, transformers, upconverters and other components to expand and upgrade cellular backhaul, cellular infrastructure, wired broadband and fiber optic networks. Semiconductor products and solutions must continually deliver greater bandwidth and functionality as the demands of our customers and end users increase.

Our expertise in system-level architectures and advanced IC design capability allow us to offer network original equipment manufacturer ("OEM") customers highly-integrated solutions optimized for performance and cost. Our portfolio of opto-electronics products includes lasers, clock and data recovery, optical post amplifiers, laser and modulator drivers, transimpedance amplifiers, transmitter and receiver applications in 2.5/10/40/100 gigabits per second ("Gbps") long haul, metro, data center links and fiber-to-the-X ("FTTx") fiber optic network components that enable telecommunications carriers and data centers to cost-efficiently increase their network capacity by a factor of four to ten times over earlier generation solutions. We match our opto-electronic components to various lasers enabling our customers to buy more complete solutions for their opto-electronic systems. For optical communications applications, we utilize a proprietary combination of GaAs, InP and Silicon Germanium ("SiGe") technologies to obtain advantages in performance and size. For wired broadband applications, we offer OEM customers the opportunity to streamline their supply chain through our broad catalog of active components such as active splitters, amplifiers, multi-function ICs and switches, as well as passive components such as transformers, diplexers, filters, power dividers and combiners.

Data Center. The demand by Cloud Data Center providers for faster data delivery speeds at cost-effective prices is growing rapidly, where higher speeds are necessary to process the current growth in traffic. To solve these challenges, we leverage our broad optical and photonic portfolio of products to enable our customers to deliver optical transceivers that meet the requirements of today's Cloud Data Center deployments. By building a comprehensive portfolio of complementary products that enable our customers' optical transceiver applications, we offer high performing, cost-effective component solutions for next-generation networks.

We enable the market with a complete product portfolio of PAM-4 PHYs, TIAs, Modulator Drivers, Lasers, and Silicon Photonics, and, in some cases, individual component designs are optimized for use together as a chip-set.

Industrial & Defense. In the I&D market, military applications require advanced electronic systems, such as radar warning receivers, communications data links and tactical radios, unmanned aerial vehicles ("UAVs"), RF jammers, electronic countermeasures and smart munitions. Military applications are becoming more sophisticated, favoring higher performance semiconductor ICs based on GaAs and Gallium Nitride ("GaN") technologies due to their high power density, improved power efficiency and broadband capability.

We believe our in-depth knowledge of critical radar system requirements, integration expertise and track record of reliability make us a valued resource for our I&D customers faced with demanding application parameters. Further, we have been accredited by the United States Department of Defense with "Trusted Foundry" status, a designation conferred on microelectronics vendors exhibiting the highest levels of process integrity and protection, which we believe differentiates us as a trusted manufacturer of ICs for U.S. military and aerospace applications. For radar applications, we offer standard and custom amplifiers, discrete components, switch limiters, phase shifters and integrated modules for transmit and receive functions in air traffic control, marine, weather, and military radar applications. For military communications data link and tactical radio applications, we offer a family of active, passive and discrete products, such as

Monolithic Microwave Integrated Circuits ("MMICs"), control components, voltage-controlled oscillators ("VCOs"), transformers, power pallets, amplifiers and diodes. In some cases, we design parts specifically for these applications, while in others, our reputation for quality and our broad catalog allows these demanding customers to reduce the cost of their high-performance systems by designing in standard dual-use or commercial off-the-shelf parts that we have developed for other applications. We believe manufacturing many of these products in our Lowell, Massachusetts Trusted Foundry offers us a competitive advantage in the I&D market because of certain I&D customers' requirements for a domestic supply chain.

Furthermore, growth in the I&D business is driven by multi-market applications encompassing industrial, medical, test and measurement and scientific applications, where analog RF, microwave and millimeterwave semiconductor solutions are gaining prevalence. In addition, evolving medical technology has increased the need for high-performance MMICs and other semiconductor solutions in medical imaging and patient monitoring to provide enhanced analysis and functionality.

In the medical industry, our custom designed non-magnetic diode product line is a critical component for certain MRI applications. For sensing and test and measurement applications, we believe our patented HMIC process is ideal for high-performance, integrated bias networks and switches. Our catalog of general purpose GaAs ICs includes low noise amplifiers, switches and power amplifiers that address a wide range of applications such as industrial automation systems to test and measurement equipment.

To address our primary markets, we offer a broad range of standard and custom ICs and components. Our product catalog currently consists of thousands of products including the following key product platforms: amplifiers, ICs, diodes, switches and switch limiters, passive and active components and multi-chip modules. Many of our product platforms are leveraged across multiple markets and applications. For example, our application expertise with regard to power amplifier technology is leveraged across both scientific laboratory equipment applications and commercial and defense radar system applications. Our diode technology is used in switch filter banks of military tactical radios as well as medical imaging MRI systems. The table below presents the major product families and major applications in our primary markets.

PRIMARY MARKET	PRODUCT FAMILIES	PRIMARY MARKET	MAJOR PRODUCT FAMILIES	PRIMARY MARKET	MAJOR PRODUCT FAMILIES
Telecom	RF Power Products Diodes Phase Shifters Limiters Switches Control Products Switch LNAs PHY Embedded Processors Passives HDcctv Cable Devices Crosspoint Switches SDI Products Amplifiers Comb Generators Voltage Controlled Oscillators	Data Center	Lasers Modulator Drivers Clock and Data Recovery Optical Post Amplifiers PHY Embedded Processors Photonic Devices Optical Receivers Crosspoint Switches Silicon Photonic Integrated Devices	Industrial & Defense	RF Power Products Diodes Phase Shifters Limiters Switches Control Products Passives Amplifiers Comb Generators Voltage Controlled Oscillators

Sales and Marketing

We employ a global multi-channel sales strategy and support model intended to facilitate our customers' evaluations and selections of our products. We sell through our direct sales force, our application engineering staff, our global network of independent sales representatives, resellers and distributors. We have strategically positioned our direct sales and applications engineering staff in locations worldwide, augmented by independent sales representatives and distributors with additional domestic and foreign locations to offer responsive local support resources to our customers and to build long-term relationships. Our application engineers visit customers at their engineering and manufacturing facilities, aid them in understanding our capabilities and collaborate with them to deliver products that can optimize their system performance. Our global independent sales representatives and distributor network allow us to extend our sales capabilities to new customers in new geographies more cost effectively than using our direct sales force alone.

Our products are principally sold in North America, Asia and Europe, which is where we concentrate our direct sales force, application engineering staff, independent sales representatives and distributors. Sales to our distributors accounted for 33.3%, 29.0% and 19.3% of our revenue in fiscal years 2019, 2018 and 2017, respectively. Our agreements with sales representatives, resellers and distributors may provide for an initial term of one or more years with the opportunity for subsequent renewals or for an indefinite term, and also typically provide that either party may terminate the agreement for convenience with a minimum period of prior notice to the other party, usually between 30 and 90 days.

Our sales efforts are focused on the needs of our customers in our three primary markets rather than on particular product lines, facilitating product cross-selling across end markets, and within key accounts. Through our website, customers can inquire about our products, request samples and access our product selection guides, detailed product brochures and data sheets, application notes, suggested design block diagrams and test fixture information, technical articles and information regarding quality and reliability.

Customers

Our customer base is diversified and includes OEM customers, contract manufacturers, resellers and distributors. For fiscal years 2019 and 2018, no direct customer individually accounted for 10% or more of our revenue. For fiscal year 2017, one direct customer, Huawei Technologies Co., Ltd. ("Huawei") accounted for 10% of our revenue. In addition, our principal distributor, Richardson Electronics, an Arrow Electronics Company ("Richardson"), accounted for 16.1%, 12.5% and 10.5% of our revenue in fiscal years 2019, 2018 and 2017, respectively. Our top 25 direct customers accounted for an aggregate of 47.5%, 52.8% and 59.1% of our revenue in fiscal years 2019, 2018 and 2017, respectively.

Our orders from and sales to customers in the telecommunications infrastructure and networking markets may tend to be lower in our first fiscal quarter as compared to other quarters due to seasonal inventory management by large OEM and contract manufacturing customers.

Competition

The markets for our products are highly competitive and are characterized by continuously evolving customer requirements. We believe that the principal competitive factors in our markets include:

- the ability to timely design and deliver products and solutions that meet customers' performance, reliability and price requirements;
- the breadth and diversity of product offerings;
- the ability to provide a reliable supply of products in sufficient quantities and in a timely manner;
- the ability of engineering talent to drive innovation and new product development;
- the quality of customer service and technical support; and
- the financial reliability, operational stability and reputation of the supplier.

We believe that we compete favorably with respect to these factors. We compete primarily with both our customers' internal design resources and other suppliers of high-performance analog semiconductor solutions for use in wireless and wireline RF, microwave, millimeterwave and photonic applications, some of whom have greater financial resources and scale than us. We expect competition in our markets to intensify, as new competitors enter these markets, existing competitors merge or form alliances and new technologies emerge. We believe that in the future there will be increased competition from companies utilizing alternative technologies, including high-volume manufacturers using low-cost silicon process technology. Some of our competitors are also our customers, and in certain product categories we compete with semiconductor manufacturers from which we also obtain foundry services, such as Sumitomo Electric Device Innovations, Inc.

We compete with Broadcom Inc. ("Broadcom") across our primary markets, Telecom, Data Center and I&D. In the Telecom and Data Center markets, we compete with NXP Semiconductors N.V. ("NXP"), Wolfspeed, Inphi Corporation ("Inphi"), Maxlinear Inc. ("Maxlinear") and Semtech Corporation ("Semtech"). In the I&D market, we compete with Analog Devices, Inc. ("ADI"), Microchip Technology Incorporated ("Microchip"), Qorvo, Inc. ("Qorvo") and Skyworks Solutions, Inc. ("Skyworks").

Backlog and Inventory

Our sales are made primarily on a purchase order basis, rather than pursuant to long-term contracts where the customer commits to buy any minimum amount of product over an extended period. On occasion, we ship finished goods inventory to certain customer or third-party "hub" locations, but do not recognize revenue associated with such shipments until these customers consume the inventory from the hub. We also frequently ship products from our inventory shortly after receipt of an order, which we refer to as "turns business". A substantial portion of our revenues for any particular fiscal quarter may be derived from turns business transacted in the last few weeks of the quarter, and unanticipated fluctuations in turns business may result in material shifts in revenue between fiscal quarters. Due to the foregoing factors, different ordering patterns of our customers and the wide range of lead times to produce and deliver our products, we believe that backlog as of any particular date may not be a reliable indicator of our future revenue levels.

Intellectual Property

Our success depends in part upon our ability to protect our intellectual property. To accomplish this, we rely on a combination of intellectual property rights, including patents, copyrights, trademarks and trade secrets, as well as customary contractual protections with our customers, suppliers, employees and consultants.

As of September 27, 2019, we had 684 U.S. and 148 foreign issued patents and 88 U.S. and 142 foreign pending patent applications covering elements of circuit design, manufacturing and wafer fabrication. We do not know whether any of our pending patent applications will result in the issuance of patents or whether the examination process will require us to narrow our claims. The expiration dates of our patents range from 2019 to 2038. We do not regard any of the patents scheduled to expire in the next twelve months as material to our overall intellectual property portfolio. Notwithstanding our active pursuit of patent protection when available, we believe that our future success will be determined by the innovation, technical expertise and management abilities of our engineers and management more than by patent ownership.

The semiconductor industry is characterized by the existence of a large number of patents, copyrights, trademarks and trade secrets, and by the vigorous pursuit, protection and enforcement of intellectual property rights. Many of our customer agreements require us to indemnify our customers for third-party intellectual property infringement claims, which may in the future require that we defend those claims and might require that we pay damages in the case of adverse rulings. Claims of this sort could harm our relationships with our customers and might deter future customers from doing business with us. With respect to any intellectual property rights claims against us or our customers or distributors, we may be required to cease manufacture of the infringing product, pay damages or settlement amounts, expend resources to develop non-infringing technology, seek a license, which may not be available on commercially reasonable terms or at all, or relinquish patents or other intellectual property rights.

Manufacturing, Sources of Supply and Raw Materials

When designing a product solution for our customers, we may choose to utilize our internal proprietary process technologies or technologies from external fabrication facilities, or a combination of both. We believe our ability to select both internal and external technologies in our product solutions is a competitive advantage because it helps us to provide a unique and optimized solution for our customers.

Our internal wafer fabrication and the majority of our internal assembly and test operations are conducted at our Lowell, Massachusetts headquarters. We believe having U.S.-based wafer fabrication is a competitive advantage for us over competitors that do not have this capability, because it provides us with greater control over quality, a secure source of supply and a domestic source for U.S. I&D customers. We also believe that our U.S.-based wafer fabrication facilitates shorter time to market for both new and existing products, shorter production lead times than if we utilized external foundries and allow us to efficiently produce a wide range of low, medium and high volume products. We perform internal assembly and test functions at our Lowell, Massachusetts, Nashua, New Hampshire, Ann Arbor, Michigan and Hsinchu, Taiwan locations.

We complement our internal manufacturing with outsourced foundry partners and other suppliers. Our operations team has extensive expertise in the management of outsourced manufacturing service providers and other supply chain participants. We believe our fab-lite model of outsourcing certain of our manufacturing activities rather than investing heavily in capital-intensive production facilities, provides us with the flexibility to respond to new market opportunities, simplifies our operations, provides access to other process technologies and additional manufacturing capacity and reduces our capital requirements. We also use third-party contract manufacturers for assembly, packaging and test functions, and in some cases for fully-outsourced turnkey manufacturing of our products.

The principal materials used in the production of our IC products are high purity source materials such as gallium, aluminum, arsenic, nitrite, carbon and silicon. We purchase from hundreds of suppliers worldwide, a wide variety of semiconductors, wafers, packages, metals, printed circuit boards, electromechanical components and other materials for use in our operations. These supply relationships are generally conducted on a purchase order basis. The use of external suppliers involves a number of risks, including the possibility of material disruptions in the supply of key raw materials and components, and the lack of control over delivery schedules, capacity, quality and costs.

While we attempt to maintain alternative sources for our principal raw materials to reduce the risk of supply interruptions or price increases, some of the raw materials and components are not readily available from alternate suppliers due to their unique nature, design or the length of time necessary for re-design or qualification. We routinely utilize single sources of supply for various materials based on availability, performance, efficiency or cost considerations. For example, wafers procured from merchant foundries for a particular process technology are generally sourced through a single foundry on which we rely for all of our wafers in that process. Our reliance on external suppliers puts us at risk of supply chain disruption if a supplier does not have sufficient raw material inventory to meet our manufacturing needs, goes out of business, changes or discontinues the process in which components or wafers are manufactured or declines to continue supplying us for competitive or other reasons, as discussed in more detail in "Item 1A. "Risk Factors" herein. Where practical, we attempt to mitigate these risks by qualifying multiple sources of supply, redesigning products for alternative components and purchasing incremental inventory of raw materials and components in order to protect us against supply disruptions.

Quality Assurance

The goal of our quality assurance program is for our products to meet our customers' requirements, be delivered on time, and function reliably throughout their useful lives. The ISO provides models for quality assurance for various operational disciplines, such as design, manufacturing, and testing, which comprise part of our overall quality management system. Our following locations have each received ISO 9001:2015 certifications in one or more of their principal functional areas: Lowell, Massachusetts; Cork, Ireland; Ithaca, New York; Santa Clara and Newport Beach, California; Morrisville, North Carolina; Ann Arbor, Michigan; Nashua, New Hampshire; and Hsinchu, Taiwan. In addition, our Lowell, Massachusetts facility has received an ISO 14001:2015 environmental management systems certification.

Environmental Regulation

Our operations involve the use of hazardous substances and are regulated under federal, state and local laws governing health and safety and the environment in the U.S. and other countries. These regulations include limitations on discharge of pollutants into the air, water and soil; remediation requirements; product chemical content limitations; manufacturing chemical use and handling restrictions; pollution control requirements; waste minimization considerations; and, requirements regarding the treatment, transport, storage and disposal of hazardous wastes. We are also subject to regulation by the U.S. Occupational Safety and Health Administration and similar health and safety laws in other jurisdictions. While we are committed to compliance with applicable regulations, the risk of environmental liabilities can never be completely eliminated and there can be no assurance that the application of environmental and health and safety laws to our business will not require us to incur material future expenditures.

We are also regulated under a number of federal, state and local laws regarding responsible sourcing, recycling, product packaging and product content requirements in the U.S. and other countries, including legislation enacted in the European Union and other foreign jurisdictions that have placed greater restrictions on the use of lead, among other chemicals, in electronic products, which affects materials composition and semiconductor packaging. These laws are becoming more stringent and may in the future cause us to incur material expenditures or otherwise cause financial harm.

Export Regulations

We market and sell our products both inside and outside the U.S. Certain products are subject to the Export Administration Regulations, administered by the U.S. Department of Commerce, Bureau of Industry and Security ("BIS"), which require that we obtain an export license before we can export certain controlled products or technology to specified countries. Additionally, some of our products are subject to the International Traffic in Arms Regulations, which restrict the export of information and material that may be used for military or intelligence applications by a foreign person. Similar controls exist in other jurisdictions. Failure to comply with these laws could result in sanctions by the government, including substantial monetary penalties, denial of export privileges and debarment from government contracts. We maintain an export compliance program staffed by dedicated personnel under which we screen export transactions against current lists of restricted exports, destinations and end users with the objective of managing export-related decisions, transactions and shipping logistics to ensure compliance with these requirements.

Employees

As of September 27, 2019, we employed approximately 1,100 individuals worldwide. None of our domestic employees are represented by a collective bargaining agreement; however, as of September 27, 2019, approximately 15 of our employees working in certain European locations were covered by collective bargaining agreements. We consider our relations with employees to generally be good and we have not experienced a work stoppage due to labor issues.

History and Recent Developments

We were incorporated under the laws of the State of Delaware in March 2009. Our operations are conducted through our various subsidiaries, which are organized and operated according to the laws of their respective jurisdictions of incorporation.

MACOM Technology Solutions Inc., our primary operating subsidiary, which provides high-performance analog semiconductor solutions for use in wireless and wireline applications across the RF, microwave, millimeterwave and lightwave spectrum, was incorporated under the laws of the state of Delaware on July 16, 2008. MACOM Technology Solutions Limited, our primary foreign operating subsidiary, was incorporated under the laws of Ireland on November 18, 2008. The heritage of some of our business operations date back over 65 years to the founding of Microwave Associates, Inc. and the MACOM brand dates back over 30 years.

We completed acquisitions and divestitures during fiscal years 2017 and 2018 to attempt to further align our businesses to our primary markets. Those transactions include:

In January 2017, we acquired Applied Micro Circuits Corporation ("AppliedMicro"), a global provider of silicon solutions for next-generation cloud infrastructure and Cloud Data Centers, as well as connectivity products for edge, metro and long-haul communications

equipment (the "AppliedMicro Acquisition"). We acquired AppliedMicro in order to expand our business in enterprise and Cloud Data Center applications.

In connection with the acquisition of AppliedMicro, we announced a plan to divest their Compute business (the "Compute business"). On October 27, 2017, we sold the Compute business and received an equity interest in the buyer.

In fiscal year 2017, we completed the acquisitions of Triple Play Communications Corporation ("TPC"), Antario Technologies ("Antario") and Picometrix LLC ("Picometrix") in order to further expand our design center capabilities and expand our business in enterprise and Cloud Data Center applications.

In May 2018, we divested our long-range optical subassembly product line that we had acquired through our December 2015 acquisition of FiBest Limited ("LR4 business"). The LR4 business did not meet our expectations for profitable growth.

Our acquisition strategy is intended to accelerate our revenue growth, expand our technology portfolio, grow our addressable market and create shareholder value.

Available Information

We maintain a website at www.macom.com, including an investors section, at which we routinely post important information, such as webcasts of quarterly earnings calls and other investor events in which we participate or host, and any related materials. We encourage investors to monitor our website, in addition to following our press releases, SEC filings and public conference calls and webcasts, as well as our social media channels (MACOM's LinkedIn, Facebook and YouTube pages and Twitter account (@MACOMtweets)). You may access our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, as well as other reports relating to us that are filed with or furnished to the SEC, free of charge in the investors section of our website as soon as reasonably practicable after such material is electronically filed with or furnished to the SEC. The SEC maintains a website that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC at www.sec.gov. The contents of the websites mentioned above, as well as our LinkedIn, Facebook and YouTube pages and Twitter account, are not incorporated into and should not be considered a part of this report.

ITEM 1A. RISK FACTORS

Our business involves a high degree of risk. You should carefully consider the following risks and other information in this Annual Report in evaluating the Company and its common stock. If any of the following risks actually occurs, our business, financial condition or results of operations could suffer. The risks described below are not the only ones facing us. Additional risks not presently known to us or that we currently consider immaterial may also adversely affect our Company.

Risks Relating to Our Business

Our revenue growth and gross margin are substantially dependent on our successful development and release of new products.

Maintaining or growing our revenue will depend on our ability to timely develop new products for existing and new markets that meet customers' performance, reliability and price expectations. In addition, the average selling prices of our products are expected to decrease over time and we must introduce new products that can be manufactured at lower costs or that command higher prices based on superior performance to offset this expected price erosion. If we are not able to repeatedly introduce, in successive years, new products that ship in volume, our revenue will likely not grow and may decline significantly and rapidly. The development of new products is a highly complex process, and we have in the past and may in the future experience delays and failures in completing the development and introduction of new products. Our successful product development depends on a number of factors, including the following:

- the accurate prediction of market requirements, changes in technology and evolving standards;
- the availability of qualified product designers and process technologies needed to solve difficult design challenges in a cost-effective, reliable manner;
- our ability to design products that meet customers' cost, size and performance requirements and other technical specifications;
- our ability to design and manufacture new products in volume with acceptable manufacturing yields, and deliver them to customers in time for the applicable market adoption window;
- our ability to offer new products at competitive prices;
- the acceptance by customers of our new product designs;
- the identification of and timely entry into new markets for our products;
- the acceptance of our customers' products by the market and the lifecycle of such products;

- our ability to innovate, the strength of our intellectual property rights, and our ability to protect our intellectual property rights;
- our ability to obtain, on commercially reasonable terms, licenses to necessary third party intellectual property rights; and
- our ability to maintain and increase our level of product content in our customers' systems.

A new product design effort may last twelve to eighteen months or longer, and requires significant investment in engineering hours and materials, as well as sales and marketing expenses, which may not be recouped if the product launch is unsuccessful. The introduction of new products by our competitors, the delay or cancellation of a platform for which any of our semiconductor solutions is designed, the market acceptance of products based on new or alternative technologies or the emergence of new industry standards could render our existing or future products uncompetitive from a pricing standpoint, obsolete and otherwise unmarketable. Our failure to anticipate or timely develop new or enhanced products or technologies in response to technological shifts could result in decreased revenue and our competitors obtaining design wins. We may be unable to design, introduce, manufacture or deliver new products in a timely or cost-efficient manner, and our new products may fail to meet the requirements of the market or our customers, or may be adopted by customers more slowly than we expect. In that case, our gross margin may decrease, we may not reach our expected level of production orders and we may lose market share, which could adversely affect our ability to sustain our revenue growth or maintain our current revenue levels.

Underutilization, price competition, acquisitions and various other factors may reduce our gross margin, which could negatively affect our business, financial condition and results of operations.

If we are unable to utilize our design, fabrication, assembly and test facilities at a high level, the significant fixed costs associated with these facilities may not be fully absorbed, resulting in higher than average unit costs and lower gross margin. Similarly, when we compete for business on the basis of our products' unit price, the average selling price of our products is reduced, negatively affecting our gross margins. We have in the past and may in the future acquire businesses with lower-margin products that reduce our overall gross margins. Our various products have different gross margins. Increased sales of lower-margin products, such as certain of our more mature products, in a given period relative to sales of higher-margin products, may cause us to report lower overall gross margin. In addition, increased raw material costs, changes in manufacturing yields, more complex engineering requirements and certain other factors can reduce our gross margins from time to time. We have experienced periods where our gross margin declined due to these and other factors, and expect these factors will have an adverse impact on our business, financial condition and results of operations from time to time in the future. As a result of these or other factors, we may be unable to maintain or increase our gross margin in future periods and our gross margin may fluctuate from period to period.

Our operating results may fluctuate significantly from period to period. We may not meet investors' quarterly or annual financial expectations and, as a result, our stock price may decline.

Our quarterly and annual operating results and related expectations may vary significantly in the future based upon a number of factors, many of which are beyond our control. Factors that could cause operating results and related expectations to fluctuate include:

- the general economic growth or decline in the U.S. or foreign markets;
- the reduction or cancellation of orders by customers, whether as a result of a loss of market share by us or our customers, changes in the design of customers' products or slowing demand for our products or customers' products;
- the amount of new customer orders we book and ship in any particular fiscal quarter, which accounts for a material amount of our net revenue in any particular quarter, and which can often be weighted toward the latter part of each fiscal quarter, making the timing of recognition of the associated revenue difficult to forecast and susceptible to slippage between quarters;
- the relative linearity of our shipments within any particular fiscal quarter, in that a less linear shipment pattern within a given fiscal quarter tends to result in lower gross margin in that quarter and a shipment pattern weighted toward the latter part of a fiscal quarter tends to reduce our cash flows from operations in that quarter, as collections of related receivables do not occur until later fiscal periods;
- the gain or loss of a key customer or significant changes in demand from or the financial condition of one or more key customers;
- fluctuations in the levels of component inventories held by our customers, as well as their ability to manage the inventory that they hold and to forecast accurately their demand for our products;
- the fluctuations in manufacturing output, yields, capacity levels, quality control or other potential problems or delays we or our subcontractors may experience in the fabrication, assembly, testing or delivery of our products;
- the fluctuations in demand relating to the I&D market due to changes in government programs, budgets or procurement;
- the market acceptance of our products and particularly the timing and success of new product and technology introductions by us, customers or competitors;

- our ability to predict market requirements and evolving industry standards accurately and in a timely manner;
- the amount, timing and relative success of our investments in research and development, which impacts our ability to develop, introduce and market new products and solutions on a timely basis;
- the period-to-period changes in the mix of products we sell, which can result in lower gross margin;
- the availability, quality and cost of semiconductor wafers and other raw materials, equipment, components and internal or outsourced manufacturing, packaging and test capacity, particularly where we have only one qualified source of supply;
- the effects of seasonal and other changes in customer demand;
- the effects of competitive pricing pressures, including decreases in average selling prices of our products;
- the effects of impairment charges associated with intangible assets, including goodwill and acquisition-related intangible assets;
- the loss of key personnel or the shortage of available skilled workers;
- the effects of factors that could cause our reported domestic and foreign income taxes and income tax rate to increase in future periods, such as limits on our ability to utilize net operating losses or tax credits and the geographic distribution of our income, which may change from period to period;
- the exposure of our operations to possible capital and exchange controls, expropriation and other restrictive government actions, changes in intellectual property legal protections and remedies, as well as political unrest, unstable governments and legal systems and inter-governmental disputes;
- further clarifications and/or changes in interpretations of existing laws and regulations, trade policies or changes in laws and regulations, in the U.S. and other countries; and
- the effects of war, natural disasters, acts of terrorism, macroeconomic uncertainty or decline or geopolitical unrest.

The foregoing factors are difficult to forecast, and these, as well as other factors, could materially and adversely affect our quarterly and annual operating results and related expectations for future periods. If our operating results in any period do not meet our publicly stated guidance or the expectations of investors or securities analysts, our stock price may decline. Similarly, any publicly stated guidance we provide in the future may fail to meet the expectations of investors or securities analysts and our stock price may decline and has, in the past, declined as a result.

If demand for our products in our primary markets declines or fails to grow, our revenue and profitability may suffer.

Our future growth depends on our ability to anticipate demand and respond to that demand with products that address our customers' needs. To a significant extent, this growth depends on the continued growth in usage of advanced electronic systems in our primary markets: Telecom, Data Center and I&D generally, and in the optical networks market in particular, which accounted for 18.5% of our revenue in the fiscal year ended September 27, 2019. The rate and extent to which these markets will grow, if at all, is uncertain. For example, we anticipate significant growth in the demand for our products in Cloud Data Centers, and have focused significant internal resources to meet that anticipated demand. Our ability to capitalize on this and our other previously announced market opportunities in 100G optical networks and GaN technology will depend on, among other things, the future size and growth rates of these markets, the next generation technologies selected by customers, the timing of network upgrades in these markets and the future pace of adoption of our products in these markets. Our markets may fail to grow or decline for many reasons, including macro-economic factors, insufficient consumer demand, technological hurdles, research and development delays, lack of access to capital, sequestration or other changes in the U.S. defense budget and procurement processes and changes in export controls or other regulatory environments. Even if our primary markets grow, demand for our products in those markets may fail to grow in the event that they fail to embrace next-generation technologies we offer such as GaN-on-Silicon and etched facet lasers, or adopt technologies other than those we offer or implement changes in network specifications that our products do not adequately address. For instance, if demand for our products targeting 10 Gigabit PON or Cloud Data Center deployments is lower or slower to materialize than we anticipate, or we fail to deliver a portfolio of 10 Gigabit PON or Cloud Data Center products that meets the full set of solution requirements our customers demand within the requisite market window, our revenues could fail to grow or decline and our results of operations could be adversely affected. If demand for electronic systems that incorporate our products declines, fails to grow or grows more slowly than we anticipate, purchases of our products may be reduced, which will adversely affect our business, financial condition and results of operations. A failure to predict demand or respond to demand with successful products in timely fashion will materially affect our revenues and profitability.

We typically depend on orders from a limited number of customers for a significant percentage of our revenue.

In the fiscal year ended September 27, 2019, no direct customer accounted for 10% or more of our revenue and sales to our top 10 direct and distribution customers accounted for an aggregate of 53.6% of our revenue. While the composition of our top 10 customers varies from year to year, we expect that sales to a limited number of customers will continue to account for a significant percentage of

our revenue for the foreseeable future. The purchasing arrangements with our customers are typically conducted on a purchase order basis that does not require our customers to purchase any minimum amount of our products over a period of time. As a result, it is possible that any of our major customers could terminate their purchasing arrangements with us with little or no warning and without penalty, or significantly reduce or delay the amount of our products that they order, purchase products from our competitors or develop their own products internally. The loss of, or a reduction in, orders from any major customer may cause a material decline in revenue and adversely affect our results of operations.

We are subject to risks from our international sales and operations.

We have operations in Europe and Asia, and customers around the world. As a result, we are subject to regulatory, geopolitical and other risks associated with doing business outside the U.S. Global operations involve inherent risks, including currency controls, currency exchange rate fluctuations, new or potential international trade agreements, tariffs, required import and export licenses, associated delays and other related international trade restrictions and regulations. Further, there is a risk that language barriers, cultural differences and other factors associated with our international operations may make them more difficult to manage effectively.

The legal system in many of the regions where we conduct business can lack transparency in certain respects relative to that of the U.S. and can accord local government authorities a higher degree of control and discretion over business than is customary in the U.S. This makes the process of obtaining necessary regulatory approvals and maintaining compliance inherently more difficult and unpredictable. In addition, the protection accorded to proprietary technology and know-how under these legal systems may not be as strong as in the U.S., and, as a result, we may lose valuable trade secrets and competitive advantages. The cost of doing business in European jurisdictions can also be higher than in the U.S. due to exchange rates, local collective bargaining regimes and local legal requirements and norms regarding employee benefits and employer-employee relations, in particular. We are also subject to U.S. legal requirements related to our foreign operations, including the Foreign Corrupt Practices Act. Sales to customers located outside the U.S. accounted for 52.1% of our revenue for the fiscal year ended September 27, 2019.

Sales to customers located in China and the Asia Pacific region typically account for a substantial majority of our overall sales to customers located outside the U.S. We expect that revenue from international sales generally, and sales to China and the Asia Pacific region specifically, will continue to be a material part of our total revenue. Therefore, any financial crisis, trade war or dispute or other major event causing business disruption in international jurisdictions generally, and China and the Asia Pacific region in particular, could negatively affect our future revenues and results of operations. For example, in 2016 the BIS temporarily blocked exports of U.S. products to Chinese telecommunications OEM Zhongxing Telecommunications Equipment Corporation ("ZTE"). More recently, in April 2018, the BIS again blocked exports of U.S. products to ZTE, which were lifted in July 2018. ZTE is under a court-ordered monitorship, which means that if it does not comply with certain requirements similar export control prohibitions could be imposed again. Also, in August 2018, the BIS blocked exports of U.S. products to certain Chinese aerospace customers. More recently, in January 2019, the U.S. Department of Justice announced criminal charges against Huawei including, but not limited to, attempts theft of trade secrets, wire fraud and violations of U.S. sanctions related to Iran. On May 16, 2019, the BIS added Huawei and many of its affiliates to the Entity list, which effectively blocks exports of U.S. products to Huawei and the affiliates. A U.S. ban on exports to one or more large OEM customers could materially reduce our revenue and reduce the value of an investment in our common stock. Unlike other types of U.S. government sanctions, the Huawei Entity list prohibitions do not apply to the shipment from outside the United States of certain foreign-made items that are not within the jurisdiction of the export control regulations. We believe that a small number of our foreign-made products are not within the scope of the Entity List prohibitions and we have resumed shipments of them to Huawei from outside the United States. If the U.S. Government is uncertain about whether such items were not subject to U.S. export controls, it could conduct an investigation and, if it is determined that some of the items were subject to U.S. export control jurisdiction, result in costs, fines or penalties that could have a material impact on our business.

Because the majority of our foreign sales are denominated in U.S. dollars, our products become less price-competitive in countries with currencies that are low or are declining in value against the U.S. dollar. Also, we cannot be sure that our international customers will continue to accept orders denominated in U.S. dollars. If they do not, our reported revenue and earnings will become more directly subject to foreign exchange fluctuations. Some of our customer purchase orders and agreements are governed by foreign laws, which may differ significantly from U.S. laws. As a result, we may be limited in our ability to enforce our rights under such agreements and to collect amounts owed to us.

The majority of our assembly, packaging and test vendors are located in Asia. We generally do business with our foreign assemblers in U.S. dollars. Our manufacturing costs could increase in countries with currencies that are increasing in value against the U.S. dollar. Also, our international manufacturing suppliers may not continue to accept orders denominated in U.S. dollars. If they do not, our costs will become more directly subject to foreign exchange fluctuations. From time to time, we may attempt to hedge our exposure to foreign currency risk by buying currency contracts or otherwise, and any such efforts involve expense and associated risk that the currencies involved may not behave as we expect and we may lose money on such hedging strategies or not properly hedge our risk.

In addition, if terrorist activity, armed conflict, civil, economic or military unrest, natural disasters, embargoes or other economic sanctions, enforcement actions against governments, governmental entities or private entities or political instability occurs in the U.S. or other locations, such events may disrupt our manufacturing, assembly, logistics, security and communications, and could also result in reduced demand for our products. We have in the past and, may again in the future, experience difficulties relating to employees traveling

in and out of countries facing civil unrest or political instability and with obtaining travel visas for our employees. Major health pandemics could also adversely affect our business and our customer order patterns. We could also be affected if labor issues disrupt our transportation arrangements or those of our customers or suppliers. There can be no assurance that we can mitigate all identified risks with reasonable effort. The occurrence of any of these events could have a material adverse effect on our operating results.

Changes in U.S. and international laws, accounting standards, export and import controls and trade policies or the enforcement of, or attempt to enforce, such laws, standards, controls and policies, particularly with regard to China, may adversely impact our business and operating results.

Our future results could be adversely affected by changes in interpretations of existing laws and regulations, or changes in laws and regulations, including, among others, changes in accounting standards, taxation requirements, competition laws, trade laws, import and export restrictions, privacy laws and environmental laws in the U.S. and other countries.

The U.S. government has recently made statements and taken certain actions that have led to, and may lead to further, changes to U.S. and international export and import controls or trade policies, including recently-imposed tariffs affecting certain products exported by a number of U.S. trading partners, including China. In response, many of those trading partners, including China, have imposed or proposed new or higher tariffs on American products. It is unknown whether and to what extent new tariffs (or other new laws or regulations) will be adopted, or the effect that any such actions would have on us or our industry and customers. Any unfavorable government policies on international trade, such as export and import controls, capital controls or tariffs, may affect the demand for our products and services, increase the cost of components, delay production, impact the competitive position of our products or prevent us from being able to sell products in certain countries. If any new export or import controls, tariffs, legislation and/or regulations are implemented or if existing trade agreements are renegotiated such changes could have an adverse effect on our business, financial condition, results of operations. In addition, proceedings to enforce, or the enforcement of, any laws, regulations and policies by the U.S. or other countries, and the resulting response to such actions, may have an adverse effect on our business, financial condition and results of operations.

Our investment in technology as well as research and development may not be successful, which may impact our profitability.

The semiconductor industry requires substantial investment in technology as well as research and development in order to develop and bring to market new and enhanced technologies and products. Research and development expenses were \$163.5 million for the fiscal year ended September 27, 2019. In each of the last three fiscal years, we invested in research and development as part of our strategy toward the development of innovative products and solutions to fuel our growth and profitability. We cannot assure you if, or when, the products and solutions where we have focused our research and development expenditures will become commercially successful. In addition, we may not have sufficient resources to maintain the level of investment in research and development required to remain competitive or succeed in our strategy. Our efforts to develop new and improved process technologies for use in our products require substantial expenditures that may not generate any return on investment, may take longer than we anticipate to generate a return or may generate a return on investment that is inadequate. Following our Nitronex Acquisition, we announced a number of strategic plans and positive expectations concerning the future cost structure, manufacturability, opportunity for strategic partnerships and licensing programs, market applicability and potential positive impact on our market share of GaN-on-Silicon technology, which is a focus of the Nitronex business. We have in the past and continue to experience unexpected difficulties, expenses or delays in qualifying our GaN-on-Silicon process technology either internally or at one or more third party foundries and qualifying related products with our customers, and we were engaged in a litigation with the former licensor of this technology as described elsewhere in this Annual Report. We may not be successful in process or product qualification, manufacturing cost reduction or marketing efforts related to GaN-on-Silicon, may not realize the competitive advantage we anticipate from related investments and may not realize customer demand for this technology that meets our expectations, any of which could lead to higher than expected operating expense, lower than expected revenue and gross margin, associated charges or otherwise reduce the price of our common stock. We also have undertaken significant research and development efforts aimed at new products targeting market segments where we see potential for growth including the wireless basestation and Cloud Data Center. We may not be successful in our research and development efforts or may not realize the competitive advantage, revenues or profits we anticipate from these new products, any of which may lead to higher research and development expense, lower than expected revenues and gross margin and reduced profitability, or may otherwise harm our business or reduce the price of our common stock. Such results, or anticipated results, may cause us to reevaluate our investment in those areas of our business. For example, in June 2019 we announced our plans to cease investing in the design and development of optical modules and subsystems for Data Center applications.

We may incur significant risk and expense in attempting to win new business and such efforts may never generate revenue.

To obtain new business, we often need to win a competitive selection process to develop semiconductors for use in our customers' systems, known in the industry as a "design win". These competitive selection processes can be lengthy and can require us to incur significant and unreimbursed design and development expenditures and dedicate scarce engineering resources in pursuit of a single customer opportunity, particularly when seeking to develop or introduce solutions in new markets. We may not win the competitive selection process or may never generate any revenue despite incurring significant design and development expenditures and selling, general and administrative expenses. Failure to obtain a design win may prevent us from supplying components for an entire generation of a customer's system. This can result in lost or foregone revenue and could weaken our position in future competitive selection processes or cause us to fail to meet revenue projections or expectations.

Even when we achieve a design win, success is not guaranteed. Customer qualification and design cycles can be lengthy, and it may take a year or more following a successful design win and product qualification for one of our products to be purchased in volume by the customer. We may experience difficulties manufacturing the part in volume, such as low yields, supply chain delays or shortages or quality issues. Further, while the customer has successfully qualified our part for use in its system, it may not have qualified all of the other components being sourced for its system, or qualified its system as a whole with its end customers. Any difficulties our customer may experience in completing those qualifications may delay or prevent us from translating the design win into revenue. These risks can be particularly acute in our I&D market, where we may spend material amounts and commit substantial design engineering resources to product development work in support of an OEM customer's attempt to win business tied to a government contract award, but realize no related revenue or less than expected revenue from our investment due to failure of the OEM customer to win the business, government program cancellation, federal budget limitations or otherwise. Any of these events or any cancellation of a customer's program or failure of our customer to market its own product successfully after our design win, could materially and adversely affect our business, financial condition and results of operations, as we may have incurred significant expense and generated no revenue.

We are subject to order and shipment uncertainties. Our profitability will decline if we fail to accurately forecast customer demand when managing inventory.

We generally sell our products on the basis of purchase orders rather than long-term purchase commitments from our customers. Our customers can typically cancel purchase orders or defer product shipments for some period without incurring a liability to us. We typically plan production and inventory levels based on internal forecasts of customer demand, which can be highly unpredictable and can fluctuate substantially, leading to excess inventory write-downs and resulting negative impacts on gross margin and net income. We have limited visibility into our customers' inventories, future customer demand and the product mix that our customers will require, which could adversely affect our production forecasts and operating margins. The difficulty in predicting demand may be compounded when we sell to OEM customers indirectly through distributors or contract manufacturers, or both, as our forecasts of demand are then based on estimates provided by multiple parties. In a number of markets we serve, large dollar value customer orders scheduled for delivery in the current fiscal quarter may be canceled or rescheduled by the customer for delivery in a future fiscal quarter on short notice, which may cause our reported revenue to vary materially from our prior expectations. In addition, the rapid pace of innovation in our industry could render significant portions of our inventory obsolete. If we overestimate our customers' requirements, we may have excess inventory, which could lead to obsolete inventory and unexpected costs. Further, if we build inventory specific to non-recurring engineering ("NRE") arrangements that we may enter into with our customers from time to time and then fail to achieve one or more required milestones in connection with such NRE arrangements, we may have excess, non-qualified or non-conforming customer specific inventory, which could lead to unsellable inventory and unexpected costs. Conversely, if we underestimate our customers' requirements, we may have inadequate inventory, which could lead to foregone revenue opportunities, loss of potential market share and damage to customer relationships caused by late product deliveries disrupting our customers' production schedules. Some of our larger customers also require us to build and maintain minimum inventories and keep them available for purchase at specified locations based on non-binding demand estimates that are subject to change, which exposes us to increased inventory risk and makes it more difficult to manage our working capital. If demand from such customers decreases, we may be left with excess or obsolete inventory that we are unable to sell. In response to anticipated long lead times to obtain inventory and materials from outside suppliers and foundries, we periodically order materials and build a stock of finished goods inventory in advance of customer demand. This advance ordering of raw material and building of finished goods inventory has in the past and may in the future result in excess inventory levels or unanticipated inventory write-downs if expected orders fail to materialize or other factors make our products less saleable. In addition, any significant future cancellation or deferral of product orders could adversely affect our revenue and margins, increase inventory write-downs due to obsolete inventory or adversely affect our operating results and stock price.

The average selling prices of our products may decrease over time, which could have a material adverse effect on our revenue and gross margin.

It is common in our industry for the average selling price of a given product to decrease over time as production volumes increase, competing products are developed, technology, industry standards and customer platforms evolve or new technologies featuring higher performance or lower cost emerge. We work to actively manage the prices of our existing products, increase our sales volumes and introduce new process technologies and products in the market that exhibit higher performance, new features that are in demand or lower

manufacturing costs. Despite this strategy, we expect to experience price erosion in future periods. Failure to maintain our current prices, to offset price reductions by increasing our sales volumes or to successfully execute on our new product development strategy may cause our revenue and gross margin to decline, which could decrease the value of your investment in our common stock.

We face intense competition in our industry, and our inability to compete successfully could negatively affect our operating results.

The semiconductor industry is highly competitive. While we compete with a wide variety of companies, we compete with Broadcom across most of our primary markets. Our other significant competitors include, among others, NXP, Inphi, Maxlinear, Semtech, ADI, Microchip, Qorvo and Skyworks.

We believe future competition could also come from companies developing new alternative technologies, component suppliers based in countries with lower production costs and IC manufacturers achieving higher levels of integration that exceed the functionality offered by our products. Our customers and suppliers could also develop products that compete with or replace our products. A decision by any of our large customers to design and manufacture ICs internally could have an adverse effect on our operating results. Increased competition has in the past and could in the future lead to lower prices for our products, reduced demand for our products and a corresponding reduction in our ability to recover development, engineering and manufacturing costs.

Many of our existing and potential competitors have entrenched market positions, historical affiliations with original equipment manufacturers, considerable internal manufacturing capacity, established intellectual property rights, strong brand recognition and substantial technological capabilities. Many of them may also have greater financial, technical, manufacturing or marketing resources than we do. The semiconductor industry has experienced significant consolidation over the past several years. Consolidation among our competitors could lead to a changing competitive landscape, which could negatively impact our competitive position and market share and harm our results of operations. In addition, certain countries such as China have begun implementing initiatives to build domestic semiconductor supply chains and we may be at a disadvantage in attempting to compete with entities associated with such foreign government efforts based on their lower cost of capital, access to government largesse, preferential sourcing practices, stronger local relationships or otherwise. Prospective customers may decide not to buy from us due to concerns about our relative size, financial stability or other factors. Our failure to successfully compete could result in lower revenue, decreased profitability and a lower stock price.

We operate in the semiconductor industry, which is cyclical and subject to significant downturns.

The semiconductor industry is highly cyclical and is characterized by constant and rapid technological change, price erosion, product obsolescence, evolving standards, short product lifecycles and significant fluctuations in supply and demand. The industry has historically experienced significant fluctuations in demand and product obsolescence, resulting in product overcapacity, high inventory levels and accelerated erosion of average selling prices. Downturns in this industry may be prolonged, and downturns in many sectors of the electronic systems industry have in the past contributed to extended periods of weak demand for semiconductor products. We have experienced decreases in our revenue, profitability, cash flows and stock price during such downturns in the past, and may be similarly harmed by future downturns, particularly if we are unable to effectively respond to reduced demand in a particular market.

If we are unable to further penetrate into and expand our share into strategic markets or accurately anticipate or react timely or properly to emerging trends, our revenues may not grow and could decline.

Our primary markets, including the Cloud Data Center market, undergo transitions from time to time in which products incorporate new features, interoperability and performance standards on an industry-wide basis. If our products are unable to support the new features or standards required by OEMs or end customers in these markets, or if our products fail to be certified or adopted by OEMs, we will lose business from existing or potential customers and may not have the opportunity to compete for new design wins or certification until the next product transition occurs. If we fail to develop products with required features or standards, we experience a delay in certifying or bringing a new product to market, or our customers fail to achieve market acceptance of their products, our revenues could be significantly reduced for a substantial period. Many of our products targeting Cloud Data Center applications are relatively new or still in development. Even if we succeed in generating customer demand for such products, if we are unable to deliver the quantities required by customers on time and at the right price point, due to design challenges, manufacturing bottlenecks, supply shortages, manufacturing yield issues or otherwise, we may fail to secure or maintain business and our revenues and gross and net margins could be materially and adversely affected.

We may sell, wind down or exit one or more of our businesses or product lines, from time to time, as a result of our evaluation of our businesses, products and markets, and any such divestiture could adversely affect our continuing business.

We periodically evaluate our various businesses and product lines and may, as a result, consider the divestiture, wind down or exit of one or more of those businesses or product lines. For example, in August 2015, we sold our Automotive business based on our belief that it was not consistent with our long-term strategic vision from a growth and profitability perspective. In October 2017, we sold the Compute business that we had acquired through the AppliedMicro Acquisition, as the products were not complementary to our product portfolio and did not strategically align with our long-term focus. In May 2018, we sold certain capital equipment, inventory and other

assets associated with our LR4 business that we had acquired through our December 2015 acquisition of FiBest. More recently, in June 2019 we decided to cease R&D activities related to new programs and wind down ongoing development activities for a certain product line.

Divestitures have inherent risks, including the inability to find potential buyers with favorable terms, the expense of selling the product line, the possibility that any anticipated sale will be delayed or will not occur, the potential impact on our cash flows and results of operations, the potential delay or failure to realize the perceived strategic or financial merits of the divestment or receive milestone, earn-out, royalty or other post-closing payments, difficulties in the separation of operations, services, information technology, products and personnel, potential loss of customers or employees, exposure to unanticipated liabilities, unexpected costs associated with such separation, diversion of management's attention from other business concerns and potential post-closing claims for alleged breaches of related agreements, indemnification or other disputes.

The product families we acquired in our AppliedMicro acquisition face challenges due to declining sales of older products and the evolving dynamics of the networking and communications industries.

The product families we added through our AppliedMicro acquisition face industry-specific challenges, in addition to the risks applicable to our business as a whole. For our connectivity products, order patterns historically have been uneven from period to period. The unpredictable nature of demand in this sector makes it more difficult to forecast our revenues, and may cause us to incur additional expenses for inventory that may need to be written off. Our connectivity product lines are also subject to technology transitions within the communications industry. For example, as the communications industry has continued to shift away from the synchronous optical network ("SONET")/synchronous data hierarchy standard to the higher speed, lower power optical transport network ("OTN") standard, substantially all of our new connectivity product designs utilize the OTN standard. However, as a result of this transition, many of our older, SONET-based connectivity products are experiencing declining sales, while our newer connectivity products, such as the X-Weave product family, have not yet generated significant revenue. Moreover, the transition to OTN, resulting in higher sales volumes and increased competition from integrated solutions providers, is in turn leading to price and margin erosion challenges. The introduction of other technological standards may also affect demand for our products. For our PowerPC product lines, as well, the migration of the networking industry away from products utilizing the PowerPC architecture and towards products utilizing other architectures such as ARM, has presented challenges. In line with this migration, we are no longer introducing new PowerPC product designs and are reducing our resources equipped to support our older PowerPC product lines. Moreover, many of our older, PowerPC-based computing products are experiencing declining sales. If we are unable to develop and deliver new products in other areas that meet changing customer and industry needs and generate sufficient revenue to offset the decline in sales of our older product lines, our business, results of operations and financial condition could be adversely affected.

Our failure to continue to keep pace with new or improved semiconductor process technologies could impair our competitive position.

Semiconductor manufacturers constantly seek to develop new and improved semiconductor process technologies. Our future success depends in part upon our ability to continue to gain access to these semiconductor process technologies, internally or externally, in order to adapt to emerging customer requirements and competitive market conditions. We may be unable to internally develop such technologies successfully and may be unable to gain access to them from merchant foundries or other sources on commercially reasonable terms or at all. If we fail to remain abreast of new and improved semiconductor process technologies as they emerge, we may lose market share and our revenue and gross margin may decline, which could adversely affect our operating results.

If we fail to comply with export control regulations, we could be subject to substantial fines or other sanctions, including loss of export privileges.

Certain of our products are subject to the Export Administration Regulations, administered by the BIS, which require that we obtain an export license before we can export products or technology to specified countries. Other products are subject to the International Traffic in Arms Regulations, which restrict the export of information and material that may be used for military or intelligence applications by a foreign person. U.S. regulators have announced "export control reform" that has changed and is expected to change many of the rules applicable to us in this area in the future in ways we do not yet fully understand and we have experienced and will continue to experience challenges in complying with the new rules as they become effective, resulting in difficulties or an inability to ship products to certain countries and customers.

We are also subject to U.S. import regulations and the import and export regimes of other countries in which we operate. Failure to comply with these laws could result in sanctions by the U.S. government, including substantial monetary penalties, denial of export privileges and debarment from government contracts. Export and import regulations may create delays in the introduction of our products in international markets or prevent the export or import of our products to certain countries or customers altogether. Any change in export or import regulations or related legislation, shift in approach by regulators to the enforcement or scope of existing regulations, changes in the interpretation of existing regulations by regulators, specific sanctions by regulators or change in the countries, persons or technologies targeted by such regulations, could harm our business by resulting in decreased use of our products by or our decreased ability to export

or sell our products to, existing or potential customers with international operations. In addition, our sale of our products to or through third-party distributors, resellers and sales representatives creates the risk that any violation of these laws they may engage in may cause disruption in our markets or otherwise bring liability on us.

We may incur liabilities for claims of intellectual property infringement relating to our products.

The semiconductor industry is generally subject to frequent litigation regarding patents and other intellectual property rights. For example, in 2018 we concluded legal action against Infineon Technologies Americas Corporation and Infineon Technologies AG (collectively, "Infineon") that had been pending in federal court and was brought to confirm and defend our exclusive rights to use certain patented GaN-on-Silicon technology developed by Nitronex in our core RF markets. Other companies in the industry have numerous patents that protect their intellectual property rights in these areas and technology is frequently licensed. In the past, we have been and may in the future be, subject to claims that we have breached infringed or misappropriated patent, license or other intellectual property rights. Our customers may assert claims against us for indemnification if they receive claims alleging that their or our products infringe upon others' intellectual property rights, and have in the past and may in the future choose not to purchase our products based on their concerns over such a pending claim. In the event of an adverse result of any intellectual property rights litigation, we could be required to incur significant costs to defend or settle such litigation, pay substantial damages for infringement, expend significant resources to develop non-infringing technology, incur material liability for royalty payments or fees to obtain licenses to the technology covered by the litigation or be subjected to an injunction, which could prevent us from selling our products, and materially and adversely affect our revenue and results of operations. Negotiated settlements resolving such claims may require us to pay substantial sums. We cannot be sure that we will be successful in any such non-infringing development or that any such license would be available on commercially reasonable terms, if at all. Any claims relating to the infringement of third-party proprietary rights, even if not meritorious, could result in costly litigation, lost sales or damaged customer relationships and diversion of management's attention and resources.

The success of any strategic alliances may be subject to significant uncertainty, and we may be substantially reliant upon certain partner(s) for the commercial success of the opportunity.

The terms of any strategic alliances may subject us to significant uncertainty regarding the success of such transaction as we may be substantially reliant upon a partner for the technical and/or commercial success of the opportunity. In addition, any such transactions may also divert our financial resources and management's attention from other important areas of our business. Furthermore, any failure of a transaction to satisfy customer expectations could adversely impact our own relationships with such customers and/or the reputation of our brand. If a transaction does not progress according to our expectations or anticipated timing, our business could be adversely affected and our investment in such transactions may not be successful. If a transaction is not successful, or not as successful as anticipated, we may also never realize the full, or any, benefit of royalty, milestone and/or other payment terms included in the transaction and may be required to devote more management time and resources in connection with the conclusion of any such alliance.

Many of our products currently incorporate technology licensed or acquired from third parties and we expect our products in the future to also require technology from third parties. If the licenses to such technology that we currently hold become unavailable or the terms on which they are available become commercially unreasonable, or if we are unable to acquire or license necessary technology for our products in the future, our business could be adversely affected.

We sell products in markets that are characterized by rapid technological changes, evolving industry standards, frequent new product introductions and increasing levels of integration. Our ability to keep pace with these markets at times depends on our ability to obtain technology from third parties on commercially reasonable terms to allow our products to remain competitive. If licenses to such technology are not available on commercially reasonable terms and conditions or at all and we cannot otherwise acquire or integrate such technology, our products or our customers' products could become unmarketable or obsolete, we could lose market share and our revenue and results of operations could materially decline. For instance, our connectivity business is a licensee of ARM Limited ("ARM") and Synopsys Inc. ("Synopsys") technology libraries, and continued license rights will depend upon our ability to successfully renew or otherwise maintain our license rights to those libraries, as well as the timely delivery by ARM and Synopsys of various updates and other support under their respective license agreements.

In addition, disputes with third party licensors over required payments, scope of licensed rights and compliance with contractual terms are common in our industry and we have in the past and may in the future be subjected to disputes over the terms of such licenses. Such disputes may require us to incur significant costs defending our license rights, divert management's attention or result in our inability to sell or develop certain products. In such instances, we could also incur substantial unanticipated costs or scheduling delays in developing substitute technology to deliver competitive products, damaged customer and vendor relationships, indemnification liabilities and declining revenues and profitability. Such events could have an adverse effect on our financial condition and results of operations.

We depend on third parties for products and services required for our business, which may limit our ability to meet customer demand, assure product quality and control costs.

We purchase numerous raw materials, such as ceramic packages, precious metals, semiconductor wafers and ICs, from a limited number of external suppliers. We also currently use several external manufacturing suppliers for assembly and testing of our products, and in some cases for fully-outsourced turnkey manufacturing of our products. We currently expect to increase our use of outsourced manufacturing in the future as a strategy. The ability and willingness of our external suppliers to perform is largely outside of our control. The use of external suppliers involves a number of risks, including the possibility of material disruptions in the supply of key components, the lack of control over delivery schedules, capacity constraints, manufacturing yields, quality and fabrication costs and misappropriation of our intellectual property. If these vendors' processes vary in reliability or quality, they could negatively affect our products and, therefore, our customer relations and results of operations. We generally purchase raw materials on a purchase order basis and we do not have significant long-term supply commitments from our vendors. The long-term supply commitments we have may result in an obligation to purchase excess material, which may materially and negatively impact our operating results. In terms of relative bargaining power, many of our suppliers are larger than we are, with greater resources, and many of their other customers are larger and have greater resources than we do. If these vendors experience shortages or fail to accurately predict customer demand, they may have insufficient capacity to meet our demand, creating a capacity constraint on our business. They may also choose to supply others in preference to us in times of capacity constraint or otherwise, particularly where the other customers purchase in higher volume. Third-party supplier capacity constraints have in the past and may in the future prevent us from supplying customer demand that we otherwise could have fulfilled at attractive prices. If we have a firm commitment to supply our customers but are unable to do so based on inability or unwillingness of one of our suppliers to provide related materials or services, we may be liable for resulting damages and expense incurred by our customers.

Based on superior performance features, cost parameters or other factors, we utilize sole source suppliers for certain semiconductor packages and other materials and it is common for one of our outside semiconductor foundries to be our sole supplier for the particular semiconductor fabrication process technologies manufactured at that supplier's facility. Such supplier concentrations involve the risk of a potential future business interruption if the supplier becomes unable or unwilling to supply us at any point. While in some cases alternate suppliers may exist, because there are limited numbers of third-party wafer suppliers that use the process technologies we select for our products and that have sufficient capacity to meet our needs, it may not be possible or may be expensive to find an alternative source of supply. Even if we are able to find an alternative source, moving production to an alternative supplier requires an extensive qualification or re-qualification process that could prevent or delay product shipments or disrupt customer's production schedules, which could harm our business. In addition, some of our external foundry suppliers compete against us in the market in addition to being our supplier. The loss of a supplier can also significantly harm our business and operating results. A supplier may discontinue supplying us if its business is not sufficiently profitable, for competitive reasons or otherwise. We have in the past and may in the future have our supply relationship discontinued by an external foundry, causing us to experience supply chain disruption, customer dissatisfaction, loss of business and increased cost.

If we lose key personnel or fail to attract and retain key personnel, we may be unable to pursue business opportunities or develop our products.

We believe our continued ability to recruit, hire, retain and motivate highly-skilled engineering, operations, sales, administrative and managerial personnel is key to our future success. Competition for these employees is intense, particularly with respect to qualified engineers. Our failure to retain our present employees and hire additional qualified personnel in a timely manner and on reasonable terms could harm our competitiveness and results of operations. In addition, from time to time, we may recruit and hire employees from our competitors, customers, suppliers and distributors, which could result in liability to us and has in the past and could in the future, damage our business relationship with these parties. None of our senior management team is contractually bound to remain with us for a specified period, and we generally do not maintain key person life insurance covering our senior management. The loss of any member of our senior management team could strengthen a competitor, weaken customer relationships or harm our ability to implement our business strategy.

Our internal and external manufacturing, assembly and test model subjects us to various manufacturing and supply risks.

We operate a leased semiconductor wafer processing and manufacturing facility at our headquarters in Lowell, Massachusetts, and at our Ithaca, New York and Ann Arbor, Michigan sites. These facilities are also important internal design, assembly and test facilities. We maintain other internal assembly and test operation facilities as well, including leased sites in Nashua, New Hampshire, and Hsinchu, Taiwan. We also use multiple external foundries for outsourced semiconductor wafer supply, as well as multiple domestic and Asian assembly and test suppliers to assemble and test our products. A number of factors will affect the future success of these internal manufacturing facilities and outsourced supply and service arrangements, including the following:

- the level of demand for our products;
- our ability to expand and contract our facilities and purchase commitments in a timely and cost-effective manner in response to changes in demand for our products;
- our ability to generate revenue in amounts that cover the significant fixed costs of operating our facilities;

- our ability to qualify our facilities for new products and process technologies in a timely manner and successfully avoid issues that may unduly prolong, or otherwise complicate, the qualification process;
- the availability of raw materials, including GaAs, SiGe and InP substrates and high purity source materials such as gallium, aluminum, arsenic, carbon, nitrite, indium and silicon;
- the availability and continued operation of key equipment, especially any that we may only have access to a limited number of;
- our manufacturing cycle times and yields;
- the political and economic risks associated with our reliance on outsourced Asian assembly and test suppliers;
- the location of our facilities and those of our outsourced suppliers;
- natural disasters, pandemics, acts of terrorism, armed conflicts or unrest impacting our facilities and those of our outsourced suppliers;
- our ability to hire, train, manage and retain qualified production personnel;
- our compliance with applicable environmental and other laws and regulations;
- our ability to avoid prolonged periods of downtime or high levels of scrap in our and our suppliers' facilities for any reason; and
- our ability to negotiate renewals to our existing lease agreements on favorable terms and without disruption to our wafer processing and manufacturing and internal assembly and test operations at our sites where such activities take place.

If we experience issues in any of the above areas, the effectiveness of our supply chain could be adversely affected, and could harm our results of operations.

Sources for certain components, materials and services are limited, which could result in interruptions, delays or reductions in product shipments.

Our industry may be affected from time to time by limited supplies of certain key components, materials and services. We have in the past and may in the future, experience delays or reductions in supply shipments, which could reduce our revenue and profitability. If key components, materials or services are unavailable, our costs could increase and our revenue could decline.

In particular, our manufacturing headquarters, design facilities, assembly and test facilities and supply chain, and those of our contract manufacturers, are subject to risk of catastrophic loss due to fire, flood or other natural or man-made disasters. The majority of our internally-manufactured semiconductor products are fabricated in our Lowell, Massachusetts headquarters. The majority of the internal and outsourced assembly and test facilities we utilize are located in the Pacific Rim and some of our internal design, assembly and test facilities are located in California regions with above average seismic and severe weather activity. In addition, our research and development personnel are concentrated in a few locations, with the expertise of the personnel at each such location generally focused on one or two specific areas. Any catastrophic loss or significant damage to any of these facilities would likely disrupt our operations, delay production, shipments and revenue and result in significant expenses to repair or replace the facility and, in some instances, could significantly curtail our research and development efforts in a particular product area or primary market, which could have a material adverse effect on our operations. In particular, any catastrophic loss at our Lowell, Massachusetts headquarters could materially and adversely affect our business and financial results, revenue and profitability.

Remaining competitive in the semiconductor industry requires transitioning to smaller geometry process technologies and achieving higher levels of design integration.

In order to remain competitive, we expect to continue to transition our products to increasingly smaller geometries. This transition requires us to modify the manufacturing processes for our products, to design new products to more stringent standards and to redesign some existing products. In some instances, we depend on our relationships with our third-party foundries to transition to smaller geometry processes successfully. Our foundries may not be able to effectively manage the transition or we may not be able to maintain our foundry relationships. If our foundries or we experience significant delays in this transition or fail to efficiently implement this transition, our business, financial condition and results of operations could be materially and adversely affected. As smaller geometry processes become more prevalent, we expect to continue to integrate greater levels of functionality into our products. However, we may not be able to achieve higher levels of design integration or deliver new integrated products on a timely basis or at all.

Our business may be adversely affected if we experience product returns, product liability and defects claims.

Our products are complex and frequently operate in high-performance, challenging environments. We may not be able to anticipate all of the possible performance or reliability problems that could arise with our products after they are released to the market. If such problems occur or become significant, we may experience reduced revenue and increased costs related to product recalls, inventory write-offs, warranty or damage claims, delays in, cancellations of or returns of product orders and other expenses. Certain of our distributors

have inventory return and or rotation rights, which may result in higher than expected product returns. The many materials and vendors used in the manufacture of our products increase the risk that some defects may escape detection in our manufacturing process and subsequently affect our customers, even in the case of long-standing product designs. Our use of newly-developed or less mature semiconductor process technologies, such as GaN and InP, which have a less extensive track record of reliability in the field than other more mature process technologies, also increases the risk of performance and reliability problems. These matters have arisen in our operations from time to time in the past, have resulted in significant expense to us per occurrence and will likely occur again in the future. The occurrence of defects could result in product returns and liability claims, reduced product shipments, the loss of customers, the loss of or delay in market acceptance of our products, harm to our reputation, diversion of management's time and resources, lower revenue, increased expenses and reduced profitability. Any warranty or other rights we may have against our suppliers for quality issues caused by them may be more limited than those our customers have against us, based on our relative size, bargaining power or otherwise. In addition, even if we ultimately prevail, such claims could result in costly litigation, divert management's time and resources and damage our customer and supplier relationships.

We also face exposure to potential liability resulting from the fact that some of our customers integrate our products into consumer products such as automobiles, which are then sold to consumers in the marketplace. We may be named in product liability claims even if there is no evidence that our products caused a loss. Product liability claims could result in significant expenses in connection with the defense of such claims and possible damages. In addition, we may be required to participate in a recall if our products prove to be defective. Any product recall or product liability claim brought against us, particularly in high-volume consumer markets, could have a material negative impact on our reputation, business, financial condition or results of operations.

Minor deviations in the manufacturing process can cause substantial manufacturing yield loss or even cause halts in production, which could have a material adverse effect on our revenue and gross margin.

Our products involve complexities in both their design and the semiconductor process technology employed in their fabrication. In many cases, the products are also assembled in customized packages or feature high levels of integration. Our products must meet exacting customer specifications for quality, performance and reliability.

Our manufacturing yield, or the percentage of units of a given product in a given period that is usable relative to all such units produced, is a combination of yields including wafer fabrication, assembly and test yields. Due to the complexity of our products, we periodically experience difficulties in achieving acceptable yields as even minor deviations in the manufacturing process can cause substantial manufacturing yield loss or halt production. Our customers may also test our components once they have been assembled into their products. The number of usable products that result from our production process can fluctuate as a result of many factors, including the following:

- design errors;
- defects in photomasks, used to print circuits on wafers;
- minute impurities in materials used;
- contamination of the manufacturing environment;
- equipment failure or variations in the manufacturing processes;
- losses from broken wafers or other human errors;
- defects in packaging; and
- issues and errors in testing.

Typically, for a given level of sales, when our yields improve, our gross margin improves. When our yields decrease, our unit costs are typically higher, our gross margin is lower and our profitability is adversely affected, any or all of which can harm our results of operations and lower our stock price.

We depend on third-party sales representatives and distributors for a material portion of our revenues.

We sell many of our products to customers through independent sales representatives and distributors, as well as through our direct sales force. We are unable to predict the extent to which our independent sales representatives and distributors will be successful in marketing and selling our products. Moreover, many of our independent sales representatives and distributors also market and sell competing products. Our relationships with our representatives and distributors typically may be terminated by either party at any time, and do not require them to buy any of our products. Sales to distributors accounted for approximately 33.3% of our revenue for the fiscal year ended September 27, 2019, and sales to our largest distributor, Richardson, represented 16.1% of our revenue in the same period. If our sales representatives or distributors cease doing business with us or fail to successfully market and sell our products, our ability to sustain and grow our revenue could be materially adversely affected.

Our financial results may be adversely affected by increased tax rates and exposure to additional tax liabilities.

Our effective tax rate is highly dependent upon the geographic composition of our worldwide earnings and tax regulations governing each region, each of which can change from period to period. We are subject to income taxes in both the U.S. and various foreign jurisdictions and significant judgment is required to determine our worldwide tax liabilities. Our effective tax rate as well as the actual tax ultimately payable could be adversely affected by changes in the amount of our earnings attributable to countries with differing statutory tax rates, changes in the valuation of our deferred tax assets, changes in tax laws (or the interpretation of those laws by regulators) or tax rates (particularly in the U.S. or Ireland), increases in non-deductible expenses, the availability of tax credits, material audit assessments or repatriation of non-U.S. earnings, each of which could materially affect our profitability. For example, as of September 27, 2019, we had \$923.4 million of gross federal net operating loss ("NOL") carryforwards, which, for those generated prior to the effective date of the 2017 Tax Cuts and Jobs Act ("Tax Act"), will expire at various dates through 2037, while those generated subsequent to the Tax Act have an indefinite carryforward with no expiration. However, our ability to use these federal NOL carryforwards and other deferred tax assets may be limited and, as a result of our conclusion that recovery of our U.S. deferred tax assets, including those assumed in the AppliedMicro Acquisition, is not considered more likely than not, we established a full valuation allowance against our U.S. deferred tax assets as of September 29, 2017. Any significant increase in our effective tax rates could materially reduce our net income in future periods and decrease the value of your investment in our common stock.

Changes in tax laws and interpretations (including new laws and interpretations) are introduced from time to time to reform taxation in the U.S., Ireland and other countries in which we have operations. Depending on the nature of such changes, if any, these consequences may be significant for us due to the large scale of our international business activities. If any changes are enacted or otherwise implemented, they could have material adverse consequences on the amount of tax we pay and, thereby, on our financial position and results of operations. In addition, on December 22, 2017, the U.S. government enacted the 2017 Tax Cuts and Jobs Act ("Tax Act"). The changes included in the Tax Act are broad and complex, and we are not able to finalize our evaluation of the impact of the Tax Act at this time due to uncertainties related to any future legislative or regulatory actions related to the Tax Act and availability of information needed to perform the final calculations. Accordingly, there is the risk that our use of deferred tax assets valuation allowance as well as our effective tax rate may be adversely affected.

We may make future acquisitions and investments, which involve numerous risks.

We routinely evaluate potential acquisitions, investments and strategic alliances involving complementary technologies, design teams, products and companies. We may pursue such transactions if appropriate opportunities arise. However, we may not be able to identify suitable transactions in the future or if we do identify such transactions, we may not be able to complete them on commercially acceptable terms or at all. We also face intense competition for acquisitions from other acquirers in our industry. These competing acquirers may have significantly greater financial and other resources than us, which may prevent us from successfully pursuing a transaction. In the event we pursue acquisitions, investments, joint ventures and strategic alliances, we will face numerous risks including:

- diversion of management's attention from normal daily operations of our business;
- difficulties in entering markets where competitors have stronger market positions;
- difficulties in improving and integrating the financial reporting capabilities and operating systems of any acquired operations, particularly foreign and formerly private operations, as needed to maintain effective internal control over financial reporting and disclosure controls and procedures;
- loss of any key personnel of the acquired company as well as their know-how, relationships and expertise, which is common following an acquisition;
- maintaining customer, supplier or other favorable business relationships of acquired operations;
- generating insufficient revenue from completed acquisitions, investments, joint ventures and strategic alliances to offset increased expenses associated with any abandoned or completed transactions;
- acquiring material or unknown leasehold, environmental, regulatory, infringement, contractual or other liabilities associated with any acquired operations;
- litigation frequently associated with merger and acquisition transactions; and
- increasing expense associated with amortization or depreciation of intangible and tangible assets we acquire.

Our past transactions required or continue to require significant management time and attention relating to the transaction. Past transactions, whether completed or abandoned by us, have resulted, and in the future may result, in significant costs, expenses, liabilities and charges to earnings. The accounting treatment for any future transaction may result in significant amortizable intangible assets which, when amortized, will negatively affect our consolidated results of operations. The accounting treatment may also result in significant goodwill, which, if impaired, will negatively affect our consolidated results of operations. Furthermore, we may incur debt or issue equity securities to pay for transactions. The incurrence of debt could limit our operating flexibility and be detrimental to our profitability, and the issuance of equity securities would be dilutive to our existing stockholders. Participation in joint ventures and strategic alliances may

limit our ability to realize the full benefit of our technology to the extent that, as a result of such transaction, the future benefit of such technology is shared with our transaction partners. Any or all of the above factors may differ from the investment community's expectations in a given quarter, which could negatively affect our stock price. In addition, as a result of the foregoing, we may not be able to successfully execute transactions in the future to the same extent as we have in the past, if at all.

In the event we make future investments, the investments may decline in value or fail to deliver any strategic benefits we anticipate from them and we may lose all or part of our investment.

We may be unable to successfully integrate the businesses and personnel of our acquired companies and businesses, and may not realize the anticipated synergies and benefits of such acquisitions.

From time to time, we complete acquisitions of companies and certain businesses of companies, and we may not realize the expected benefits from such acquisitions because of integration difficulties or other challenges. The success of our acquisitions will depend, in part, on our ability to realize all or some of the anticipated synergies and other benefits from integrating the acquired businesses with our existing businesses. The integration process may be complex, costly and time-consuming. The potential difficulties we may face in integrating the operations of our acquisitions include, among others:

- failure to implement our business plans for the combined businesses and consolidation or expansion of production capacity as planned and where applicable;
- unexpected losses of key employees, customers or suppliers of our acquired companies and businesses;
- unanticipated issues in conforming our acquired companies' and businesses' standards, processes, procedures and controls with our operations;
- coordinating new product and process development;
- increasing the scope, geographic diversity and complexity of our operations;
- diversion of management's attention from other business concerns;
- adverse effects on our or our acquired companies' and businesses' existing business relationships;
- unanticipated changes in applicable laws and regulations;
- operating risks inherent in our acquired companies' and businesses' business and operations;
- unanticipated expenses and liabilities;
- potential unfamiliarity with our acquired companies and businesses technology, products and markets, which may place us at a competitive disadvantage; and
- other difficulties in the assimilation of our acquired companies and businesses operations, technologies, products and systems.

Our acquired companies and businesses may have unanticipated or larger than anticipated liabilities for patent and trademark infringement claims, violations of laws, commercial disputes, taxes and other known and unknown types of liabilities. There may be liabilities that we underestimated or did not discover in the course of performing our due diligence investigation of our acquired companies and businesses. We may have no recourse or limited recourse under the applicable acquisition-related agreement to recover damages relating to the liabilities of our acquired companies and businesses.

We may not be able to maintain or increase the levels of revenue, earnings or operating efficiency that each of our acquired companies and businesses and us had historically achieved or might achieve separately. In addition, we may not accomplish the integration of our acquired companies and businesses smoothly, successfully or within the anticipated costs or timeframe. If we experience difficulties with the integration process or if the business of our acquired companies or businesses deteriorates, the anticipated cost savings, growth opportunities and other synergies of our acquired companies and businesses may not be realized fully or at all, or may take longer to realize than expected. If any of the above risks occur, our business, financial condition, results of operations and cash flows may be materially and adversely impacted, we may fail to meet the expectations of investors or analysts, and our stock price may decline as a result.

We may experience difficulties in managing any future growth.

To successfully conduct business in a rapidly evolving market, we must effectively plan and manage any current and future growth. Our ability to do so will be dependent on a number of factors, including the following:

- maintaining access to sufficient manufacturing capacity to meet customer demands;
- arranging for sufficient supply of key raw materials and services to avoid shortages or supply bottlenecks;

- building out our administrative infrastructure at the proper pace to support any current and future sales growth while maintaining operating efficiencies;
- adhering to our high quality and process execution standards, particularly as we hire and train new employees and during periods of high volume;
- managing the various components of our working capital effectively;
- upgrading our operational and financial systems, procedures and controls, including improvement of our accounting and internal management systems; and
- maintaining high levels of customer satisfaction.

If we do not effectively manage any future growth, we may not be able to take advantage of attractive opportunities in our markets, our operations may be impacted, and we may experience delays in delivering products to our customers or damaged customer relationships and achieve lower than anticipated revenue and decreased profitability.

We may incur higher than expected expense from or not realize the expected benefits, or any benefits, of consolidation, outsourcing and restructuring initiatives designed to reduce costs and increase revenue across our operations.

We have pursued in the past and may pursue in the future various restructuring initiatives designed to reduce costs and increase revenue across our operations, including reductions in our number of manufacturing facilities, workforce reductions, establishing certain operations closer in location to our global customers and evaluating functions that may be more efficiently performed through outsourcing arrangements. For example, on June 17, 2019, we committed to a restructuring plan designed to streamline and improve our operations. The plan includes the refocusing of certain research and development activities and a reduction in workforce and is expected to provide annual expense savings of approximately \$50.0 million once fully implemented. Our restructuring initiative could result in potential adverse effects on employee capabilities, our continued ability to recruit, hire, retain and motivate highly-skilled engineering, operations, sales, administrative and managerial and other key personnel, our ability to achieve design wins and our ability to maintain and enhance our customer base. Such events could harm our efficiency and our ability to act quickly and effectively in the rapidly changing technology markets in which we sell our products. In addition, we may be unsuccessful in our efforts to realign our organizational structure and shift our investments. The potential negative impact of a restructuring plan on our employees may limit our ability to meet and satisfy the demands of our customers and, as a result, have a material impact on our business, financial condition and results of operations.

Restructuring initiatives can be substantial in scope and disruptive to our operations and they can involve large expenditures. In fiscal years 2019, 2018 and 2017, we incurred restructuring charges of \$19.5 million, \$6.3 million and \$2.7 million, respectively, consisting primarily of employee severance and related costs resulting from reductions in our workforce. Exiting a leased site may involve contractual or negotiated exit payments with the landlord, temporary holding over at an increased lease rate, costs to perform restoration work required by the lease or associated environmental liability, any of which may be material in amount. Consolidation of operations and outsourcing may involve substantial capital expenses and the transfer of manufacturing processes and personnel from one site to another, with resultant startup issues at the receiving site and the need for re-qualification of the transitioned operations with major customers and for ISO or other certifications. We may experience shortages of affected products, delays and higher than expected expenses. Affected employees may be distracted by the transition or may seek other employment, which could cause our overall operational efficiency to suffer. Any of these issues or our failure to realize the expected benefits of these initiatives could harm our results of operations and reduce the price of our common stock.

Our business may be harmed if systems manufacturers choose not to use components made of the compound semiconductor materials we utilize.

Silicon semiconductor technologies are the dominant process technologies for the manufacture of ICs in high-volume, commercial markets and the performance of silicon ICs continues to improve. While we use silicon for some applications, we also often use compound semiconductor technologies such as GaAs, InP, SiGe or GaN to deliver reliable operation at higher power, higher frequency or smaller form factor than a silicon solution has historically allowed. While these compound semiconductor materials offer high-performance features, it is generally more difficult to design and manufacture products with reliability and in volume using them. GaN and InP, in particular, are newer process technologies that do not have as extensive a track record of reliable performance in the field as many of the competing process technologies. Compound semiconductor technology tends to be more expensive than silicon technology due to its above-described challenges and the generally lower volumes at which parts in those processes tend to be manufactured relative to silicon parts for high-volume consumer applications.

System designers in some markets may be reluctant to adopt our non-silicon products or may be likely to adopt silicon products in lieu of our products if silicon products meeting their demanding performance requirements are available, because of:

- their unfamiliarity with designing systems using our products;
- their concerns related to manufacturing costs and yields;

- their unfamiliarity with our design and manufacturing processes; or
- uncertainties about the relative cost effectiveness of our products compared to high-performance silicon components.

We cannot be certain that additional systems manufacturers will design our compound semiconductor products into their systems or that the companies that have utilized our products will continue to do so in the future. Improvements in the performance of available silicon process technologies and solutions could result in a loss of market share on our part. If our products fail to achieve or maintain market acceptance for any of the above reasons, our results of operations will suffer.

The outcome of litigation in which we are involved in is unpredictable and an adverse decision in any such matter could subject us to damage awards and lower the market price of our stock.

From time to time we are a party to litigation matters such as those described in “Item 3 - Legal Proceedings” below. These and any other future disputes, litigations, investigations, administrative proceedings or enforcement actions we may be involved in may divert financial and management resources that would otherwise be used to benefit our operations, result in negative publicity and harm our customer or supplier relationships. Although we intend to contest such matters vigorously, we cannot assure you that their outcome will be favorable to us. An adverse resolution of any such matter in the future, including the results of any amicable settlement, could subject us to material damage awards or settlement payments, loss of contractual or other rights, injunctions or other limitations on the operation of our business or other material harm to our business.

Our limited ability to protect our proprietary information and technology may adversely affect our ability to compete.

Our future success and ability to compete is dependent in part upon our protection of our proprietary information and technology through patent filings, enforcement of agreements related to intellectual property and otherwise. We cannot be certain that any patents we apply for will be issued or that any claims allowed from pending applications will be of sufficient scope or strength to provide meaningful protection or commercial advantage. Our competitors may also be able to design around our patents. Similarly, counterparties to our intellectual property agreements may fail to comply with their obligations under those agreements, requiring us to resort to expensive and time-consuming litigation in an attempt to protect our rights, which may or may not be successful. The laws of some countries in which our products are or may be developed, manufactured or sold, may not protect our products or intellectual property rights to the same extent as U.S. laws, increasing the possibility of piracy of our technology and products. Although we intend to vigorously defend our intellectual property rights, we may not be able to prevent misappropriation of our technology or may need to expend significant financial and other resources in defending our rights.

In addition, we rely on trade secrets, technical know-how and other unpatented proprietary information relating to our product development and manufacturing activities. We try to protect this information by entering into confidentiality agreements with employees and other parties. We cannot be sure that these agreements will be adequate and will not be breached, that we would have adequate remedies for any breach or that our trade secrets and proprietary know-how will not otherwise become known or independently discovered by others.

Additionally, our competitors may independently develop technologies that are substantially equivalent or superior to our technology. Despite our efforts to protect our proprietary rights, unauthorized parties may attempt to copy or otherwise obtain or use our products or technology. Patent litigation is expensive and our ability to enforce our patents and other intellectual property, is limited by our financial resources and is subject to general litigation risks. If we seek to enforce our rights, we may be subject to claims that the intellectual property rights are invalid, are otherwise not enforceable or are licensed to the party against whom we assert a claim. In addition, our assertion of intellectual property rights could result in the other party seeking to assert alleged intellectual property rights of its own against us, which is a frequent occurrence in such litigations.

We face risks associated with government contracting.

Some of our revenue is derived from contracts with agencies of the U.S. government or subcontracts with its prime contractors. As a U.S. government contractor or subcontractor, we may be subject to federal contracting regulations, including the Federal Acquisition Regulations, which govern the allowability of costs incurred by us in the performance of U.S. government contracts. Certain contract pricing is based on estimated direct and indirect costs, which are subject to change. Additionally, the U.S. government is entitled after final payment on certain negotiated contracts to examine all of our cost records with respect to such contracts and to seek a downward adjustment to the price of the contract if it determines that we failed to furnish complete, accurate and current cost or pricing data in connection with the negotiation of the price of the contract.

In connection with our U.S. government business, we may also be subject to government audits and to review and approval of our policies, procedures and internal controls for compliance with procurement regulations and applicable laws. In certain circumstances, if we do not comply with the terms of a contract or with regulations or statutes, we could be subject to downward contract price adjustments or refund obligations or could in extreme circumstances be assessed civil and criminal penalties or be debarred or suspended from obtaining

future contracts for a specified period of time. Any such suspension or debarment or other sanction could have an adverse effect on our business.

Under some of our government subcontracts, we are required to maintain secure facilities and to obtain security clearances for personnel involved in performance of the contract, in compliance with applicable federal standards. Complying with these standards can be both costly and time consuming, and can adversely affect our ability to compete in commercial markets. If we were unable to comply with these requirements or if personnel critical to our performance of these contracts were to lose their security clearances, we might be unable to perform these contracts or compete for other projects of this nature, which could adversely affect our revenue.

We may need to modify our activities or incur substantial costs to comply with environmental laws, and if we fail to comply with environmental laws, we could be subject to substantial fines or be required to change our operations.

We are subject to a variety of international, federal, state and local governmental regulations directed at preventing or mitigating climate change and other environmental harms, as well as to the storage, discharge, handling, generation, disposal and labeling of toxic or other hazardous substances used to manufacture our products. If we fail to comply with these regulations, substantial fines could be imposed on us and we could be required to suspend production, alter manufacturing processes, cease operations or remediate polluted land, air or groundwater, any of which could have a negative effect on our revenue, results of operations and business. Failure to comply with environmental regulations could subject us to civil or criminal sanctions and property damage or personal injury claims. Compliance with current or future environmental laws and regulations could restrict our ability to expand our facilities or build new facilities, or require us to acquire additional expensive equipment, modify our manufacturing processes, or incur other substantial expenses which could harm our business, financial condition and results of operations. In addition, under some of these laws and regulations, we could be held financially responsible for remedial measures if our properties or those nearby are contaminated, even if we did not cause the contamination. We have incurred in the past and may in the future incur environmental liability based on the actions of prior owners, lessees or neighbors of sites we have leased or may lease in the future, third party commercial waste disposal sites we utilize or sites we become associated with due to acquisitions. We cannot predict:

- changes in environmental or health and safety laws or regulations;
- the manner in which environmental or health and safety laws or regulations will be enforced, administered or interpreted;
- our ability to enforce and collect under any indemnity agreements and insurance policies relating to environmental liabilities; or
- the cost of compliance with future environmental or health and safety laws or regulations or the costs associated with any future environmental claims, including the cost of clean-up of currently unknown environmental conditions.

In addition to the costs of complying with environmental, health and safety requirements, we may in the future incur costs defending against environmental litigation brought by government agencies, lessors at sites we currently lease or have been associated with in the past and other private parties. We may be defendants in lawsuits brought by parties in the future alleging environmental damage, personal injury or property damage. A significant judgment or fine levied against us or agreed settlement payment could materially harm our business, financial condition and results of operations. For example, since 1993, MACOM Connectivity Solutions, LLC (formerly known as AppliedMicro) has been named as a potentially responsible party ("PRP") along with more than 100 other companies that used the Omega Chemical Corporation waste treatment facility in Whittier, California (the "Omega Site"). The U.S. Environmental Protection Agency has alleged that the Omega Site failed to properly treat and dispose of certain hazardous waste material. We are a member of a large group of PRPs, known as the Omega Chemical Site PRP Organized Group ("OPOG"), which has agreed to fund certain ongoing remediation efforts at and nearby the Omega Site and with respect to the regional groundwater allegedly contaminated thereby.

Based on currently available information with respect to the total anticipated level of investigatory, remedial and monitoring costs to be incurred by the OPOG and our allocable share of those costs, we have a loss accrual for the Omega Site that is not material. However, the proceedings are ongoing and several factors beyond our control, such as growth in overall remedial costs, insolvency of members of OPOG, or the prosecution of third party contribution or cost recovery actions against OPOG, could cause this loss accrual to prove inadequate. In addition, in 2012, as a result of the PRP group's modification of its liability allocation formulae and the withdrawal of PRP group members from OPOG, our proportional allocation of responsibility among the PRPs increased. Subsequently, certain other PRPs withdrew from OPOG or initiated bankruptcy proceedings, and legal proceedings and settlement negotiations with these parties are continuing. Any future increases to our allocation of responsibility among the PRPs or the future reduction of parties participating in the PRP group could materially increase our potential liability relating to the Omega Site.

Environmental regulations such as the WEEE and RoHS directives limit our flexibility and may require us to incur material expense.

Various countries require companies selling a broad range of electrical equipment to conform to regulations such as the Waste Electrical and Electronic Equipment ("WEEE") and the European Directive 2002/95/EC on Restriction of Hazardous Substances ("RoHS"). New environmental standards such as these could require us to redesign our products in order to comply with the standards, require the development of compliance administration systems or otherwise limit our flexibility in running our business or require us to incur substantial compliance costs. For example, RoHS requires that certain substances be removed from most electronic components. The

WEEE directive makes producers of electrical and electronic equipment financially responsible for specified collection, recycling, treatment and disposal of past and future covered products. We have already invested significant resources into complying with these regimes, and further investments may be required. Alternative designs implemented in response to regulation may be costlier to produce, resulting in an adverse effect on our gross profit margin. If we cannot develop compliant products in a timely fashion or properly administer our compliance programs, our revenue may also decline due to lower sales, which would adversely affect our operating results. Further, if we were found to be non-compliant with any rule or regulation, we could be subject to fines, penalties and/or restrictions imposed by government agencies that could adversely affect our operating results.

Our term loan and revolving credit facility could result in outstanding debt with a claim to our assets that is senior to that of our stockholders and may have other adverse effects on our results of operations.

As of September 27, 2019, we had a credit facility consisting of a term loan facility with an outstanding principle balance of \$673.0 million and a revolving credit facility with \$160.0 million of available borrowing capacity. The facility is secured by a first priority lien on our assets and those of our domestic subsidiaries. The amount of our indebtedness could have important consequences, including the following:

- we may be unable or limited in our ability to obtain additional financing on favorable terms in the future for working capital, capital expenditures, acquisitions, general corporate or other purposes;
- we may be limited in our ability to make distributions to our stockholders in a sale or liquidation until our debt is repaid in full;
- we may be more vulnerable to economic downturns, less able to withstand competitive pressures and less flexible in responding to changing business and economic conditions;
- our cash flow from operations will be allocated to the payment of the principal of and interest on, any outstanding indebtedness; and
- we cannot assure you that our business will generate sufficient cash flow from operations or other sources to enable us to meet our payment obligations under the facility and to fund other liquidity needs.

Our credit facility also contains certain restrictive covenants that may limit or eliminate our ability to, among other things, incur additional debt, sell, lease or transfer our assets, pay dividends, make investments and loans, make acquisitions, guarantee debt or obligations, create liens, enter into transactions with our affiliates, enter into new lines of business and enter into certain merger, consolidation or other reorganizations transactions. These restrictions could limit our ability to withstand downturns in our business or the economy in general or to take advantage of business opportunities that may arise, any of which could place us at a competitive disadvantage relative to our competitors that are not subject to such restrictions. If we breach a loan covenant, the lenders could either refuse to lend funds to us or accelerate the repayment of any outstanding borrowings under the credit facility. We might not have sufficient assets to repay such indebtedness upon a default. If we are unable to repay the indebtedness, the lenders could initiate a bankruptcy proceeding against us or collection proceedings with respect to our subsidiaries securing the facility, which could materially decrease the value of our common stock.

Customer demands and regulations related to “conflict” minerals may force us to incur additional expenses and liabilities.

Pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act, the SEC promulgated rules regarding disclosure and reporting requirements for companies who use “conflict” minerals mined from the Democratic Republic of Congo and adjoining countries in their products. In the semiconductor industry, these minerals are most commonly found in metals used in the manufacture of semiconductor devices and related assemblies. These requirements may adversely affect our ability to source related minerals and metals and increase our related cost. We face difficulties and increased expenses associated with complying with the related disclosure requirements, such as costs related to determining the source of any conflict minerals used in our products. Continued timely reporting is dependent upon the improvement and implementation of new systems and processes and information supplied by our suppliers of products that contain or potentially contain, conflict minerals. Our supply chain is complex and some suppliers may be unwilling to share related confidential information regarding the source of their products or may provide us information that is inaccurate or inadequate. If those risks arise or if our processes in obtaining that information do not fulfill the SEC’s requirements, we may face both reputational challenges and SEC enforcement risks based on our inability to sufficiently verify the origins of the subject minerals and metals or otherwise. More recently, executive orders issued by the President of the United States have increased sanctions in this area as well, which may impact us in the scenarios described above. Moreover, we may encounter challenges to satisfy any related requirements of our customers, which may be different from or more onerous than the requirements of the related SEC rules and executive orders. If we cannot satisfy these customers, they may choose a competitor’s products or may choose to disqualify us as a supplier and we may experience lower than expected revenues or have to write off inventory in the event that it becomes unsalable as a result of these regulations.

We are a holding company and rely on dividends, distributions and other payments, advances and transfers of funds from our subsidiaries to meet our obligations.

As a holding company, we derive substantially all of our cash flow from our subsidiaries. Because we conduct our operations through our subsidiaries, we depend on those entities for dividends and other payments or distributions to meet our operating needs. Legal and contractual restrictions in any existing and future outstanding indebtedness we or our subsidiaries incur may limit our ability to obtain cash from our subsidiaries. The deterioration of the earnings from or other available assets of, our subsidiaries for any reason could limit or impair their ability to pay dividends or other distributions to us.

Our business and operations could suffer in the event of a security breach, cybersecurity incident or disruption of our information technology systems.

We increasingly rely on sophisticated information technology systems throughout our company to keep financial records and business data, employee data, process orders, manage inventory, coordinate shipments to customers, maintain confidential and proprietary information, assist in semiconductor engineering and other technical activities and operate other critical functions such as internet connectivity, network communications and email. We also manage and store various proprietary information and sensitive confidential data related to our business, employees and operations. We maintain a system of controls over the physical security of our facilities. However, our physical facilities and our information technology systems may be susceptible to damage, disruptions or shutdowns due to power outages, hardware failures, telecommunication failures, user errors, catastrophes or other unforeseen events. If we fail to maintain the integrity of our systems or data or if we experience a prolonged disruption in the information technology systems that involve our internal communications or our interactions with customers or suppliers, it could result in the loss of sales and customers and significant incremental costs, which could adversely and materially affect our business.

We may also be subject to security breaches caused by human error, inadequate or outdated software or tools, computer viruses or ransomware, illegal break-ins or hacking, sabotage, misappropriation or acts of vandalism by employees or third parties. Cyber attacks and attempts by others to gain unauthorized access to our information technology systems are becoming more frequent and sophisticated and may be successful. These attempts, which might be related to industrial or other espionage, include covertly introducing malware to our computers and networks, exploiting vulnerabilities in our network infrastructure, or impersonating authorized users, among others. We seek to detect, contain and investigate all security incidents and to prevent their recurrence, but in some cases, we might be unaware of an incident or its magnitude and effects. The theft, unauthorized use or publication of our intellectual property and/or confidential business information of us or third parties could harm our competitive position, reduce the value of our investment in research and development and other strategic initiatives or otherwise adversely affect our business and reputation. To the extent that any security breach impacts the operation of our products in the field or results in inappropriate disclosure of third party confidential information, we may incur liability, governmental sanctions, reputational damage or impaired business relationships as a result, which could harm our business. While we expect to continually invest in additional resources and services to bolster the security of our information technology systems, no amount of investment will eliminate these risks entirely.

Variability in self-insurance liability estimates could adversely impact our results of operations.

We self-insure for employee health insurance and workers' compensation insurance coverage up to a predetermined level, beyond which we maintain stop-loss insurance from a third-party insurer. Our aggregate exposure varies from year to year based upon the number of participants in our insurance plans. We estimate our self-insurance liabilities using an analysis provided by our claims administrator and our historical claims experience. Our accruals for insurance reserves reflect these estimates and other management judgments, which are subject to a high degree of variability. If the number or severity of claims for which we self-insure increases, it could cause a material and adverse change to our reserves for self-insurance liabilities, as well as to our earnings.

We rely on third parties to provide corporate infrastructure services necessary for the operation of our business. Any failure of one or more of our vendors to provide these services could have a material adverse effect on our business.

We rely on third-party vendors to provide critical corporate infrastructure services, including, among other things, certain services related to information technology and network development and monitoring. We depend on these vendors to ensure that our corporate infrastructure will consistently meet our business requirements. The ability of these third-party vendors to successfully provide reliable, high quality services is subject to technical and operational uncertainties that are beyond our control. While we may be entitled to damages if our vendors fail to perform under their agreements with us, our agreements with these vendors limit the amount of damages we may receive. In addition, we do not know whether we will be able to collect on any award of damages or that any such damages would be sufficient to cover the actual costs we would incur as a result of any vendor's failure to perform under its agreement with us. Any failure of our corporate infrastructure could have a material adverse effect on our business, financial condition and results of operations. Upon expiration or termination of any of our agreements with third-party vendors, we may not be able to replace the services provided to us in a timely manner or on terms and conditions, including service levels and cost, that are favorable to us and a transition from one vendor to another vendor could subject us to operational delays and inefficiencies until the transition is complete.

Failure to comply with the General Data Protection Regulation or other data privacy regimes could subject us to significant fines and reputational harm.

Global privacy legislation, enforcement and policy activity are rapidly expanding and creating a complex data privacy compliance environment and the potential for high-profile negative publicity in the event of any data breach. We are subject to many privacy and data protection laws and regulations in the United States and around the world, some of which place restrictions on our ability to process personal data across our business. In particular, the General Data Protection Regulation ("GDPR") is a comprehensive update to the data protection regime in the European Economic Area that is effective as of May 25, 2018. The GDPR imposes new requirements relating to, among other things, consent to process personal data of individuals, the information provided to individuals regarding the processing of their personal data, the security and confidentiality of personal data, and notifications in the event of data breaches and use of third party processors. The GDPR imposes substantial fines for breaches of data protection requirements, which can be up to four percent of the worldwide revenue or 20 million Euros, whichever is greater. We have invested, and continue to invest, human and technology resources into our GDPR compliance efforts and our data privacy compliance efforts generally. These compliance efforts may be time-intensive and costly. Despite those efforts, there is a risk that we may be subject to fines and penalties, litigation and reputational harm if we fail to protect the privacy of third party data or to comply with the GDPR or other applicable regimes.

We may be subject to liabilities based on alleged links between the semiconductor manufacturing process and certain illnesses and birth defects.

In recent years, there has been increased media scrutiny and associated reports regarding a potential link between working in semiconductor manufacturing clean room environments and birth defects and certain illnesses, primarily cancer. Regulatory agencies and industry associations have begun to study the issue to determine if any actual correlation exists. Because we utilize clean rooms, we may become subject to liability claims alleging personal injury. These, and any future, reports or studies may also affect our ability to recruit and retain employees. In addition, a significant judgment against us or material defense costs could harm our reputation, business, financial condition and results of operations.

Our portfolio of marketable securities is significant and subject to market, interest and credit risk that may reduce its value.

We maintain a significant portfolio of marketable securities. Changes in the value of this portfolio could adversely affect our earnings. In particular, the value of our investments may decline due to increases or decreases in interest rates, downgrades of money market funds, commercial paper, U.S. Treasuries and corporate bonds included in our portfolio, instability in the global financial markets that reduces the liquidity of securities included in our portfolio and other factors. Each of these events may cause us to record charges to reduce the carrying value of our investment portfolio or sell investments for less than our acquisition cost.

Risks Relating to Ownership of our Common Stock

We may engage in future capital-raising transactions that dilute the ownership of our existing stockholders or cause us to incur debt.

We may issue additional equity, debt or convertible securities to raise capital in the future. If we do, existing stockholders may experience significant further dilution. In addition, new investors may demand rights, preferences or privileges that differ from or are senior to, those of our existing stockholders. Our incurrence of indebtedness could limit our operating flexibility and be detrimental to our results of operations.

The market price of our common stock may be volatile, which could result in substantial losses for investors.

We cannot predict the prices at which our common stock will trade. The market price of our common stock may fluctuate significantly, depending upon many factors, some of which may be beyond our control. In addition to the risks described in this Annual Report, other factors that may cause the market price of our common stock to fluctuate include:

- changes in general economic, industry and market conditions;
- domestic and international economic factors unrelated to our performance;
- actual or anticipated fluctuations in our quarterly operating results;
- changes in or failure to meet publicly disclosed expectations as to our future financial performance;
- changes in securities analysts' estimates of our financial performance or lack of research and reports by industry analysts;
- changes in market valuations or earnings of similar companies;
- changes in investor perception of us and the industry in which we operate;
- addition or loss of significant customers;

- announcements by us or our competitors, customers or suppliers of significant products, contracts, acquisitions, strategic partnerships or other events;
- developments or disputes concerning patents or proprietary rights, including any injunction issued or material sums paid for damage awards, settlement payments, license fees, attorney's fees or other litigation expenses associated with intellectual property lawsuits we may initiate, or in which we may be named as defendants;
- failure to complete significant sales or to win a competitive selection process;
- developments concerning current or future strategic alliances or acquisitions;
- any future sales of our common stock or other securities; and
- additions or departures of directors, executives or key personnel.

For example, on August 1, 2017 we announced results of operations for our third quarter of fiscal year 2017 and a financial outlook for our fourth quarter of fiscal year 2017 that were below the then-current consensus of securities analyst expectations. The closing price per share of our common stock thereafter declined from \$61.06 on August 1, 2017 to \$45.50 on August 2, 2017, and further to \$39.67 on August 18, 2017, representing a cumulative decline of approximately 35.0%. Furthermore, the stock markets recently have experienced price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political, and market conditions such as recessions, interest rate changes or international currency fluctuations, may negatively impact the market price of our common stock. In the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

If securities or industry analysts do not publish research or reports about our business or publish negative reports about our business, our stock price and trading volume could decline.

The trading market for our common stock may depend on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. If one or more of the analysts who cover us downgrade our common stock or change their opinion of our common stock, our stock price would likely decline. If one or more of these analysts cease their coverage of us or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our stock price or trading volume to decline.

Our common stock price may decline if a substantial number of shares are sold in the market by our stockholders.

Future sales of substantial amounts of shares of our common stock by our existing stockholders in the public market, or the perception that these sales could occur, may cause the market price of our common stock to decline. Increased sales of our common stock in the market for any reason could exert significant downward pressure on our stock price. These sales also might make it more difficult for us to sell equity or equity-related securities in the future at a time and price we deem appropriate.

If we fail to maintain effective internal controls over financial reporting, we may not be able to accurately report our financial results, which could have a material adverse effect on our operations, investor confidence in our business and the trading prices of our securities.

We are required to maintain disclosure controls and procedures and internal controls over financial reporting that are effective for the purposes described in "Item 9A.- Controls and Procedures" below.

The existence of a material weakness in our internal controls may adversely affect our ability to record, process, summarize and report financial information timely and accurately and, as a result, our financial statements may contain material misstatements or omissions, which could result in regulatory scrutiny, cause investors to lose confidence in our reported financial condition and otherwise have a material adverse effect on our business, financial condition, cash flow results of operations or the trading price of our stock.

Some of our stockholders can exert control over us and they may not make decisions that reflect our interests or those of other stockholders.

Our largest stockholders control a significant amount of our outstanding common stock. As of September 27, 2019, John and Susan Ocampo beneficially owned 30.0% of our common stock. As a result, these stockholders will be able to exert a significant degree of influence over our management and affairs and control over matters requiring stockholder approval, including the election of our directors and approval of significant corporate transactions. In addition, this concentration of ownership may delay or prevent a change in control of us and might affect the market price of our securities. In addition, the interests of these stockholders may not always coincide with your interests or the interests of other stockholders.

Anti-takeover provisions in our charter documents and Delaware law could prevent or delay a change in control of our company that stockholders may consider beneficial and may adversely affect the price of our stock.

Provisions of our fifth amended and restated certificate of incorporation and third amended and restated bylaws may discourage, delay or prevent a merger, acquisition or change of control that a stockholder may consider favorable. These provisions could also discourage proxy contests and make it more difficult for stockholders to elect directors and take other corporate actions. The existence of these provisions could limit the price that investors might be willing to pay in the future for shares of our common stock. These provisions include authorization of the issuance of "blank check" preferred stock, staggered elections of directors and advance notice requirements for nominations for election to the board of directors and for proposing matters to be submitted to a stockholder vote. Provisions of Delaware law may also discourage, delay or prevent someone from acquiring or merging with our company or obtaining control of our company. Specifically, Section 203 of the Delaware General Corporate Law may prohibit business combinations with stockholders owning 15% or more of our outstanding voting stock. Our board of directors could rely on Delaware law to prevent or delay an acquisition of us and this reliance could reduce our value.

We do not intend to pay dividends for the foreseeable future.

We do not intend to pay any cash dividends on our common stock in the foreseeable future. The payment of cash dividends is restricted under the terms of the agreements governing our indebtedness. In addition, because we are a holding company, our ability to pay cash dividends may be limited by restrictions on our ability to obtain sufficient funds through dividends from subsidiaries, including restrictions under the terms of the agreements governing our indebtedness. We anticipate that we will retain all of our future earnings for use in the development of our business and for general corporate purposes. Any determination to pay dividends in the future will be at the discretion of our board of directors. Accordingly, investors must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any future gains on their investments.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 2. PROPERTIES.

Our principal executive offices are located in a leased facility in Lowell, Massachusetts. We also maintain leased facilities for our design centers located in California, North Carolina, New York, Oregon, Michigan, New Jersey, Pennsylvania, Canada, Taiwan, Ireland, France and China as well as for our administrative, assembly and test operations located in California, New Hampshire, and Taiwan, and our local sales offices in California, North Carolina, Ireland, Canada, China, Taiwan, Japan and India. We believe that our leased facilities are adequate for our present operations. In addition to our corporate headquarters facility the following is a list of our main leased facilities and their primary functions.

Site	Major Activity ⁽¹⁾	Square Footage	Lease Expiration
Lowell, Massachusetts	A, P&F, T&A, AE and RT	281,700	October 2038
Newport Beach, California	A, R&D, A&E and S&M	68,435	December 2029
Ithaca, New York	R&D and T&A	20,600	December 2025
Cork, Ireland	A, R&D, S&M, AE and RT	21,422	August 2026
Santa Clara, California	A, R&D, A&E	59,625	October 2024
Nashua, New Hampshire	R&D, T&A, P&F, RT	17,000	December 2021
Ann Arbor, Michigan	A, P&F, R&D and T&A, RT	50,335	May 2021

(1) Major activities include Administration (A), Research and Development (R&D), Production and Fabrication (P&F), Sales and Marketing (S&M), Application Engineering (AE), Test and Assembly (T&A) and Reliability Testing (RT).

For additional information regarding property, plant and equipment by geographic region for each of the last two fiscal years, see the Notes to Consolidated Financial Statements in "Item 8. - Financial Statements and Supplementary Data" below.

ITEM 3. LEGAL PROCEEDINGS.

From time to time we may be subject to commercial and employment disputes, claims by other companies in the industry that we have infringed their intellectual property rights and other similar claims and litigations. Any such claims may lead to future litigation and material damages and defense costs. Other than as set forth below, we were not involved in any pending legal proceedings as of the filing date of this Annual Report that we believe would have a material adverse effect on our business, operating results, financial condition or cash flows.

Certain legal proceedings in which we are involved, if any, are discussed in Note 14 - Commitments and Contingencies to our Consolidated Financial Statements included in this Annual Report which is incorporated by reference herein.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

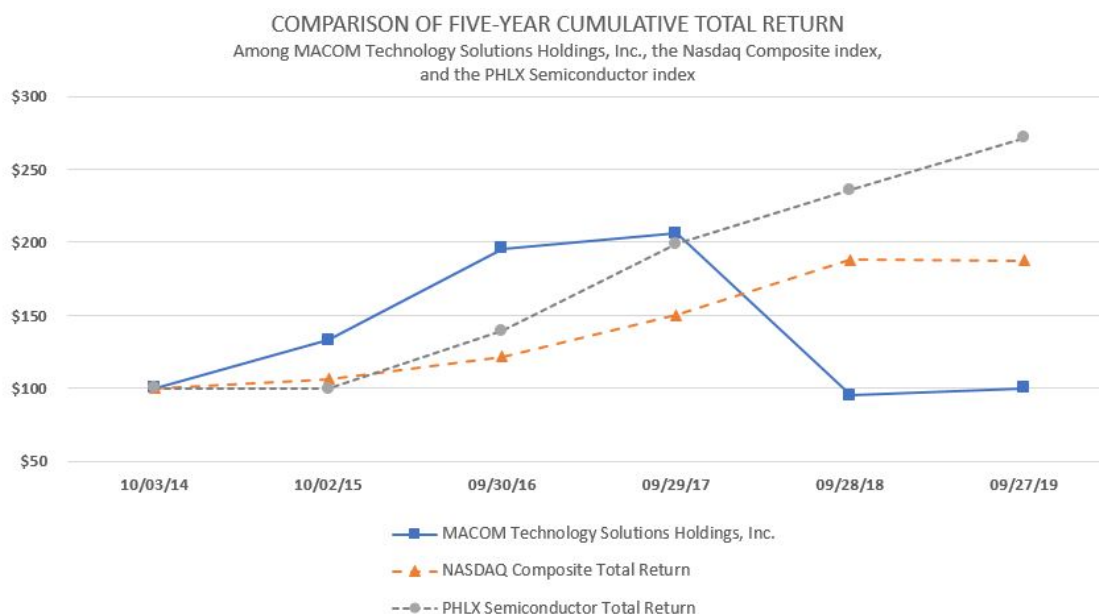
PART II

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

Our common stock has been listed on the Nasdaq Global Select Market under the symbol "MTSI" since March 15, 2012. The number of stockholders of record of our common stock as of November 21, 2019 was approximately 16. The number of stockholders of record does not include beneficial owners whose shares are held by nominees in street name.

Stock Price Performance Graph

The following graph shows a comparison from October 3, 2014 through September 27, 2019 of the total cumulative return of our common stock with the total cumulative return of the NASDAQ Composite Index and the PHLX Semiconductor Index. The amounts represented below assume an investment of \$100.00 in our common stock at the closing price of \$21.63 on October 3, 2014 and in the Nasdaq Composite Index and the PHLX Semiconductor Index on the closest month end date of October 3, 2014, and assume reinvestment of dividends. The comparisons in the graph are historical and are not intended to forecast or be indicative of possible future performance of our common stock.



	October 3, 2014	October 2, 2015	September 30, 2016	September 29, 2017	September 28, 2018	September 27, 2019
MACOM Technology Solutions Holdings, Inc.	\$100.00	\$133.01	\$195.75	\$206.24	\$95.24	\$100.23
Nasdaq Composite Index	\$100.00	\$106.40	\$121.55	\$150.34	\$188.18	\$187.75
PHLX Semiconductor Index	\$100.00	\$99.42	\$139.29	\$198.64	\$235.77	\$271.56

Issuer Purchases of Equity Securities

Period	Total Number of Shares (or Units) Purchased (1)	Average Price Paid per Share (or Unit)	Total Number of Shares (or Units) Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximate Dollar Value) of Shares (or Units) that May Yet Be Purchased Under the Plans or Programs
June 29, 2019—July 26, 2019	12,139	\$ 15.63	—	—
July 27, 2019—August 23, 2019	3,879	19.52	—	—
August 24, 2019—September 27, 2019	—	—	—	—
Total	16,018	\$ 16.57	—	—

- (1) Our board of directors has approved "withhold to cover" as a tax payment method for vesting of restricted stock awards for our employees. Pursuant to an election for "withhold to cover" made by our employees in connection with the vesting of such awards, all of which were outside of a publicly-announced repurchase plan, we withheld from such employees the shares noted in the table above to cover tax withholding.

related to the vesting of their awards. The average prices listed in the above table are averages of the fair market prices at which we valued shares withheld for purposes of calculating the number of shares to be withheld.

ITEM 6. SELECTED FINANCIAL DATA.

You should read the following selected financial data in conjunction with our consolidated financial statements and related notes, as well as "Item 1A - Risk Factors" and "Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations" appearing elsewhere in this Annual Report.

We derived (i) the Statements of Operations data for the fiscal years 2019, 2018 and 2017, and (ii) the Balance Sheet data as of September 27, 2019 and September 28, 2018, from our audited consolidated financial statements, which appear elsewhere in this Annual Report. We derived the Statements of Operations data for the fiscal years 2016 and 2015 and Balance Sheet data as of September 29, 2017, September 30, 2016 and October 2, 2015 from our audited consolidated financial statements, adjusted for discontinued operations, which do not appear elsewhere in this Annual Report. We have a 52-or 53-week fiscal year ending on the Friday closest to September 30.

The historical results presented below are not necessarily indicative of financial results to be achieved in future periods.

	Fiscal Years				
	2019	2018	2017	2016	2015
	(in thousands, except per share data)				
Statements of Operations Data (1):					
Revenue	\$ 499,708	\$ 570,398	\$ 698,772	\$ 544,338	\$ 420,609
Gross profit	220,708	245,706	326,884	281,609	203,590
(Loss) income from operations	(380,376)	(106,520)	(16,084)	13,248	10,092
Loss before income taxes	(423,153)	(155,235)	(49,505)	(21,571)	(15,400)
Income tax (benefit) expense	(39,355)	(21,473)	100,911	(17,983)	(9,858)
Loss from continuing operations	(383,798)	(133,762)	(150,416)	(3,588)	(5,542)
(Loss) income from discontinued operations	—	(6,215)	(19,077)	5,022	54,131
Net (loss) income attributable to common stockholders	\$ (383,798)	\$ (139,977)	\$ (169,493)	\$ 1,434	\$ 48,589
Basic (loss) income per common share:					
Loss from continuing operations	\$ (5.84)	\$ (2.07)	\$ (2.48)	\$ (0.07)	\$ (0.11)
(Loss) income from discontinued operations	—	(0.10)	(0.31)	0.09	1.06
Net (loss) income - basic	\$ (5.84)	\$ (2.16)	\$ (2.79)	\$ 0.03	\$ 0.95
Diluted (loss) income per common share:					
Loss from continuing operations	\$ (5.84)	\$ (2.47)	\$ (2.48)	\$ (0.07)	\$ (0.11)
(Loss) income from discontinued operations	—	(0.10)	(0.31)	\$ 0.09	\$ 1.06
Net (loss) income - diluted	\$ (5.84)	\$ (2.57)	\$ (2.79)	\$ 0.03	\$ 0.95
Shares used to compute net (loss) income per common share:					
Basic	65,686	64,741	60,704	53,364	51,146
Diluted	65,686	65,311	60,704	53,364	51,146
	As of				
	September 27, 2019	September 28, 2018	September 29, 2017	September 30, 2016	October 2, 2015
Consolidated Balance Sheet Data (in thousands):					
Cash and cash equivalents	\$ 75,519	\$ 94,676	\$ 130,104	\$ 332,977	\$ 122,312
Working capital	323,746	351,856	445,778	520,794	312,743
Total assets	1,105,574	1,482,495	1,637,123	1,188,551	860,834
Long-term debt and capital leases, less current portion	684,778	687,395	678,746	576,345	335,087
Stockholders' equity	\$ 313,896	\$ 668,675	\$ 777,374	\$ 462,784	\$ 424,533

(1) See Results of Operations in *Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations* and Consolidated Statements of Operations and our Notes to Consolidated Financial Statements for additional information for fiscal years 2019, 2018 and 2017 in *Item 8 - Financial Statements and Supplementary Data*.

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and related notes that appear elsewhere in this Annual Report. In addition to historical information, the following discussion contains forward-looking statements that are subject to risks and uncertainties. Actual results may differ substantially and adversely from those referred to herein due to a number of factors, including but not limited to those described below and in "Item 1A - Risk Factors" and elsewhere in this Annual Report.

OVERVIEW

We design and manufacture semiconductor products for Data Center, Telecommunications and Industrial and Defense applications. Headquartered in Lowell, Massachusetts, we have more than 65 years of application expertise, with silicon, gallium arsenide and indium phosphide fabrication, manufacturing, assembly and test, and operational facilities throughout North America, Europe and Asia. We design, develop and manufacture differentiated, high-value products for customers who demand high performance, quality and reliability. We offer a broad portfolio of thousands of standard and custom devices, which include integrated circuits ("IC"), multi-chip modules ("MCM"), diodes, amplifiers, switches and switch limiters, passive and active components and complete subsystems, across dozens of product lines serving over 8,000 end customers in three primary markets. Our semiconductor products are electronic components that our customers incorporate into their larger electronic systems, such as, wireless basestations, high capacity optical networks, radar, medical systems and test and measurement. Our primary markets are: (1) Telecom, which includes carrier infrastructure like long-haul/metro, 5G and FTTx/PON; (2) Data Centers, enabled by our broad portfolio of analog ICs and photonic components for high speed optical module customers; and (3) I&D, which includes military and commercial radar, RF jammers, electronic countermeasures, communication data links, satellite communications and multi-market applications, which include industrial, medical, test and measurement and scientific applications.

See "Item 1 - Business" for additional information.

Basis of Presentation

We have one reportable operating segment and all intercompany balances have been eliminated in consolidation.

We have a 52 or 53-week fiscal year ending on the Friday closest to the last day of September with fiscal years 2019, 2018 and 2017 each consisting of 52 weeks. To offset the effect of holidays, for fiscal years in which there are 53 weeks, we typically include the extra week in the first quarter of our fiscal year.

Description of Our Revenue

Revenue. Substantially all of our revenue is derived from sales of high-performance RF, microwave and millimeterwave semiconductor products. We design, integrate, manufacture and package differentiated product solutions that we sell to customers through our direct sales organization, our network of independent sales representatives and distributors.

We believe the primary drivers of our future revenue growth will include:

- engaging early with our lead customers to develop custom and standard products and solutions that can be driven across multiple growth markets;
- leveraging our core strength and leadership position in standard, catalog products that service all of our end applications;
- increasing content of our semiconductor solutions in our customers' systems through cross-selling our dozens of product lines;
- introducing new products through internal development and acquisitions with market reception that command higher prices based on the application of advanced technologies, added features, higher levels of integration and improved performance; and
- continued growth in the demand for high-performance analog and optical semiconductors in our three primary markets in particular.

Our core strategy is to develop and innovate high-performance products that address our customers' most difficult technical challenges in our primary markets: Data Center, Telecom and I&D. While sales in any or all of our primary markets may slow or decline from period to period, over the long-term we generally expect to benefit from our strength in these markets.

We expect our revenue in the Data Center market to be driven by the adoption of cloud-based components and the migration to an application centric architecture, which we expect will drive adoption of higher speed optical and photonic components.

We expect our revenue in the Telecom market to be driven by 5G, with continued upgrades and expansion of communications equipment to support mobile computing devices such as smartphones and tablets, increasing adoption of our high performance RF, millimeterwave, optical and photonic components.

We expect our revenue in the I&D market to be driven by the broad product portfolio we offer that services applications such as test and measurement, satellite communications, civil and military radar, industrial, scientific and medical applications. Growth in this market is subject to changes in governmental programs and budget funding, which is difficult to predict. We expect revenue in this market to be further supported by growth in applications for our multi-market catalog products.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements. The preparation of financial statements, in conformity with generally accepted accounting principles ("GAAP") in the U.S., requires management to make estimates and judgments that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. By their nature, these estimates and judgments are subject to an inherent degree of uncertainty and could be material if our actual or expected experience were to change unexpectedly. On an ongoing basis, we re-evaluate our estimates and judgments.

We base our estimates and judgments on our historical experience and on other assumptions that we believe are reasonable under the circumstances, the results of which form the basis for making the judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results could differ from those estimates and material effects on our operating results and financial position may result. The accounting policies which our management believes involve the most significant application of judgment or involve complex estimation, are inventories and associated reserves; goodwill and intangibles asset valuations and associated impairment assessments; revenue reserves; warranty reserves; share-based compensation valuations and income taxes.

When we evaluate inventory for excess quantities and obsolescence, we utilize historical product usage experience and expected demand for establishing our reserve estimates. Our actual product usage may vary from the historical experience and estimating demand is inherently difficult, particularly given the cyclical nature of the semiconductor industry, both of these factors may result in us recording excess and obsolete inventory amounts that do not match the required amounts.

Our goodwill impairment assessment requires management to make assumptions and to apply judgment to items such as the determination of the reporting unit.

We apply significant estimates and judgments in order to determine the fair value of the identified tangible and intangible assets acquired, liabilities assumed and goodwill recognized in business combinations. The value of all assets and liabilities are recognized at fair value as of the acquisition date using a market participant approach. In measuring the fair value, we utilize a number of valuation techniques. The valuation of the identifiable assets and liabilities includes assumptions such as projected revenue, royalty rates, weighted average cost of capital, discount rates and estimated useful lives. These assessments can be significantly affected by our judgments.

Significant management judgment is required in our valuation of long-lived asset groups when assessing for potential impairment. These analyses are based on the creation of forecasts of future operating results that are used in the valuation, including estimation of (i) future cash flows, (ii) the long-term rate of growth for our business, (iii) the useful life over which cash flows will occur, (iv) terminal values, if applicable and (v) the determination of our weighted average cost of capital, which is used to determine the discount rate. It is possible that these forecasts may change and our projections included in our forecasts of future results may prove to be inaccurate. If our actual results, or the forecasts and estimates used in future impairment analyses, are lower than the original estimates used to assess the recoverability of these assets, we could incur impairment charges. Our forecasts could be adversely affected by, but not limited to, a change in strategy, the outcome of development activities or slowdown in our primary markets. The value of our long-lived asset groups could also be impacted by future adverse changes such as a decline in the valuation of technology company stocks, including the valuation of our common stock, or a significant slowdown in the worldwide economy or in the semiconductor industry.

We establish revenue reserves, primarily for distributor price adjustments, which requires the use of judgment and estimates that impact the amount and timing of revenue recognition. We record reductions of revenue for such distributor pricing adjustments in the same period that the related revenue is recorded based on estimates of historical pricing adjustments granted to distributors. The actual pricing adjustments granted to distributors may significantly exceed or be less than the historical estimates resulting in adjustments to revenue in the incorrect period.

We establish a product warranty liability at the time of revenue recognition. Product warranties generally have terms of twelve months and cover nonconformance with specifications and defects in material or workmanship. For sales to distributors, our warranty generally begins when the product is resold by the distributor. The liability is based on estimated costs to fulfill customer product warranty obligations and utilizes historical product failure rates. Should actual warranty obligations differ from estimates, revisions to the warranty liability may be required.

We account for share-based compensation arrangements using the fair value method as described in *Note 2 - Summary of Significant Accounting Policies* to our Consolidated Financial Statements in this Annual Report. There are a significant number of estimates and assumptions required for the initial valuation as well as for the ongoing valuation of certain share-based compensation items. These estimates may vary significantly and the assumptions may not be accurate resulting us to make adjustments to historically recorded balances.

We are required to estimate our income taxes in each of the jurisdictions in which we operate. This process involves estimating our actual current tax exposure together with assessing temporary differences resulting from differing treatment of items for tax and accounting purposes. These differences result in deferred tax assets and liabilities, which are included within our consolidated balance sheets. We then assess the likelihood that our deferred tax assets will be recovered from future taxable income within the relevant jurisdiction and to the extent we believe that recovery is not likely, we must establish a valuation allowance. We provided valuation allowances for certain of our deferred tax assets, where it is more likely than not that some portion, or all of such assets, will not be realized.

The application of tax laws and regulations to calculate our tax liabilities is subject to legal and factual interpretation, judgment, and uncertainty in a multitude of jurisdictions. Tax laws and regulations themselves are subject to change as a result of changes in fiscal policy, changes in legislation, the evolution of regulations, and court rulings. We recognize potential liabilities for anticipated tax audit issues in the United States and other tax jurisdictions based on our estimate of whether, and the extent to which, additional taxes and interest will be due. We record an amount as an estimate of probable additional income tax liability at the largest amount that we feel is more likely than not, based upon the technical merits of the position, to be sustained upon audit by the relevant tax authority.

Historically, we have not experienced material differences in our estimates and actual results.

For additional information related to these and other accounting policies refer to *Note 2 - Summary of Significant Accounting Policies* to our Consolidated Financial Statements included in this Annual Report which is incorporated by reference herein.

RESULTS OF OPERATIONS

As discussed in Note 23 - *Divested Businesses and Discontinued Operations* to our Consolidated Financial Statements included in this Annual Report, we have adjusted certain amounts associated with discontinued operations in our results of operations, cash flows and assets and liabilities for all periods presented.

The following table sets forth, for the periods indicated, our Statements of Operations data (in thousands):

	Fiscal Years		
	2019	2018	2017
Revenue	\$ 499,708	\$ 570,398	\$ 698,772
Cost of revenue ^{(1) (4) (7)}	279,000	324,692	371,888
Gross profit	220,708	245,706	326,884
Operating expenses:			
Research and development ⁽¹⁾	163,469	177,713	147,986
Selling, general and administrative ^{(1) (3) (5) (8)}	153,286	161,673	187,886
Impairment charges ⁽⁷⁾	264,786	6,575	4,352
Restructuring charges ⁽⁹⁾	19,543	6,265	2,744
Total operating expenses	601,084	352,226	342,968
Loss from operations	(380,376)	(106,520)	(16,084)
Other (expense) income:			
Warrant liability gain (expense) ⁽²⁾	765	27,646	(2,522)
Interest expense	(35,803)	(31,338)	(28,855)
Other expense, net ^{(6) (10)}	(7,739)	(45,023)	(2,044)
Other expense, net	(42,777)	(48,715)	(33,421)
Loss before income taxes	(423,153)	(155,235)	(49,505)
Income tax (benefit) expense	(39,355)	(21,473)	100,911
Loss from continuing operations	(383,798)	(133,762)	(150,416)
Loss from discontinued operations ^{(5) (6)}	—	(6,215)	(19,077)
Net loss	\$ (383,798)	\$ (139,977)	\$ (169,493)

(1) Includes (a) Amortization expense related to intangible assets arising from acquisitions and (b) Share-based compensation expense included in our Consolidated Statements of Operations as set forth below (in thousands):

	Fiscal Years		
	2019	2018	2017
(a) Intangible amortization expense:			
Cost of revenue	\$ 29,847	\$ 33,429	\$ 30,286
Selling, general and administrative	44,872	48,265	35,456
(b) Share-based compensation expense:			
Cost of revenue	2,936	3,869	3,189
Research and development	8,551	13,448	10,565
Selling, general and administrative	12,305	14,620	22,581

(2) Represents changes in the fair value of common stock warrants recorded as liabilities and adjusted each reporting period to fair value.

(3) Includes specific litigation costs of \$0.2 million, \$3.5 million and \$2.3 million incurred in fiscal years 2019, 2018 and 2017, respectively, primarily related to a now settled lawsuit against Infineon Technologies Americas Corporation and Infineon Technologies AG.

(4) In fiscal years 2018 and 2017, includes approximately \$0.2 million and \$43.2 million, respectively, of costs for step-up in valuation of acquired business inventories to fair value.

(5) Includes change in control payments associated with the AppliedMicro Acquisition of \$21.3 million for fiscal year 2017, of which \$12.0 million was recorded as selling, general and administrative expenses and \$9.3 million was recorded as discontinued operations.

(6) See Note 23 - *Divested Business and Discontinued Operations* to the Consolidated Financial Statements included in this Annual Report for additional information.

- (7) Impairment charges in fiscal year 2019 include \$264.8 million for impairment of customer relationship and acquired technology intangible assets as well as equipment. In fiscal year 2018, impairment charges include \$6.6 million related to property and equipment and other assets designated for future use with ZTE, and cost of revenue includes \$2.5 million related to inventory designated for future sale to ZTE. Additionally, cost of revenue includes inventory charges of \$17.2 million associated with certain production and product line exits during fiscal year 2018. Impairment related charges of \$4.4 million during fiscal year 2017 related to the revaluation of in-process research and development ("IPR&D") technology placed in service during the fiscal year. See *Note 17 - Impairments* to the Consolidated Financial Statements included in this Annual Report for additional information.
- (8) Includes acquisition and transaction related costs of \$10.9 million associated with the AppliedMicro Acquisition during fiscal year 2017.
- (9) See *Note 15 - Restructurings*, to the Consolidated Financial Statements included in the Annual Report for additional information.
- (10) Includes \$7.5 million and \$10.4 million of losses for fiscal years 2019 and 2018, respectively, associated with our equity method investment in Compute based on our proportionate share of the losses of Compute, as well as a \$34.3 million loss on disposal of the LR4 business in fiscal year 2018. See *Note 5 - Investments*, *Note 23 - Divested Business and Discontinued Operations* and *Note 25 - Supplemental Cash Flow Information* to the Consolidated Financial Statements included in this Annual Report for additional information.

The following table sets forth, for the periods indicated, our Statements of Operations data expressed as a percentage of our revenue:

	Fiscal Years		
	2019	2018	2017
Revenue	100.0 %	100.0 %	100.0 %
Cost of revenue	55.8	56.9	53.2
Gross profit	44.2	43.1	46.8
Operating expenses:			
Research and development	32.7	31.2	21.2
Selling, general and administrative	30.7	28.3	26.9
Impairment charges	53.0	1.2	0.6
Restructuring charges	3.9	1.1	0.4
Total operating expenses	120.3	61.8	49.1
Loss from operations	(76.1)	(18.7)	(2.3)
Other (expense) income:			
Warrant liability gain (expense)	0.2	4.8	(0.4)
Interest expense, net	(7.2)	(5.5)	(4.1)
Other expense	(1.5)	(7.9)	(0.3)
Total other expense, net	(8.6)	(8.5)	(4.8)
Loss before income taxes	(84.7)	(27.2)	(7.1)
Income tax (benefit) expense	(7.9)	(3.8)	14.4
Loss from continuing operations	(76.8)	(23.5)	(21.5)
Loss from discontinued operations	—	(1.1)	(2.7)
Net loss	(76.8)%	(24.5)%	(24.3)%

Comparison of Fiscal Year Ended September 27, 2019 to Fiscal Year Ended September 28, 2018

Revenue. In fiscal year 2019, our revenue decreased by \$70.7 million, or 12.4%, to \$499.7 million from \$570.4 million for fiscal year 2018.

Revenue from our primary markets, the percentage of change between the years and revenue by primary markets expressed as a percentage of total revenue were (in thousands, except percentages):

	Fiscal Years		
	2019	2018	% Change
Telecom	\$ 180,938	\$ 222,940	(18.8)%
Data Center	114,132	162,098	(29.6)%
Industrial & Defense	204,638	185,360	10.4 %
Total	\$ 499,708	\$ 570,398	(12.4)%
Telecom	36.2%	39.1%	
Data Center	22.8%	28.4%	
Industrial & Defense	41.0%	32.5%	
Total	100.0%	100.0%	

In fiscal year 2019, our Telecom market revenue decreased by \$42.0 million, or 18.8%, compared to fiscal year 2018. The decrease was primarily due to the full year effect of our May 2018 sale of the Japan-based long-range optical subassembly business (the "LR4

Business"), lower sales of carrier-based optical semiconductor products to our Asia customer base, as well as lower sales of products targeting fiber to the home applications.

In fiscal year 2019, our Data Center market revenue decreased by \$48.0 million, or 29.6%, compared to fiscal year 2018. The decrease was primarily due to lower revenue related to sales of legacy optical products and lasers, partially offset by the recognition of \$7.0 million of licensing revenue during the fiscal year ended September 27, 2019.

In fiscal year 2019, our I&D market revenues increased by \$19.3 million, or 10.4%, compared to fiscal year 2018. The increase was related to higher revenue from sales across the product portfolio.

Gross profit. In fiscal year 2019, our gross profit decreased by \$25.0 million, or 10.2%, compared to fiscal year 2018. Gross margin of 44.2% in fiscal year 2019 increased 110 basis points, compared to fiscal year 2018. Gross profit during 2019 was primarily impacted by lower fiscal year 2019 revenue, lower gross profit as a result of the May 2018 sale of our LR4 Business and higher inventory reserves primarily associated with Data Center products, partially offset by the recognition of \$7.0 million of licensing revenue during fiscal year 2019.

Research and development. In fiscal year 2019, research and development expense decreased by \$14.2 million, or 8.0%, to \$163.5 million representing 32.7% of revenue, compared with \$177.7 million, or 31.2% of revenue in fiscal year 2018. Research and development expense decreased in the 2019 period primarily as a result of lower compensation-related costs, lower share-based compensation, as well the closure of certain design facilities associated with restructuring actions. Research and development expense increased as a percentage of revenue due to the decrease in net revenue during fiscal year 2019.

Selling, general and administrative. In fiscal year 2019, selling, general and administrative expenses decreased by \$8.4 million, or 5.2% to \$153.3 million, or 30.7% of revenue, compared with \$161.7 million, or 28.3% of revenue, for fiscal year 2018. Selling, general and administrative expenses decreased in the fiscal year 2019 period primarily due to lower share-based compensation, lower amortization expense, and lower other compensation-related costs as a result of restructuring actions. Selling, general and administrative expense increased as a percentage of revenue due to the decrease in net revenue during fiscal year 2019.

Impairment charges. In fiscal year 2019 impairment charges were \$264.8 million, or 53.0% of revenue, primarily related to the \$257.0 million impairment of intangible assets, as well as the impairment of \$7.1 million impairment of equipment from construction in process that will not be placed in service. See *Note 17 - Impairments* to the Consolidated Financial Statements included in this Annual Report for additional information.

Restructuring charges. In fiscal year 2019, restructuring charges were \$19.5 million, or 3.9% of our revenue, compared with \$6.3 million, or 1.1% of our revenue, for fiscal year 2018. During the fiscal quarter ended June 28, 2019, we committed to a plan to strategically realign, streamline and improve certain of our business and operations, including reducing our workforce by approximately 250 employees or 20% and exiting seven development facilities in France, Japan, the Netherlands, Florida, Massachusetts, New Jersey and Rhode Island. We also committed to reducing certain development activities for one of our product lines, and will no longer invest in the design and development of optical modules and subsystems for Data Center applications. We incurred restructuring charges of \$11.6 million in fiscal year 2019 under this plan, including \$6.3 million of employee-related costs, \$4.0 million of impairment of fixed assets and \$1.3 million of other costs. We expect to incur restructuring costs of approximately \$2.5 million to \$3.4 million through fiscal year 2020 as we complete this restructuring action, which primarily consists of \$2.6 million of employee related costs and \$0.8 million of facility-related costs. We expect annual expense savings of approximately \$50 million dollars, primarily in research and development expenses, once this plan is fully implemented.

During the fiscal quarter ended March 29, 2019, we committed to a plan to exit certain design facilities and activities ("Design Facilities Plan"). We incurred restructuring charges of \$2.5 million in fiscal year 2019 under this plan, which primarily consists of \$0.3 million of employee-related costs and \$2.2 million of facility-related costs. We do not expect to incur further restructuring costs for the Design Facilities Plan.

During the fiscal quarter ended September 28, 2018, we committed to a plan to exit certain production and product lines, primarily related to certain production facilities located in Ithaca, New York ("Ithaca Plan"). For these facilities, we incurred restructuring charges of \$5.5 million in fiscal year 2019, including \$1.5 million of employee-related costs and \$4.0 million of facility-related costs. We do not expect to incur further restructuring costs for the Ithaca Plan.

Refer to *Note 15 - Restructurings* in this Annual report on Form 10-K for additional information.

Warrant liability gain. In fiscal year 2019, we recorded a warrant gain of \$0.8 million, or 0.2% of revenue, compared to a gain of \$27.6 million, or 4.8% of revenue, for fiscal year 2018. The difference between periods were driven by a decrease in the estimated fair value of common stock warrants we issued in December 2010, which we carry as a liability at fair value.

Provision for income taxes. In fiscal year 2019, the provision for income taxes was a benefit of \$39.4 million, or 7.9% of revenue, compared to a benefit of \$21.5 million, or 3.8% of revenue, for fiscal year 2018. The provision decreased primarily due to the immediate recognition of the current and deferred income tax effects totaling \$39.8 million from an intra-entity transfer of a license for intellectual property to a higher taxed jurisdiction that received a tax basis step-up. For fiscal year 2018, the blended U.S. federal income tax rate was 24.5%. For fiscal year 2019, the U.S. federal income tax rate was 21%.

The difference between the U.S. federal income tax rate of 21% and our effective income tax rate of 9.3% for fiscal year 2019 was primarily impacted by the reduction of our NOLs from section 382 limitations, the immediate recognition of the current and deferred income tax effects of an intra-entity transfer of a license for intellectual property and the valuation allowance against our U.S. deferred tax assets. For fiscal year 2018, our effective income tax rate of 13.8% was primarily impacted by the Tax Act, partially offset by the valuation allowance against our U.S. deferred tax assets.

Comparison of Fiscal Year Ended September 28, 2018 to Fiscal Year Ended September 29, 2017

We acquired AppliedMicro on January 26, 2017 and certain assets of Picometrix on August 9, 2017, and we divested the Compute business on October 27, 2017 and our LR4 business on May 10, 2018. For additional information related to acquisitions and divestitures refer to *Note 4 - Acquisitions* and *Note 23 - Divested Business and Discontinued Operations*, respectively, in this Annual Report. Our annual Statements of Operations includes activity since the dates of acquisition for AppliedMicro and Picometrix and excludes activity for the Compute business and LR4 business after the date of the divestiture, representing less than twelve months of activity for AppliedMicro and Picometrix for the fiscal year ended September 29, 2017.

Revenue. In fiscal year 2018, our revenue decreased by \$128.4 million, or 18.4%, to \$570.4 million from \$698.8 million for fiscal year 2017.

Revenue from our primary markets, the percentage of change between the years and revenue by primary markets expressed as a percentage of total revenue were (in thousands, except percentages):

	Fiscal Years		% Change
	2018	2017	
Telecom	\$ 222,940	\$ 340,022	(34.4)%
Data Center	162,098	172,481	(6.0)%
Industrial & Defense	185,360	186,269	(0.5)%
Total	570,398	698,772	(18.4)%
Telecom	39.1%	48.6%	
Data Center	28.4%	24.7%	
Industrial & Defense	32.5%	26.7%	
Total	100.0%	100.0%	

In fiscal year 2018, our Telecom market revenue decreased by \$117.1 million, or 34.4%, compared to fiscal year 2017. The decrease was primarily due to lower sales of carrier-based optical semiconductor products to our Asia customer base, lower sales of products targeting fiber to the home applications and the May 2018 sale of our LR4 business.

In fiscal year 2018, our Data Center market revenue decreased by \$10.4 million, or 6.0%, compared to fiscal year 2017. The decrease was primarily due to decreased revenue from sales of legacy optical products and lasers and cloud data center applications.

In fiscal year 2018, our I&D market revenues decreased by \$0.9 million, or 0.5%, compared to fiscal year 2017. The decrease was primarily related to lower certain legacy defense products partially offset by higher revenue across other areas within the product portfolio.

Gross profit. In fiscal year 2018, our gross profit decreased by \$81.2 million, or 24.8%, compared to fiscal year 2017. Gross margin of 43.1% in fiscal year 2018 decreased 370 basis points, compared to fiscal year 2017. Gross profit during 2018 was negatively impacted by lower fiscal year 2018 revenue, ZTE-related inventory charges, production and product line exit costs of \$17.2 million, higher depreciation and amortization expense primarily associated with the AppliedMicro and Picometrix Acquisitions, partially offset by lower acquisition related inventory fair market value step up expense recorded during fiscal year 2017.

Research and development. In fiscal year 2018, research and development expense increased by \$29.7 million, or 20.1%, to \$177.7 million representing 31.2% of revenue, compared with \$148.0 million, or 21.2% of revenue in fiscal year 2017. Research and development expense increased in the 2018 period primarily as a result of higher AppliedMicro-related compensation costs, share-based compensation and depreciation expense, as well as increased spending for Data Center-related initiatives.

Selling, general and administrative. In fiscal year 2018, selling, general and administrative expenses decreased by \$26.2 million, or 14.0% to \$161.7 million, or 28.3% of revenue, compared with \$187.9 million, or 26.9% of revenue, for fiscal year 2017. Selling, general and administrative expenses decreased in the fiscal year 2018 period primarily due to no fiscal year 2018 AppliedMicro change in control payments, lower acquisition-related transaction expenses, lower integration costs and lower share-based compensation costs, partially offset by higher intangible amortization and acquisition-related compensation.

Impairment charges. We recorded impairment charges of \$6.6 million, or 1.2% of revenue, in fiscal year 2018, related to property and equipment and other assets designated for future use with ZTE as a result of the April 15, 2018 denial order issued by the U.S. Department of Commerce's Bureau of Industry and Security's List of Denied Persons. During fiscal year 2017, we recorded impairment

charges of \$4.4 million related to an in process research and development technology asset that was placed in service, at which time we determined that the intangible asset value was impaired due to lower than expected cash flow projections.

Restructuring charges. In fiscal year 2018, restructuring charges were \$6.3 million, or 1.1% of our revenue, compared with \$2.7 million, or 0.4% of our revenue, for fiscal year 2017. The increase in restructuring charges during fiscal year 2018 was primarily related to the completion of our exit of facilities in Long Beach, California, Belfast, the United Kingdom and Sydney, Australia.

Warrant liability gain. In fiscal year 2018, we recorded a warrant gain of \$27.6 million, or 4.8% of revenue, compared to an expense of \$2.5 million, or 0.4% of revenue, for fiscal year 2017. The difference between periods were driven by a decrease in the estimated fair value of common stock warrants we issued in December 2010, which we carry as a liability at fair value.

Provision for income taxes. In fiscal year 2018, the provision for income taxes was a benefit of \$21.5 million, or 3.8% of revenue, compared to an expense of \$100.9 million, or 14.4% of revenue, for fiscal year 2017. The provision decreased primarily due to changes in the valuation allowance against our U.S. deferred tax assets, partially offset by the impact of the 2017 Tax Cuts and Jobs Act (“Tax Act”) which was enacted during our fiscal year 2018. For the fiscal year ended September 28, 2018, the blended U.S. federal income tax rate was 24.5%.

The difference between the blended U.S. federal income tax rate of 24.5% and our effective income tax rate for fiscal year 2018 was primarily impacted by the Tax Act, partially offset by the valuation allowance against our U.S. deferred tax assets. For fiscal year 2017, our effective income tax rate was primarily impacted by an establishment of a full valuation allowance against our U.S. deferred tax assets as well as income taxed in foreign jurisdictions at tax rates generally lower than the U.S. rate.

During fiscal year 2018, the Company’s unrecognized tax benefits decreased by \$1.4 million to \$0.3 million due to the audit settlement of our fiscal year 2014 U.S. tax filings. The remaining unrecognized tax benefits of \$0.3 million primarily relates to transfer pricing positions taken on foreign tax filings in tax years 2010 - 2013.

LIQUIDITY AND CAPITAL RESOURCES

The following table summarizes our cash flow activities for the fiscal years ended September 27, 2019 and September 28, 2018, respectively (in thousands):

	Fiscal Year Ended	
	September 27, 2019	September 28, 2018
Cash and cash equivalents, beginning of period	\$ 94,676	\$ 130,104
Net cash provided by operating activities	20,700	36,293
Net cash used in investing activities	(33,891)	(67,119)
Net cash used in financing activities	(5,828)	(4,451)
Effect of exchange rates on cash balances	(138)	(151)
Cash and cash equivalents, end of period	<u>\$ 75,519</u>	<u>\$ 94,676</u>

Cash Flow from Operating Activities:

Our cash flow from operating activities for fiscal year 2019 was \$20.7 million and consisted of a net loss of \$383.8 million, plus adjustments to reconcile our net loss to cash provided by operating activities of \$371.5 million plus changes in operating assets and liabilities of \$33.0 million. Adjustments to reconcile our net loss to cash provided by operating activities of \$371.5 million primarily included impairment charges of \$273.6 million, depreciation and intangible amortization expense of \$104.4 million, share-based compensation expense of \$23.8 million, loss on minority equity investment of \$7.5 million and amortization of deferred financing costs of \$4.1 million, partially offset by an increase in deferred tax assets of \$41.3 million. In addition, cash from operating assets and liabilities was \$33.0 million for fiscal year 2019, primarily driven by a decrease in accounts receivable of \$27.6 million related to lower revenue from the prior fiscal year, and a decrease in inventory of \$15.0 million, partially offset by a decrease in accounts payable of \$12.2 million related to timing of vendor payments. The fiscal year 2019 decrease in accounts receivable balances was primarily due to lower revenue compared to fiscal year 2018.

Our cash flow from operating activities for fiscal year 2018 was \$36.3 million and consisted of a net loss of \$140.0 million, plus adjustments to reconcile our net loss to cash provided by operating activities of \$153.7 million plus changes in operating assets and liabilities of \$22.6 million. Adjustments to reconcile our net income to cash provided by operating activities of \$153.7 million primarily included depreciation and intangible amortization expense of \$112.4 million, loss on disposition of business of \$34.3 million, share-based compensation expense of \$31.9 million, loss on minority equity investment of \$10.4 million and impairment related charges of \$9.1 million, partially offset by a warrant liability gain of \$27.6 million. In addition, cash from operating assets and liabilities was \$22.6 million for fiscal year 2018, primarily driven by a decrease in accounts receivable of \$38.7 million, partially offset by an increase in prepaid expenses and other assets of \$10.6 million, a decrease in income taxes payable of \$3.1 million, a decrease in accounts payable of \$2.6 million and an increase in inventory of \$2.2 million. Inventory increases during fiscal year 2018 were expected to support anticipated customer demand and were net of production and product line exit write-offs and divested businesses. The fiscal year 2018 decrease in accounts receivable balances was primarily due to lower revenue compared to fiscal year 2017.

Cash Flow from Investing Activities:

Our cash flow used by investing activities for fiscal year 2019 consisted primarily of \$174.1 million in purchases of short-term investments and capital expenditures of \$38.0 million, partially offset by received proceeds of \$173.0 million related to the sale of short-term investments and \$5.5 million related to the sale of assets.

Our cash flow used by investing activities for fiscal year 2018 consisted primarily of \$114.5 million in purchases of short-term investments, capital expenditures of \$53.0 million and a \$5.0 million equity investment, partially offset by received proceeds of \$100.4 million related to the sale of short-term investments and \$5.0 million from the sale of the LR4 business.

Cash Flow from Financing Activities:

During fiscal year 2019, our cash used in financing activities of \$5.8 million was primarily related to \$6.9 million of principal payments associated with our Term Loans (as defined in *Note 10 - Debt* to our Consolidated Financial Statements included in this Annual Report) and \$4.1 million in purchases of stock associated with employee tax withholdings, partially offset by \$7.2 million of proceeds from stock option exercises and employee stock purchases.

During fiscal year 2018, our cash used in financing activities of \$4.5 million was primarily related to \$6.9 million of principal payments associated with our Term Loans and \$6.8 million in purchases of stock associated with employee tax withholdings, partially offset by \$7.0 million of proceeds from stock option exercises and employee stock purchases and \$4.0 million of proceeds from the sale of our corporate headquarters facility.

Liquidity

As of September 27, 2019, we held \$75.5 million of cash and cash equivalents, primarily deposited with financial institutions as well as \$101.2 million of liquid short-term investments. The undistributed earnings of our foreign subsidiaries, other than our M/A-COM Technology Solutions International Limited Cayman Islands subsidiary ("Cayman Islands subsidiary"), are considered indefinitely reinvested for the periods presented and we do not intend to repatriate such earnings. During fiscal year 2019 we changed our position for our Cayman Islands subsidiary to no longer have its earnings permanently reinvested. We believe the decision to reinvest these earnings will not have a significant impact on our liquidity. As of September 27, 2019, cash held by our indefinitely reinvested foreign subsidiaries was \$26.7 million, which, along with cash generated from foreign operations, is expected to be used in the support of international growth and working capital requirements as well as the repayment of certain intercompany loans. As of September 27, 2019 we had \$160.0 million in borrowing capacity under our Revolving Facility (as defined in *Note 10 - Debt* to our Consolidated Financial Statements included in this Annual Report).

We plan to use our remaining available cash and cash equivalents, short-term investments, and as deemed appropriate our borrowing capacity under our Revolving Facility for general corporate purposes, including working capital, or for the acquisition of or investment in complementary technologies, design teams, products and businesses. We believe that our cash and cash equivalents, short-term investments, cash generated from operations and borrowing availability under our Revolving Facility will be sufficient to meet our working capital requirements for at least the next twelve months. We may need to raise additional capital from time to time through the issuance and sale of equity or debt securities, and there is no assurance that we will be able to do so on favorable terms or at all.

OFF-BALANCE SHEET ARRANGEMENTS

As of September 27, 2019, we had no material transactions that meet the definition of an off-balance sheet arrangement required to be disclosed pursuant to SEC Regulation S-K Item 303(a)(4)(ii).

CONTRACTUAL OBLIGATIONS

The following is a summary of our contractual payment obligations for consolidated debt, purchase agreements, operating leases, other commitments and long-term liabilities as of September 27, 2019 (in thousands):

Contractual Cash Obligations	Payments Due By Period				
	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
Principal Payments on Long-term Debt (1)	\$ 672,971	\$ 6,885	\$ 13,770	\$ 652,316	\$ —
Interest Payments on Long-term Debt (1)	133,752	29,263	57,467	47,022	—
Capital Leases (3)	28,881	1,084	2,110	1,840	23,847
Estimated Interest Payments on Capital Leases (3)	26,241	2,216	4,117	3,828	16,080
Operating Lease Obligations (2)	54,729	9,987	16,680	11,624	16,438
Purchase Commitments (4)	68,631	63,898	4,689	44	—
Total Contractual Cash Obligations	\$ 985,205	\$ 113,333	\$ 98,833	\$ 716,674	\$ 56,365

- (1) Our Term Loans will mature in May 2024. See *Note 10 - Debt* to the Consolidated Financial Statements included in this Annual Report for additional information.
- (2) We have non-cancelable operating lease agreements for office, research, development and manufacturing space in the U.S. and certain foreign locations. We also have operating leases for certain equipment and services. These lease agreements expire at various dates through 2029 and certain agreements contain provisions for extension at substantially the same terms as currently in effect.
- (3) See *Note 11 - Capital Lease and Financing Obligations* to the Consolidated Financial Statements included in this Annual Report for additional information.
- (4) We have purchase commitments primarily for capital equipment, services and inventory supply arrangements. Approximately \$40.6 million is non-cancelable.

As of September 27, 2019, we estimated \$1.8 million in asset retirement obligations primarily for the restoration of leased facilities upon the termination of the related leases. Although it is reasonably possible that our estimates could materially change in the next twelve months, we are presently unable to reliably estimate when any cash settlement of these obligations may occur.

As of September 27, 2019, we recorded \$0.3 million of unrecognized tax benefits. We are unable to make a reasonable estimate as to when and if such amounts will be paid.

OTHER MATTERS

Inflation did not have a material impact upon our results of operations during the three-year period ended September 27, 2019.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risk in the ordinary course of business, which consists primarily of interest rate risk associated with our cash and cash equivalents, short-term investments and our variable rate debt, as well as foreign exchange rate risk. In addition, the value of our warrant liability is based on the underlying price of our common stock and changes in its value could significantly impact our warrant liability expense.

Interest rate risk. The primary objectives of our investment activity are to preserve principal, provide liquidity and invest excess cash for an average rate of return. To minimize market risk, we maintain our portfolio in cash and diversified investments, which may consist of corporate bonds, bank deposits, money market funds and commercial paper. The interest rates are variable and fluctuate with current market conditions. The risk associated with fluctuating interest rates is limited to this investment portfolio. We believe that a 10% change in interest rates would not have a material impact on our financial position or results of operations. We do not enter into financial instruments for trading or speculative purposes.

Our exposure to interest rate risk also relates to the increase or decrease in the amount of interest expense we must pay on the outstanding debt under the Credit Agreement. The interest rates on our term loans and revolving credit facility are variable interest rates based on our lender's prime rate or a LIBOR rate, in each case plus an applicable margin, which exposes us to market interest rate risk when we have outstanding borrowings under the Credit Agreement. As of September 27, 2019, we had \$673.0 million of outstanding borrowings under the Credit Agreement. Assuming our outstanding debt remains constant under the Credit Agreement for an entire year and the applicable annual interest rate increases or decreases by 1%, our annual interest expense would increase or decrease by \$6.7 million.

Foreign currency risk. To date, our international customer agreements have been denominated primarily in U.S. dollars. Accordingly, we have limited exposure to foreign currency exchange rates. The functional currency of a majority of our foreign operations continues to be in U.S. dollars with the remaining operations being local currency. Increases in the value of the U.S. dollar relative to other currencies could make our products more expensive, which could negatively impact demand in certain regions. Conversely, decreases in the value of the U.S. dollar relative to other currencies could result in our products being more expensive to certain customers and could reduce

or delay orders, or otherwise negatively affect how they do business with us. The effects of exchange rate fluctuations on the net assets of the majority of our operations are accounted for as transaction gains or losses. We believe that a change of 10% in such foreign currency exchange rates would not have a material impact on our financial position or results of operations. In the future, we may enter into foreign currency exchange hedging contracts to reduce our exposure to changes in exchange rates.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of MACOM Technology Solutions Holdings, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of MACOM Technology Solutions Holdings, Inc. and subsidiaries (the "Company") as of September 27, 2019 and September 28, 2018, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows, for each of the three years in the period ended September 27, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of September 27, 2019 and September 28, 2018, and the results of its operations and its cash flows for each of the three years in the period ended September 27, 2019, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of September 27, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated November 25, 2019, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Impairment - Long-Lived Assets - Refer to Notes 2 and 17 to the financial statements

Critical Audit Matter Description

The Company evaluates long-lived assets, which includes property, plant, and equipment and definite-lived intangible assets, for recoverability when events or changes in circumstances indicate that their carrying amounts may not be recoverable. In fiscal year 2019, the Company recorded impairment charges of \$264.8 million, including \$219.9 million related to customer relationships, \$37.1 million related to acquired technology and \$7.8 million related to property, plant and equipment, primarily as a result of restructuring actions initiated during the year.

The determination and valuation of long-lived asset groups, specifically the customer relationship and acquired technology intangible assets, require significant management judgments when assessing for potential impairment. These analyses are based on the creation of forecasts of future operating results that are used in the valuation for each identified asset group which requires management to make significant estimates and assumptions related to (1) forecasted revenue used in the future cash flows and (2) the determination of the discount rate. Changes in these assumptions and judgments could have a significant impact on either the fair value, the amount of any impairment charge, or both for the identified asset groups.

We identified the valuation of the long-lived asset groups as a critical audit matter because of the significant estimates and assumptions management makes to determine the asset groups and to estimate the valuation of the customer relationships and acquired technology. This required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists with quantitative and modeling expertise when performing audit procedures to evaluate the reasonableness of management's determination of the asset groups and forecasts of future operating results, including estimation of (1) forecasted revenue, particularly related to those new product lines that do not have historical experience, and (2) the determination of the discount rate.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the valuation of the long-lived asset group, including management's determination of the asset groups and forecasts of future operating results included the following, among others:

- We tested the effectiveness of controls over the valuation of long-lived assets, including those controls over the identification of asset groups and the review of (1) the forecasted revenue, particularly related to those new product lines that do not have historical experience, and (2) the determination of the discount rate.
- We evaluated the appropriateness of management's conclusions regarding the identification of asset groups by holding discussions with senior financial and operating management to gain an understanding of the strategic plans for the business, assess the impact of recent changes within the business, and review available discrete financial information.
- We evaluated the forecasted revenue, particularly related to those new product lines that do not have historical experience, by performing the following procedures:
 - We obtained an understanding of the key assumptions used in the revenue forecast and corroborated the reasonableness of those assumptions by comparing it to (1) historical revenues, (2) internal communications with management and the Board of Directors, and (3) forecasted information included in analyst and industry reports for the Company and certain of its peer companies.
 - Due to the lack of historical experience available for certain new product lines, we evaluated the reasonableness of management's revenue forecasts of the new product lines by comparing the forecasts to (1) internal communications to management and the board of directors, (2) customer produced forecasted demand, and (3) industry reports containing analyses of the Company's and its competitor's products.
- With the assistance of our fair value specialists, we evaluated the reasonableness of the discount rate by:
 - Testing the source information underlying the determination of the discount rate and testing the mathematical accuracy of the calculation.
 - Developing a range of independent estimates and comparing those to the discount rate selected by management.

Inventories - Excess Quantities and Obsolescence Reserve - Refer to Notes 2 and 8 to the financial statements

Critical Audit Matter Description

The Company evaluates inventory each reporting period for excess quantities and obsolescence, establishing reserves when necessary based upon historical experience, assessment of economic conditions, and expected demand. Once recorded, these reserves are considered permanent adjustments to the carrying value of inventory. As of September 27, 2019, the Company has inventories of \$107.9 million, net of excess quantities and obsolescence reserves.

We identified the reserve for excess quantities and obsolete inventory as a critical audit matter because of the significant estimates and assumptions management makes to quantify and to record the reserve, including the determination of expected demand especially when considering the cyclical nature of the semiconductor industry. This required a high degree of auditor judgment and an increased extent of effort when performing audit procedures to evaluate the methodology and the reasonableness of assumptions including expected demand.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the reserve for excess quantities and obsolete inventory including management's estimate of expected demand, included the following, among others:

- We tested the effectiveness of controls over inventory, including those over the estimation of reserves for excess quantities and obsolescence and the review of any adjustments to the reserve methodology.

- We selected a sample of inventory parts and performed corroborative inquiry with product line managers associated with the selected part to corroborate our understanding of the expected demand of the part including future sales plans, product life cycle, and utilization in other products.
- We held discussions with senior financial and operating management to determine whether any strategic or operational changes in the business were consistent with the reserves as it relates to expected demand.
- We performed a retrospective review on the prior year inventory reserve, including the prior year expected demand, and compared it to current year activity.
- We compared the Company's inventory reserve assumptions to events and trends discussed in industry and analyst reports, recent press releases from the Company's major customers (including financial information), and other industry data. In addition, we also considered any changes within the business including restructuring events and strategic changes.

Income Taxes - Intra-entity transfer of a license for intellectual property - Refer to Note 19 to the financial statements

Critical Audit Matter Description

During the year ended September 27, 2019, the Company completed an intra-entity transfer of a license for intellectual property to a higher tax jurisdiction. The Company determined there was an incremental tax basis due to the intra-entity transfer and recognized a deferred tax asset and related income tax benefit of \$39.8 million based upon the tax basis step-up to the intellectual property's current fair value.

We identified management's determination of the tax basis resulting from the intra-entity transfer of a license for intellectual property to be a critical audit matter because of the significant judgments and estimates management made related to the interpretation and application of tax laws in the applicable jurisdiction. This required a high degree of auditor judgment and an increased extent of effort, including the need to involve our income tax and fair value specialists, when performing audit procedures to evaluate the reasonableness of management's determination of the tax basis.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the determination of the tax basis resulting from intra-entity transfer of a license for intellectual property, include the following, among others:

- We tested the effectiveness of controls over the intra-entity transfer of a license for intellectual property, including management's review of the underlying agreements, estimation of fair value, and the tax laws applicable to the transfer of a license for intellectual property.
- With the assistance of our income tax and fair value specialists, we evaluated the tax basis of the intra-entity transfer based upon applicable tax laws and evaluated the reasonableness of management's conclusions.

/s/ Deloitte & Touche LLP

Boston, Massachusetts
November 25, 2019

We have served as the Company's auditor since 2010.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands)

	September 27, 2019	September 28, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 75,519	\$ 94,676
Short-term investments	101,226	98,221
Accounts receivable (less allowances of \$5,047 and \$6,795, respectively)	69,790	97,375
Inventories	107,880	122,837
Income tax receivable	16,661	17,601
Assets held for sale	—	4,840
Prepaid and other current assets	27,506	23,311
Total current assets	398,582	458,861
Property, plant and equipment, net	132,647	149,923
Goodwill	314,727	314,076
Intangible assets, net	181,228	512,785
Deferred income taxes	43,812	2,272
Other investments	23,613	31,094
Other long-term assets	10,965	13,484
Total assets	\$ 1,105,574	\$ 1,482,495
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of leases payable	\$ 1,084	\$ 467
Current portion long-term debt	6,885	6,885
Accounts payable	24,822	41,951
Accrued liabilities	39,908	49,945
Deferred revenue	2,137	7,757
Total current liabilities	74,836	107,005
Leases payable, less current portion	29,506	29,023
Long-term debt, less current portion	655,272	658,372
Warrant liability	12,364	13,129
Other long-term liabilities	19,068	5,902
Deferred income taxes	632	389
Total liabilities	791,678	813,820
Stockholders' equity:		
Preferred stock, \$0.001 par value, 10,000 shares authorized, no shares issued	—	—
Common stock, \$0.001 par value, 300,000 shares authorized; 66,177 and 65,202 shares issued and 66,154 and 65,179 shares outstanding as of September 27, 2019 and September 28, 2018, respectively, of which 0 and 6 shares, respectively, are subject to forfeiture	66	65
Treasury Stock, at cost, 23 shares as of both September 27, 2019 and September 28, 2018	(330)	(330)
Accumulated other comprehensive income	4,358	2,188
Additional paid-in capital	1,101,576	1,074,728
Accumulated deficit	(791,774)	(407,976)
Total stockholders' equity	313,896	668,675
Total liabilities and stockholders' equity	\$ 1,105,574	\$ 1,482,495

See notes to consolidated financial statements.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share data)

	Fiscal Years		
	2019	2018	2017
Revenue	\$ 499,708	\$ 570,398	\$ 698,772
Cost of revenue	279,000	324,692	371,888
Gross profit	220,708	245,706	326,884
Operating expenses:			
Research and development	163,469	177,713	147,986
Selling, general and administrative	153,286	161,673	187,886
Impairment charges	264,786	6,575	4,352
Restructuring charges	19,543	6,265	2,744
Total operating expenses	601,084	352,226	342,968
Loss from operations	(380,376)	(106,520)	(16,084)
Other (expense) income:			
Warrant liability gain (expense)	765	27,646	(2,522)
Interest expense, net	(35,803)	(31,338)	(28,855)
Other expense	(7,739)	(45,023)	(2,044)
Total other expense, net	(42,777)	(48,715)	(33,421)
Loss before income taxes	(423,153)	(155,235)	(49,505)
Income tax (benefit) expense	(39,355)	(21,473)	100,911
Loss from continuing operations	(383,798)	(133,762)	(150,416)
Loss from discontinued operations	—	(6,215)	(19,077)
Net loss	\$ (383,798)	\$ (139,977)	\$ (169,493)
Net loss per share:			
Basic loss per share:			
Loss from continuing operations	\$ (5.84)	\$ (2.07)	\$ (2.48)
Loss from discontinued operations	—	(0.10)	(0.31)
Loss per share - basic	\$ (5.84)	\$ (2.16)	\$ (2.79)
Diluted loss per share:			
Loss from continuing operations	\$ (5.84)	\$ (2.47)	\$ (2.48)
Loss from discontinued operations	—	(0.10)	(0.31)
Loss per share - diluted	\$ (5.84)	\$ (2.57)	\$ (2.79)
Shares used:			
Basic	65,686	64,741	60,704
Diluted	65,686	65,311	60,704

See notes to consolidated financial statements.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In thousands)

	Fiscal Years		
	2019	2018	2017
Net loss	\$ (383,798)	\$ (139,977)	\$ (169,493)
Unrealized gain (loss) on short-term investments, net of tax	477	(287)	(63)
Foreign currency translation gain (loss), net of tax	1,693	(502)	(5,999)
Other comprehensive income (loss), net of tax	2,170	(789)	(6,062)
Total comprehensive loss	<u>\$ (381,628)</u>	<u>\$ (140,766)</u>	<u>\$ (175,555)</u>

See notes to consolidated financial statements.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)

	Common Stock		Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Additional Paid-In Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount	Shares	Amount				
Balance - September 30, 2016	53,709	\$ 54	(23)	\$ (330)	\$ 9,039	\$ 551,509	\$ (97,488)	\$ 462,784
Stock option exercises	234	—	—	—	—	3,117	—	3,117
Vesting of restricted common stock and units	984	—	—	—	—	—	—	—
Issuance of common stock pursuant to employee stock purchase plan	145	—	—	—	—	5,164	—	5,164
Shares repurchased for tax withholdings on restricted stock awards	(382)	—	—	—	—	(18,534)	—	(18,534)
Share-based compensation	—	—	—	—	—	36,335	—	36,335
Shares issued in connection with the AppliedMicro acquisition including converted equity awards	9,589	10	—	—	—	465,072	—	465,082
Equity issuance costs	—	—	—	—	—	(1,019)	—	(1,019)
Other comprehensive loss, net of tax	—	—	—	—	(6,062)	—	—	(6,062)
Net loss	—	—	—	—	—	—	(169,493)	(169,493)
Balance at September 29, 2017	64,279	\$ 64	(23)	\$ (330)	\$ 2,977	\$1,041,644	\$ (266,981)	\$ 777,374
Cumulative effect of ASU 2016-09	—	—	—	—	—	1,018	(1,018)	—
Stock option exercises	27	—	—	—	—	76	—	76
Vesting of restricted common stock and units	906	1	—	—	—	—	—	1
Issuance of common stock pursuant to employee stock purchase plan	306	—	—	—	—	6,881	—	6,881
Shares repurchased for tax withholdings on restricted stock awards	(316)	—	—	—	—	(6,828)	—	(6,828)
Share-based compensation	—	—	—	—	—	31,937	—	31,937
Other comprehensive loss, net of tax	—	—	—	—	(789)	—	—	(789)
Net loss	—	—	—	—	—	—	(139,977)	(139,977)
Balance at September 28, 2018	65,202	\$ 65	(23)	\$ (330)	\$ 2,188	\$1,074,728	\$ (407,976)	\$ 668,675
Stock option exercises	119	—	—	—	—	1,608	—	1,608
Vesting of restricted common stock and units	673	1	—	—	—	—	—	1
Issuance of common stock pursuant to employee stock purchase plan	422	—	—	—	—	5,585	—	5,585
Shares repurchased for tax withholdings on restricted stock awards	(239)	—	—	—	—	(4,137)	—	(4,137)
Share-based compensation	—	—	—	—	—	23,792	—	23,792
Other comprehensive income, net of tax	—	—	—	—	2,170	—	—	2,170
Net loss	—	—	—	—	—	—	(383,798)	(383,798)
Balance at September 27, 2019	66,177	\$ 66	(23)	\$ (330)	\$ 4,358	\$1,101,576	\$ (791,774)	\$ 313,896

See notes to consolidated financial statements.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Fiscal Years		
	2019	2018	2017
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net loss	\$ (383,798)	\$ (139,977)	\$ (169,493)
Adjustments to reconcile net (loss) income to net cash from operating activities:			
Depreciation and intangible amortization	104,418	112,383	92,998
Share-based compensation	23,792	31,937	36,335
Warrant liability (gain) expense	(765)	(27,646)	2,522
Acquired inventory step-up amortization	—	224	44,022
Deferred financing costs amortization and write offs	4,061	4,587	3,373
Acquisition prepaid compensation amortization	—	—	506
Loss (gain) from disposition of business	—	34,343	(25,520)
Deferred income taxes	(41,297)	(16,528)	92,171
Impairment related charges	273,572	9,143	4,352
Loss on minority equity investment	7,481	10,406	—
Changes in assets held for sale from discontinued operations	—	(6,644)	218
Other adjustments, net	194	1,463	2,400
Change in operating assets and liabilities:			
Accounts receivable	27,585	38,679	(15,754)
Inventories	14,964	(2,166)	(4,094)
Prepaid expenses and other assets	3,419	(10,585)	1,126
Accounts payable	(12,220)	(2,609)	3,449
Accrued and other liabilities	(2,486)	2,347	(15,176)
Income taxes	1,780	(3,064)	7,615
Net cash from operating activities	<u>20,700</u>	<u>36,293</u>	<u>61,050</u>
CASH FLOWS FROM INVESTING ACTIVITIES:			
Acquisition of businesses, net	(375)	(1,000)	(270,008)
Purchases of property and equipment	(37,963)	(53,044)	(32,804)
Proceeds from sale of assets	5,541	1,274	215
Proceeds from sales and maturities of short-term investments	173,020	100,375	44,555
Purchases of short-term investments	(174,114)	(114,461)	(105,048)
Purchases of other investments	—	(5,000)	—
Proceeds associated with divested business and discontinued operations	—	4,737	25,520
Net cash used in investing activities	<u>(33,891)</u>	<u>(67,119)</u>	<u>(337,570)</u>
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from stock option exercises and employee stock purchases	7,193	6,957	8,281
Payments on notes payable	(6,885)	(6,885)	(4,747)
Payments of capital leases and assumed debt	(1,421)	(713)	(1,137)
Repurchase of common stock- tax withholdings on equity awards	(4,137)	(6,828)	(18,534)
Proceeds from corporate facility financing obligation	—	4,000	—
Payments of financing costs	—	(505)	(9,077)
Proceeds from notes payable	—	—	96,558
Other adjustments, net	(578)	(477)	2,309
Net cash (used in) from financing activities	<u>(5,828)</u>	<u>(4,451)</u>	<u>73,653</u>
Foreign currency effect on cash	(138)	(151)	(6)
NET CHANGE IN CASH AND CASH EQUIVALENTS	(19,157)	(35,428)	(202,873)
CASH AND CASH EQUIVALENTS — Beginning of year	\$ 94,676	\$ 130,104	\$ 332,977
CASH AND CASH EQUIVALENTS — End of year	\$ 75,519	\$ 94,676	\$ 130,104
Supplemental disclosure of non-cash activities (See Note 25 - Supplemental Cash Flow Information)			
Issuance of common stock in connection with the AppliedMicro Acquisition (See Note 3 - Acquisitions)	\$ —	\$ —	\$ 465,082

See notes to consolidated financial statements.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. DESCRIPTION OF BUSINESS

MACOM Technology Solutions Holdings, Inc. (the "Company") was incorporated in Delaware on March 25, 2009. We are a leading provider of high-performance analog semiconductor solutions that enable next-generation Internet applications, the cloud connected apps economy, and the modern, networked battlefield across the RF, microwave, millimeterwave and lightwave spectrum. We design, develop, manufacture and have manufactured differentiated, high-value products for customers who demand high performance, quality and reliability.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation, Basis of Presentation and Reclassification—We have one reportable segment, semiconductors and modules. The accompanying consolidated financial statements include our accounts and the accounts of our majority-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

We have a 52- or 53-week fiscal year ending on the Friday closest to the last day of September. The fiscal years 2019, 2018 and 2017 included 52 weeks. To offset the effect of holidays, for fiscal years in which there are 53 weeks, we typically include the extra week arising in our fiscal years in the first quarter.

Use of Estimates—The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the U.S. requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities during the reporting periods, the reported amounts of revenue and expenses during the reporting periods and the disclosure of contingent assets and liabilities at the date of the financial statements. On an ongoing basis, we base estimates and assumptions on historical experience, currently available information and various other factors that management believes to be reasonable under the circumstances. Actual results may differ from these estimates and assumptions.

Divested Businesses and Discontinued Operations—In the first quarter of fiscal year 2018, we divested AppliedMicro's compute business (the "Compute business"). The operating results of the Compute business are reflected in discontinued operations. In the third quarter of fiscal year 2018, we divested our Japan-based long-range optical subassembly business (the "LR4 business"). The operating results of the LR4 business have been reflected in our continuing operations up through the May 10, 2018 sale date, with the \$34.3 million loss on disposal recorded as other expense. See *Note 23 - Divested Business and Discontinued Operations* for additional information.

Foreign Currency Translation and Remeasurement—Our consolidated financial statements are presented in U.S. dollars. While the majority of our foreign operations use the U.S. dollar as the functional currency, the financial statements of our foreign operations for which the functional currency is not the U.S. dollar are translated into U.S. dollars at the exchange rates in effect at the balance sheet dates (for assets and liabilities) and at average exchange rates (for revenue and expenses). The unrealized translation gains and losses on the net investment in these foreign operations are accumulated as a component of other comprehensive (loss) income.

The financial statements of our foreign operations where the functional currency is the U.S. dollar, but where the underlying transactions are transacted in a different currency, are remeasured at the exchange rate in effect at the balance sheet date with respect to monetary assets and liabilities. Nonmonetary assets and liabilities, such as inventories and property and equipment and related statements of operations accounts, such as cost of revenue and depreciation, are remeasured at historical exchange rates. Revenue and expenses, other than cost of revenue, amortization and depreciation, are translated at the average exchange rate for the period in which the transaction occurred. The net gains and losses on foreign currency remeasurement are reflected in selling, general and administrative expense in the accompanying Consolidated Statements of Operations. Net foreign exchange transaction gains and losses for all periods presented were not material.

Cash and Cash Equivalents—Cash equivalents are primarily composed of short-term, highly-liquid instruments with an original maturity of 90 days or less and consist primarily of money market funds.

Investments—*Short-term investments*: We classify our short-term investments as available-for-sale. Our investments classified as available-for-sale are recorded at fair value based upon third party pricing at period end. Unrealized gains and losses that are deemed temporary in nature are recorded in accumulated other comprehensive income and loss as a separate component of stockholders' equity.

A decline in the fair value of any security below cost that is deemed other than temporary results in a charge to earnings and the corresponding establishment of a new cost basis for the security. Premiums and discounts are amortized (accrued) over the life of the related security as an adjustment to its yield. Dividend and interest income are recognized when earned. Realized gains and losses are included in earnings and are derived using the specific identification method for determining the cost of investments sold.

Other investments: We use the equity method to account for investments in companies if the investment provides us with the ability to exercise significant influence over operating and financial policies of the investee. Our proportionate share of the net income (loss) resulting from these investments are reported within the Other expense line in our Consolidated Statements of Operations.

The carrying value of our equity method investment is reported in Other investments in our Consolidated Balance Sheets. Our equity method investment is reported at cost and adjusted each period for our share of the investee's income or loss and dividends paid, if any, as well as any changes attributable to the equity of the investee that would impact our ownership.

Other investments that are not controlled, and over which we do not have the ability to exercise significant influence, are accounted for under the cost method and reported in Other investments in our Consolidated Balance Sheets.

We have elected that our cost method investments, which do not have readily determinable fair values and do not qualify for the practical expedient under Accounting Standards Codification ("ASC") 820, *Fair Value Measurement*, are carried at cost less any impairment. The investments do not have readily determinable fair values and are periodically evaluated for impairment. An impairment loss would be recorded whenever there is a decline in value of an investment below its carrying amount that is determined to be other than temporary.

Refer to *Note 5 - Investments*, for additional information.

Inventories—Inventories are stated at the lower of cost or net realizable value. We use a combination of standard cost and moving weighted-average cost methodologies to determine the cost basis for our inventories, approximating a first-in, first-out basis. The standard cost of finished goods and work-in-process inventory is composed of material, labor and manufacturing overhead, which approximates actual cost. In addition to stating inventory at the lower of cost or net realizable value, we also evaluate inventory each reporting period for excess quantities and obsolescence, establishing reserves when necessary based upon historical experience, assessment of economic conditions and expected demand. Once recorded, these reserves are considered permanent adjustments to the carrying value of inventory.

Property, Plant and Equipment—Property, plant and equipment is stated at cost, less accumulated depreciation and amortization. Expenditures for maintenance and repairs are charged to expense as incurred, whereas major improvements that significantly extend the useful life of the assets are capitalized as additions to property and equipment.

Property and equipment are depreciated or amortized using the straight-line method over the following estimated useful lives:

Asset Classification	Estimated Useful Life (In Years)
Buildings and improvements	20 – 40
Capital lease assets	5 - 20
Computer equipment and software	2 – 5
Furniture and fixtures	7 – 10
Leasehold improvements	Shorter of useful life or term of lease
Machinery and equipment	2 – 7

Goodwill and Indefinite-Lived Intangible Assets—We have goodwill and certain intangible assets with indefinite lives which are not subject to amortization; these are reviewed for impairment annually as of the end of our August fiscal month end and more frequently if events or changes in circumstances indicate that the assets may be impaired. For our assessment of goodwill impairment, we compare the carrying value of the reporting unit to the fair value of the Company. For our assessment of in-service indefinite-lived assets we compare the carrying value of the asset to the estimated fair value of the asset. For indefinite-lived assets not in service, such as in-process research and development, we perform both qualitative and quantitative assessments using an assumption of "more likely than not" to determine if there are any impairment indicators. If impairment exists, a loss is recorded to write down the value of the assets to their implied fair values. During the fiscal year ended September 29, 2017, we recorded impairment charges related to indefinite-lived intangible assets. See *Note 17 - Impairments*, for further detail of these impairment charges. There were no significant expenses related to abandoned in-process research and development projects in any other period presented.

Long-Lived Asset Valuation and Impairment Assessment—Long-lived assets include property and equipment and definite-lived intangible assets subject to amortization. We evaluate long-lived assets for recoverability when events or changes in circumstances indicate that their carrying amounts may not be recoverable. Circumstances which could trigger a review include, but are not limited to, significant decreases in the market price of the asset or asset group, significant adverse changes in the business climate or legal factors, the accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the asset, current period cash flow or operating losses combined with a history of losses or a forecast of continuing losses associated with the use of the asset and a current expectation that the asset will more likely than not, be sold or disposed of significantly before the end of its previously estimated useful life.

In evaluating a long-lived asset for recoverability, we estimate the undiscounted cash flows expected to result from our use and eventual disposition of the asset. If the sum of the expected undiscounted cash flows is less than the carrying amount of the asset group,

an impairment loss, equal to the excess of the carrying amount over the fair value of the asset, is recognized. In fiscal year 2019, we recorded impairment charges primarily as a result of restructuring actions initiated during the year. In fiscal year 2018, we recorded impairment charges related to property and equipment and other assets designated for future use with Zhongxing Telecommunications Equipment Corporation ("ZTE"), as a result of the Bureau of Industry and Security ("BIS") denial order on April 15, 2018. There were no impairments of long-lived assets in fiscal year 2017. See *Note 17 - Impairments*, for further detail of these impairment charges. Intangible assets related to in-process research and development acquired are not amortized until the underlying asset begins revenue-generating activity, at which time it is amortized over its estimated useful life. Intangibles related to abandoned in-process research and development projects are expensed in the period the project is abandoned.

Other Intangible Assets—Our other intangible assets, including acquired technology and customer relationships, are definite-lived assets and are subject to amortization. We amortize definite-lived assets over their estimated useful lives, which range from five to fourteen years, generally based on the pattern over which we expect to receive the economic benefit from these assets.

Revenue Recognition—Substantially all of our revenue is derived from sales of high-performance RF, microwave, millimeterwave and lightwave semiconductor solutions into three primary markets: Telecom, Data Centers and I&D.

In fiscal years 2018 and 2017, we recognized revenue under Accounting Standards Codification ("ASC") 605, *Revenue Recognition*, when: (i) persuasive evidence of an arrangement existed; (ii) delivery or services had been rendered; (iii) the price was fixed or determinable; and (iv) collectability was reasonably assured. We recognized revenue with the transfer of title and risk of loss and provided for reserves for returns and other allowances.

In fiscal year 2019, we recognized revenue within the scope of ASC 606, *Revenue from Contracts with Customers*. Revenue is recognized when a customer obtains control of products or services in an amount that reflects the consideration which we expect to receive in exchange for those goods or services. To determine revenue recognition for arrangements within the scope of ASC 606, we perform the following five steps: (1) identify the contract(s) with a customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when (or as) we satisfy performance obligations. Sales, value add and other taxes collected on behalf of third parties are excluded from revenue. Our revenue arrangements do not contain significant financing components.

Contracts with our customers principally contain only one distinct performance obligation, which is the sale of products. However, due to multiple products potentially being sold on a single order, we are required to allocate consideration based on the estimated relative standalone selling prices of the promised products.

Periodically, we enter into non-product development and license contracts with certain customers. We generally recognize revenue from these contracts over-time as services are provided based on the terms of the contract. Revenue is deferred for amounts billed or received prior to delivery of the services. Certain contracts may contain multiple performance obligations for which we allocate revenue to each performance obligation based on the relative standalone selling price.

Our product revenue is recognized when the customer obtains control of the product or services, which generally occurs at a point in time, and is based on the contractual shipping terms of a contract. Non-product revenue is generally recognized over time. For each contract, the promise to transfer the control of the products or services, each of which is individually distinct, is considered to be the identified performance obligation. We provide an assurance type warranty which is not sold separately and does not represent a separate performance obligation. Therefore, we account for such warranties under ASC 460, *Guarantees*, and the estimated costs of warranty claims are generally accrued as cost of revenue in the period the related revenue is recorded.

We have agreements with certain distribution customers which may include certain rights of return and pricing programs, including returns for aged inventory, stock rotation and price protection which affect the transaction price. Sales to these customers and programs offered are in accordance with terms set forth in written agreements, which require us to assess the potential revenue effects of this variable consideration utilizing the expected value method. Variable consideration is included in the transaction price if, in our judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. As such, revenue on sales to customers that include rights of return and pricing programs are recorded net of estimated variable consideration, utilizing the expected value method based on historical sales data. We believe that the judgments and estimates we utilize are reasonable based upon current facts and circumstances, however utilizing different judgments and estimates could result in different amounts.

Practical Expedients and Elections—ASC 606 requires that we disclose the aggregate amount of transaction price that is allocated to performance obligations that have not yet been satisfied as of the reporting periods presented. The guidance provides certain practical expedients that limit this requirement and, therefore, we do not disclose the value of unsatisfied performance obligations for (i) contracts with an original expected length of one year or less and (ii) contracts for which revenue is recognized at the amount to which we have the right to invoice for services performed. We have elected not to disclose the aggregate amount of transaction prices associated with unsatisfied or partially unsatisfied performance obligations for contracts where these criteria are met.

Our policy is to capitalize any incremental costs incurred to obtain a customer contract, only to the extent that the benefit associated with the costs is expected to be longer than one year. Capitalizable contract costs were not significant both at the date of adoption and as of September 27, 2019.

We account for shipping and handling activities related to contracts with customers as costs to fulfill the promise to transfer the

associated products. When shipping and handling costs are incurred after a customer obtains control of the products, we have elected to account for these as costs to fulfill the promise and not as a separate performance obligation. Shipping and handling costs associated with the distribution of products to customers are recorded in costs of revenue generally when the related product is shipped to the customer.

Research and Development Costs—Costs incurred in the research and development of products are expensed as incurred.

Income Taxes—Deferred tax assets and liabilities are recognized based on temporary differences between the financial reporting and income tax bases of assets and liabilities, using rates anticipated to be in effect when such temporary differences reverse. A valuation allowance against net deferred tax assets is required if, based upon the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

We provide reserves for potential payments of tax to various tax authorities related to uncertain tax positions and other issues. Reserves are based on a determination of whether and how much of a tax benefit is taken by us in our tax filings or positions that are more likely than not to be realized following an examination by taxing authorities. We recognize the financial statement benefit of an uncertain tax position only after considering the probability that a tax authority would sustain the position in an examination. For tax positions meeting a “more-likely-than-not” threshold, the amount recognized in the financial statements is the benefit expected to be realized upon settlement with the tax authority. For tax positions not meeting the threshold, no financial statement benefit is recognized. Potential interest and penalties associated with such uncertain tax positions are recorded as a component of income tax expense.

Earnings Per Share—Basic net (loss) income per share is computed by dividing net (loss) income by the weighted-average number of common shares outstanding during the period, excluding the dilutive effect of common stock equivalents. Diluted net (loss) income per share reflects the dilutive effect of common stock equivalents, such as stock options, warrants and restricted stock units, using the treasury stock method.

Fair Value Measurements—Financial assets and liabilities are measured at fair value. Fair value is an exit price, representing the amount that would be received from the sale of an asset or paid to transfer a liability at the measurement date under current market conditions in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, we group financial assets and liabilities in a three-tier fair value hierarchy, according to the inputs used in measuring fair value as follows: Level 1—observable inputs such as quoted prices in active markets for identical assets and liabilities; Level 2—inputs other than quoted prices in active markets that are observable either directly or indirectly, such as quoted prices in active markets for similar assets and liabilities, quoted prices for identical assets and liabilities in markets that are not active and model-based valuation techniques for which significant assumptions are observable in active markets; and, Level 3—unobservable inputs for which there is little or no market data, requiring us to develop our own assumptions for model-based valuation techniques. This hierarchy requires us to use observable market data, when available, and to minimize the use of unobservable inputs when determining fair value.

Money market funds are actively traded and consist of highly liquid investments with original maturities of 90 days or less. They are measured at their net asset value and classified as Level 1. Corporate and agency bonds and commercial paper are categorized as Level 2 assets except where sufficient quoted prices exist in active markets, in which case such securities are categorized as Level 1 assets. These securities are valued using third-party pricing services. These services may use, for example, model-based pricing methods that utilize observable market data as inputs. We generally use quoted prices for recent trading activity of assets with similar characteristics to the debt security or bond being valued. The securities and bonds priced using such methods are generally classified as Level 2. Broker dealer bids or quotes on securities with similar characteristics may also be used.

The carrying amounts of cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximate fair value due to the short-term nature of these assets and liabilities.

Share-Based Compensation—We account for all share-based compensation arrangements using the fair value method. We recognize compensation expense over the requisite service period of the award, which is generally the vesting period, using the straight-line method for service-based awards and the accelerated method for performance-based awards, and providing that the minimum amount of compensation recorded is equal to the vested portion of the award. We record the expense in the Consolidated Statements of Operations in the same manner in which the award recipients’ salary costs are classified. For restricted stock awards with service conditions we use the closing stock price on the date of grant to estimate the fair value of the awards. We use the Black-Scholes option-pricing model to estimate the fair value of stock options with service and performance conditions, inclusive of assumptions for risk-free interest rates, dividends, expected terms and estimated volatility. We use the Monte Carlo Simulation analysis to estimate the fair value of stock options and awards with market conditions, inclusive of assumptions for risk free interest rates, expected term, expected volatility and the target price. We derive the risk-free interest rate assumption from the U.S. Treasury’s rates for U.S. Treasury zero-coupon bonds with maturities similar to the expected term of the award being valued. We base the assumed dividend yield on its expectation of not paying dividends in the foreseeable future. We calculate the weighted-average expected term of the options using historical data. In addition, we calculate our estimated volatility using our historical stock price volatility data. In fiscal year 2018 we adopted Accounting Standards Update (“ASU”) 2016-09, *Compensation - Stock Compensation* (“ASU 2016-09”), and upon adoption we elected to account for forfeitures when they occur. Prior to the adoption of ASU 2016-09 the accounting for share-based compensation required forfeitures to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differed from those estimates. Share-based awards that are settled in cash are recorded as liabilities. The measurement of the liability and compensation cost for these awards is based on

the fair value of the award, and is recorded in operating income over the award's vesting period. Changes in our payment obligation prior to the settlement date of a stock-based award are recorded as compensation expense in operating income in the period of the change. The final payment amount for such awards is established on the date of the exercise of the award by the employee.

Guarantees and Indemnification Obligations—We enter into agreements in the ordinary course of business with, among others, customers, distributors and OEMs. Most of these agreements require us to indemnify the other party against third-party claims alleging that a Company product infringes a patent and/or copyright. Certain agreements in which we grant limited licenses to Company intellectual property require us to indemnify the other party against third-party claims alleging that the use of the licensed intellectual property infringes a third-party's intellectual property. Certain of these agreements require us to indemnify the other party against certain claims relating to property damage, personal injury or the acts or omissions, its employees, agents or representatives. In addition, from time to time, we have made certain guarantees in the form of warranties regarding the performance of Company products to customers.

We have agreements with certain vendors, creditors, lessors and service providers pursuant to which we have agreed to indemnify the other party for specified matters, such as acts and omissions, its employees, agents or representatives.

We have procurement or license agreements with respect to technology used in our products and agreements in which we obtain rights to a product from an OEM. Under some of these agreements, we have agreed to indemnify the supplier for certain claims that may be brought against such party with respect to our acts or omissions relating to the supplied products or technologies.

Our certificate of incorporation and agreements with certain of our directors and officers and certain of our subsidiaries' directors and officers provide them indemnification rights, to the extent legally permissible, against liabilities incurred by them in connection with legal actions in which they may become involved by reason of their service as a director or officer. As a matter of practice, we have maintained director and officer liability insurance coverage, including coverage for directors and officers of acquired companies.

We have not experienced any losses related to these indemnification obligations in any period presented and no claims with respect thereto were outstanding as of September 27, 2019 and September 28, 2018. We do not expect significant claims related to these indemnification obligations and, consequently, have concluded that the fair value of these obligations is negligible. No liabilities related to indemnification liabilities have been established.

Recent Accounting Pronouncements

Pronouncements Adopted in Fiscal Year 2019

We adopted ASU 2014-09, *Revenue from Contracts with Customers*, on September 29, 2018. The Financial Accounting Standards Board ("FASB") subsequently issued several amendments and updates to the new revenue standard. We refer to ASU 2014-09 and its related ASUs as "ASC 606". We applied ASC 606 using the modified retrospective method and elected to apply this initial application of the standard only to contracts that are not completed at the date of initial application. We have analyzed this effect and found the adoption of the new guidance did not have a material impact on our consolidated financial statements as of the adoption date. The reported results for our fiscal year 2019 reflect the application of ASC 606 guidance while the reported results for our fiscal year 2018 were prepared under the guidance of ASC 605, *Revenue Recognition*.

We adopted ASU 2016-01, *Recognition and Measurement of Financial Assets and Financial Liabilities*, on September 29, 2018. In February 2018, the FASB issued further amendments to this guidance. This ASU amended the guidance on the classification and measurement of financial instruments. The new standard significantly revised an entity's accounting related to (1) the classification and measurement of investments in equity securities and (2) the presentation of certain fair value changes for financial liabilities measured at fair value. It also amended certain disclosure requirements associated with the fair value of financial instruments. The adoption of this update did not have a material impact on our consolidated financial statements and related disclosures.

We adopted ASU 2016-15, *Classification of Certain Cash Receipts and Cash Payments*, on September 29, 2018. This update addressed debt prepayment or debt extinguishment costs, settlement of zero-coupon debt instruments or other debt instruments with coupon interest rates that are insignificant in relation to the effective interest rate of the borrowing, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance policies, distributions received from equity method investees, beneficial interests in securitization transactions and separately identifiable cash flows and application of the predominance principle. The adoption of this update did not have a material impact on our consolidated financial statements and related disclosures.

We adopted ASU 2016-16, *Intra-Entity Transfers of Assets Other Than Inventory*, on September 29, 2018. This update provides guidance that changes the accounting for income tax effects of intra-entity transfers of assets other than inventory. Under the new guidance, the selling (transferring) entity is required to recognize a current tax expense or benefit upon transfer of the asset. Similarly, the purchasing (receiving) entity is required to recognize a deferred tax asset or deferred tax liability, as well as the related deferred tax benefit or expense, upon receipt of the asset. The adoption of this standard did not have a material impact on our consolidated financial statements and related disclosures.

Pronouncements for Adoption in Subsequent Periods

In February 2016, the FASB issued ASU 2016-02, *Leases* ("ASC 842"). The FASB subsequently issued several amendments and updates to the new leasing standard. The new standard increases transparency and comparability among organizations by recognizing right-of-use assets and lease liabilities on the Balance Sheet and disclosing key information about leasing arrangements. Under ASC 842, leases are classified as either operating or finance, based on criteria similar to current lease accounting, but without explicit bright lines. ASC 842 is effective for us as of September 28, 2019, and we will apply ASC 842 using the cumulative-effect adjustment on this date, with comparative periods presented in accordance with the previous guidance in ASC 840, *Leases* ("ASC 840"). We will use certain targeted transitional approaches that are intended to provide relief in implementing the new standard which allows us to not reassess previous accounting conclusions around whether arrangements are, or contain, leases; the classification of leases; and the treatment of initial direct costs. We will make an accounting policy election to exclude leases with an initial term of twelve months or less from the Balance Sheet similar to existing guidance for operating leases under ASC 840. We are currently assessing the impact that the adoption of ASC 842 will have on our consolidated financial statements. We currently expect a material impact to the Consolidated Balance Sheet in recognizing additional lease liabilities of \$42.0 million to \$46.0 million and right-of-use assets of \$33.0 million to \$37.0 million as of September 28, 2019, primarily related to our operating leases. We will provide enhanced disclosures about our leasing arrangements in our consolidated financial statements for future periods. We do not expect that the new standard will have a material impact on our Consolidated Statements of Operations or Cash Flows.

In June 2016, the FASB issued ASU 2016-13, *Measurement of Credit Losses on Financial Instruments*. This update amends the guidance on reporting credit losses for assets held at amortized cost basis and available for sale debt securities. For available for sale debt securities, credit losses should be measured in a manner similar to current GAAP; however, this update will require that credit losses be presented as an allowance rather than as a write-down. ASU 2016-13 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. We are evaluating the effect that the updated standard will have on our consolidated financial statements and related disclosures.

3. REVENUE

Disaggregation of Revenue

We disaggregate revenue from contracts with customers by markets and geography, as we believe it best depicts how the nature, amount, timing and uncertainty of revenue and cash flows are affected by economic factors.

The following tables present our revenue disaggregated by markets and geography (in thousands):

	Fiscal Years		
	2019	2018	2017
Telecom	\$ 180,938	\$ 222,940	\$ 340,022
Data Center	114,132	162,098	172,481
Industrial & Defense	204,638	185,360	186,269
Total	\$ 499,708	\$ 570,398	\$ 698,772

<u>Revenue by Geographic Region</u>	Fiscal Years		
	2019	2018	2017
United States	\$ 239,510	\$ 272,951	\$ 265,038
China	132,329	159,763	206,136
Asia Pacific, excluding China (1)	80,136	79,581	170,826
Other Countries (2)	47,733	58,103	56,772
Total	\$ 499,708	\$ 570,398	\$ 698,772

(1) Asia Pacific represents Taiwan, Japan, Singapore, India, Thailand, South Korea, Australia, Malaysia, New Zealand and the Philippines.

(2) No international country or region represented greater than 10% of the total revenue as of the dates presented, other than China and the Asia Pacific region as presented above.

Contract Balances

We record contract assets or contract liabilities depending on the timing of revenue recognition, billings and cash collections on a contract-by-contract basis. Our contract liabilities primarily relate to deferred revenue, including advance consideration received from customers for contracts prior to the transfer of control to the customer, and therefore revenue is recognized upon delivery of products and services or as the services are performed.

The following table presents the changes in contract liabilities during fiscal year 2019 (in thousands):

	September 27, 2019	September 28, 2018	\$ Change	% Change
Contract liabilities	\$ 10,653	\$ 7,757	\$ 2,896	37%

As of September 27, 2019, approximately \$8.5 million of our contract liabilities were recorded as other long-term liabilities on our Balance Sheet with the remainder recorded as deferred revenue. The increase in contract liabilities during the fiscal year ended September 27, 2019 was primarily from the deferral of revenue for funds received prior to when certain of our customers obtain control of the product or services, partially offset by the recognition of \$7.0 million associated with a license contract.

During the fiscal year ended September 27, 2019, we recognized the following net sales as a result of changes in the contract liabilities balance (in thousands):

	September 27, 2019
Net revenue recognized in the period from:	
Amounts included in contract liabilities at the beginning of the period	\$ 7,646

4. ACQUISITIONS

Acquisition of Applied Micro Circuits Corporation— On January 26, 2017, we completed the acquisition of Applied Micro Circuits Corporation ("AppliedMicro"), a global provider of silicon solutions for next-generation cloud infrastructure and Cloud Data Centers, as well as connectivity products for edge, metro and long-haul communications equipment (the "AppliedMicro Acquisition"). We acquired AppliedMicro in order to expand our business in enterprise and Cloud Data Center applications. In connection with the AppliedMicro Acquisition, we acquired all of the outstanding common stock of AppliedMicro for total consideration of \$695.4 million, which included cash paid of \$287.1 million, less \$56.8 million of cash acquired, and equity issued at a fair value of \$465.1 million. In conjunction with the equity issued, we granted vested out-of-the-money stock options and unvested restricted stock units to replace outstanding vested out-of-the-money stock options and unvested restricted stock units of AppliedMicro. The total fair value of granted vested out-of-the-money stock options and unvested restricted stock units was \$14.5 million, of which \$9.3 million was attributable to pre-combination service and was included in the total consideration transferred. We funded the AppliedMicro Acquisition with cash on hand and short-term investments. There were no transaction costs for the fiscal years ended September 27, 2019 and September 28, 2018, and during the fiscal year ended September 29, 2017, we recorded transaction costs of \$11.9 million. We recorded transaction costs related to the acquisition in selling, general and administrative expense, except for \$1.0 million related to equity issuance costs that were recorded to additional paid-in capital. The AppliedMicro Acquisition was accounted for as a stock purchase and the operations of AppliedMicro have been included in our consolidated financial statements since the date of acquisition.

We recognized the AppliedMicro assets acquired and liabilities assumed based upon the fair value of such assets and liabilities measured as of the date of acquisition. The aggregate purchase price for AppliedMicro has been allocated to the tangible and identifiable intangible assets acquired and liabilities assumed based on their estimated fair value at the date of acquisition. The excess of the purchase price over the fair value of the acquired net assets represents cost and revenue synergies specific to the Company, as well as non-capitalizable intangible assets, such as the employee workforce acquired, and has been allocated to goodwill, none of which will be tax deductible.

In connection with the acquisition of AppliedMicro, we entered into a plan to divest a portion of AppliedMicro's business specifically related to its compute business (the "Compute business"). The divestiture of the Compute business was completed on October 27, 2017. See *Note 23 - Divested Business and Discontinued Operations* for further details of the divestiture.

The following table summarizes the total estimated acquisition consideration (in thousands):

Cash consideration paid to AppliedMicro common stockholders	\$ 287,060
Common stock issued (9,544,125 shares of our common stock at \$47.53 per share)	453,632
Equity consideration for vested "in-the-money" stock options and unvested restricted stock units	2,143
Fair value of the replacement equity awards attributable to pre-acquisition service	9,307
Total consideration paid, less cash acquired	\$ 752,142

We finalized the purchase accounting during the fiscal quarter ended December 29, 2017. The final purchase price allocation is as follows (in thousands):

	Final Allocation
Current assets	\$ 69,881
Intangible assets	412,848
Assets held for sale	40,944
Other assets	9,800
Total assets acquired	533,473
Liabilities held for sale	4,444
Other liabilities	18,278
Total liabilities assumed	22,722
Net assets acquired	510,751
Consideration:	
Cash paid upon closing	230,298
Common stock issued	455,775
Equity instruments issued	9,307
Total consideration	\$ 695,380
Goodwill	\$ 184,629

The components of the acquired intangible assets were as follows (in thousands):

	Included In Assets Held For Sale	Included In Retained Business	Useful Lives (Years)
Developed technology	\$ 9,600	\$ 78,448	7 years
Customer relationships	—	334,400	14 years
	\$ 9,600	\$ 412,848	

The following is a summary of AppliedMicro revenue and earnings included in our accompanying Consolidated Statements of Operations for the fiscal year ended September 29, 2017 (in thousands):

	Amount
Revenue	\$ 110,117
Loss from continuing operations	(27,222)
Loss from discontinued operations	(44,599)

The pro forma statements of operations data for the fiscal year ended September 29, 2017, below, gives effect to the AppliedMicro Acquisition, described above, as if it had occurred at October 2, 2015. These amounts have been calculated after applying our accounting policies and adjusting the results of AppliedMicro to reflect transaction costs, retention compensation expense, the impact of the step-up to the value of acquired inventory, as well as the additional intangible amortization that would have been charged assuming the fair value adjustments had been applied and incurred since October 2, 2015. This pro forma data is presented for informational purposes only and does not purport to be indicative of our future results of operations.

	Fiscal Year Ended September 29, 2017
Revenue	\$ 755,728
Loss from continuing operations	(104,828)
Loss from discontinued operations	(43,734)

Acquisition of Assets of Picometrix LLC— On August 9, 2017, we completed the acquisition of certain assets of Picometrix LLC ("Picometrix"), a supplier of optical-to-electrical converters for Cloud Data Center infrastructure (the "Picometrix Acquisition"). We acquired Picometrix in order to expand our business in enterprise and Cloud Data Center applications. The purchase consideration was \$33.5 million, comprised of an upfront cash payment of \$29.5 million, and \$4.0 million placed in escrow for potential satisfaction of certain indemnification obligations that may arise from the closing date through December 15, 2018. For the fiscal years ended September 27, 2019 and September 28, 2018, we recorded no transaction costs. For the fiscal year ended September 29, 2017, we recorded transaction costs of \$0.2 million in selling, general and administrative expense. The Picometrix Acquisition was accounted for as an asset purchase business combination, and the operations of Picometrix have been included in our consolidated financial statements since the date of acquisition.

We recognized the Picometrix assets acquired based upon the fair value of such assets measured as of the date of acquisition. The aggregate purchase price for the Picometrix assets has been allocated to the tangible and identifiable intangible assets acquired based on their estimated fair value at the date of acquisition. The excess of the purchase price over the fair value of the acquired assets represents cost and revenue synergies specific to the Company, as well as non-capitalizable intangible assets, such as the employee workforce acquired, and has been allocated to goodwill, all of which will be tax deductible.

We finalized the purchase accounting during the fiscal quarter ended June 29, 2018. The final purchase price allocation is as follows (in thousands):

	Final Allocation
Current assets	\$ 6,287
Intangible assets	19,000
Other assets	3,220
Total assets acquired	28,507
Current liabilities	2,311
Other liabilities	465
Total liabilities assumed	2,776
Net assets acquired	25,731
Consideration:	
Cash paid upon closing, net of cash acquired	33,500
Goodwill	\$ 7,769

The pro forma financial information for fiscal year 2017, including revenue and net income, is immaterial, and has not been separately presented.

Other Acquisitions— On July 31, 2017, we completed the acquisition of certain assets of Antario Technologies, Inc. ("Antario") a privately-held company based in Taiwan and in California. The total cash consideration was approximately \$5.8 million, of which \$4.8 million was paid upon closing, and approximately \$1.0 million was withheld for potential satisfaction of certain indemnification obligations that may arise from the closing date through July 31, 2018. We finalized the purchase accounting during the fiscal quarter ended December 29, 2017, which resulted in goodwill of \$1.6 million and intangible assets, including acquired technology and customer relationships, of \$4.1 million. The Antario transaction was accounted for as an asset purchase business combination and the operations have been included in our consolidated financial statements since the acquisition date. Pro forma financial disclosures are not presented herein as the financial results of Antario are considered immaterial.

On May 26, 2017, we completed the acquisition of Triple Play Communications Corporation ("TPC") a privately-held company based in Melbourne, Florida. The total cash consideration was approximately \$2.6 million, of which \$2.2 million was paid upon closing, and approximately \$0.4 million was withheld for potential satisfaction of certain indemnification obligations from the closing date through November 23, 2018. We finalized the purchase accounting during the fiscal quarter ended December 29, 2017, which resulted in goodwill of \$3.7 million and intangible assets, including customer relationships, of \$0.2 million. TPC was accounted for as a stock purchase business combination and the operations have been included in our consolidated financial statements since the acquisition date. Pro forma financial disclosures are not presented herein as the financial results of TPC are considered immaterial.

5. INVESTMENTS

All investments are short-term in nature and are invested in corporate bonds and commercial paper, and are classified as available-for-sale. The amortized cost, gross unrealized holding gains or losses and fair value of our available-for-sale investments by major investments type as of September 27, 2019 and September 28, 2018 are summarized in the tables below (in thousands):

	September 27, 2019			
	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Aggregate Fair Value
Corporate bonds	\$ 29,578	\$ 112	\$ (93)	\$ 29,597
Commercial paper	71,646	1	(18)	71,629
Total investments	\$ 101,224	\$ 113	\$ (111)	\$ 101,226

	September 28, 2018			
	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Aggregate Fair Value
Corporate bonds	\$ 28,731	\$ —	\$ (460)	\$ 28,271
Commercial paper	69,966	—	(16)	69,950
Total investments	\$ 98,697	\$ —	\$ (476)	\$ 98,221

The contractual maturities of available-for-sale investments were as follows (in thousands):

	September 27, 2019
Less than 1 year	\$ 75,233
Over 1 year	25,993
Total investments	\$ 101,226

Available-for-sale investments are reported at fair value and as such, their associated unrealized gains and losses are reported as a separate component of stockholders' equity within accumulated other comprehensive income (loss).

We have determined that the gross unrealized losses on available for sale securities at September 27, 2019 and September 28, 2018 are temporary in nature. We review our investments to identify and evaluate investments that have indications of possible impairment. The techniques used to measure the fair value of our investments are described in *Note 6 - Fair Value*. Factors considered in determining whether a loss is temporary include the length of time and extent to which fair value has been less than the cost basis, the financial condition and near-term prospects of the investee, and our intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value. Substantially all of our fixed income securities are rated investment grade or better.

We received proceeds from sales of available-for-sale securities of \$173.0 million and \$100.4 million during the fiscal years 2019 and 2018, respectively. Such sales resulted in gross realized gains of \$0.2 million and less than \$0.1 million and gross realized losses of \$0.2 million and \$0.3 million during the fiscal years ended September 27, 2019 and September 28, 2018, respectively, which have been recorded within other expense.

Other Investments— As of September 27, 2019 and September 28, 2018 we held two non-marketable equity investments classified as other long-term investments.

One of these is a minority investment in a preferred stock ownership of a privately held manufacturing corporation with preferred liquidation rights over other equity shares. This investment had a value of \$5.0 million at the date of purchase and approximates the then current fair value. Since we do not have the ability to exercise significant influence or control over the investee we account for this investment at cost, which we evaluate for impairment at each balance sheet date and through September 27, 2019 no impairment has been recorded for this investment.

In addition, we have a minority investment of less than 20.0% of the outstanding equity of a privately held limited liability corporation ("Compute"). This investment was acquired in conjunction with the divestiture of the Compute business during the fiscal quarter ended December 29, 2017, had an initial value of \$36.5 million and is accounted for using the equity method. We have no obligation to provide further funding to Compute. This investment value is updated quarterly based on our proportionate share of the losses or earnings of Compute, as well as any changes in Compute's equity, utilizing the equity method. During fiscal years 2019 and 2018, we recorded \$7.5 million and \$10.4 million of losses associated with this investment as other expense in our Consolidated Statements of

Operations. The carrying value of this investment was \$18.6 million and \$26.1 million as of September 27, 2019 and September 28, 2018, respectively.

6. FAIR VALUE

We group our financial assets and liabilities measured at fair value on a recurring basis in three levels, based on the markets in which the assets and liabilities are traded and the reliability of the assumptions used to determine fair value. These levels are:

Level 1 - Quoted prices in active markets for identical assets or liabilities.

Level 2 - Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets with insufficient volume or infrequent transactions (less active markets) or model-driven valuations in which all significant inputs are observable or can be derived principally from, or corroborated with, observable market data.

Level 3 - Fair value is derived from valuation techniques in which one or more significant inputs are unobservable, including assumptions and judgments made by us.

Assets and Liabilities Measured and Recorded at Fair Value on a Recurring Basis

We measure certain assets and liabilities at fair value on a recurring basis such as our financial instruments. There have been no transfers between Level 1, 2 or 3 assets or liabilities during the fiscal year ended September 27, 2019.

Assets and liabilities measured at fair value on a recurring basis consist of the following (in thousands):

	September 27, 2019			
	Fair Value	Active Markets for Identical Assets (Level 1)	Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets				
Money market funds	\$ 261	\$ 261	\$ —	\$ —
Commercial paper	71,629	—	71,629	—
Corporate bonds	29,597	—	29,597	—
Total assets measured at fair value	<u>\$ 101,487</u>	<u>\$ 261</u>	<u>\$ 101,226</u>	<u>\$ —</u>
Liabilities				
Warrant liability	12,364	—	—	12,364
Total liabilities measured at fair value	<u>\$ 12,364</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 12,364</u>
	September 28, 2018			
	Fair Value	Active Markets for Identical Assets (Level 1)	Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets				
Money market funds	\$ 253	\$ 253	\$ —	\$ —
Commercial paper	69,950	—	69,950	—
Corporate bonds	28,271	—	28,271	—
Total assets measured at fair value	<u>\$ 98,474</u>	<u>\$ 253</u>	<u>\$ 98,221</u>	<u>\$ —</u>
Liabilities				
Contingent consideration	\$ 585	\$ —	\$ —	\$ 585
Warrant liability	13,129	—	—	13,129
Total liabilities measured at fair value	<u>\$ 13,714</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 13,714</u>

The quantitative information utilized in the fair value calculation of our Level 3 liabilities are as follows:

Liabilities	Valuation Technique	Unobservable Input	September 27, 2019	September 28, 2018
Contingent consideration	Discounted cash flow	Discount rate	N/A	9.2%
		Probability of achievement	N/A	90%
		Timing of cash flows	N/A	1 month
Warrant liability	Black-Scholes model	Volatility	61.4%	60.7%
		Discount rate	1.71%	2.81%
		Expected life	1.2 years	2.2 years
		Exercise price	\$14.05	\$14.05
		Stock price	\$21.68	\$20.60
		Dividend rate	—%	—%

The fair values of the contingent consideration liabilities were estimated based upon a risk-adjusted present value of the probability-weighted expected payments by us. Specifically, we considered base, upside and downside scenarios for the operating metrics upon which the contingent payments are to be based. Probabilities were assigned to each scenario and the probability-weighted payments were discounted to present value using risk-adjusted discount rates.

The changes in assets and liabilities with inputs classified within Level 3 of the fair value hierarchy consist of the following (in thousands):

	Fiscal Year 2019				
	September 28, 2018	Net Realized/Unrealized Losses (Gains) Included in Earnings	Purchases and Issuances	Sales and Settlements	September 27, 2019
Contingent consideration	\$ 585	\$ 65	\$ —	\$ (650)	\$ —
Warrant liability	\$ 13,129	\$ (765)	\$ —	\$ —	\$ 12,364
	Fiscal Year 2018				
	September 29, 2017	Net Realized/Unrealized Losses (Gains) Included in Earnings	Purchases and Issuances	Sales and Settlements	September 28, 2018
Contingent consideration	\$ 1,679	\$ (394)	\$ —	\$ (700)	\$ 585
Warrant liability	\$ 40,775	\$ (27,646)	\$ —	\$ —	\$ 13,129
	Fiscal Year 2017				
	September 30, 2016	Net Realized/Unrealized Losses (Gains) Included in Earnings	Purchases and Issuances	Sales and Settlements	September 29, 2017
Contingent consideration	\$ 848	\$ 180	\$ 1,701	\$ (1,050)	\$ 1,679
Warrant liability	\$ 38,253	\$ 2,522	\$ —	\$ —	\$ 40,775

7. ACCOUNTS RECEIVABLES ALLOWANCES

Summarized below is the activity in our accounts receivable allowances including compensation credits and doubtful accounts as follows (in thousands):

	Fiscal Year		
	2019	2018	2017
Balance - beginning of year	\$ 6,795	\$ 9,410	\$ 3,279
Provision, net	11,989	15,465	29,512
Charge-offs	(13,737)	(18,080)	(23,381)
Balance - end of year	\$ 5,047	\$ 6,795	\$ 9,410

The balances at the end of fiscal years 2019, 2018 and 2017 are comprised primarily of compensation credits of \$4.5 million, \$6.3 million and \$8.9 million, respectively.

8. INVENTORIES

Inventories consist of the following (in thousands):

	September 27, 2019	September 28, 2018
Raw materials	\$ 59,184	\$ 71,408
Work-in-process	13,799	13,466
Finished goods	34,897	37,963
Total	\$ 107,880	\$ 122,837

9. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consists of the following (in thousands):

	September 27, 2019	September 28, 2018
Construction in process	24,848	49,661
Machinery and equipment	175,696	174,638
Leasehold improvements	12,962	14,984
Furniture and fixtures	3,716	2,306
Capital lease assets	46,496	19,380
Computer equipment and software	18,116	17,317
Total property and equipment	281,834	278,286
Less accumulated depreciation and amortization	(149,187)	(128,363)
Property and equipment — net	\$ 132,647	\$ 149,923

Depreciation and amortization expense related to property and equipment for fiscal years 2019, 2018 and 2017 was \$29.7 million, \$30.7 million and \$27.3 million, respectively. Accumulated depreciation on capital lease assets for fiscal years 2019 and 2018 was \$5.3 million and \$3.2 million, respectively.

See *Note 17 - Impairments* and *Note 15 - Restructurings* for information related to property and equipment impaired during fiscal year 2019.

10. DEBT

As of September 27, 2019, we are party to a credit agreement dated as of May 8, 2014 with a syndicate of lenders and Goldman Sachs Bank USA ("Goldman Sachs"), as administrative agent (as amended on February 13, 2015, August 31, 2016, March 10, 2017, May 19, 2017, May 2, 2018 and May 9, 2018, the "Credit Agreement").

As of September 27, 2019, the Credit Agreement consisted of term loans with an original principal amount of \$700.0 million ("Term Loans") and a revolving credit facility with an aggregate, undrawn borrowing capacity of \$160.0 million ("Revolving Facility"). The Revolving Facility will mature in November 2021 and the Term Loans will mature in May 2024 and bear interest at: (i) for LIBOR loans for any interest period, a rate per annum equal to the LIBOR rate as determined by the administrative agent, plus an applicable margin of 2.25%; and (ii) for base rate loans, a rate per annum equal to the greater of (a) the prime rate quoted in the print edition of

the Wall Street Journal, Money Rates Section, (b) the federal funds rate plus one-half of 1.00% and (c) the LIBOR rate applicable to a one-month interest period plus 1.00% (but, in each case, not less than 1.00%), plus an applicable margin of 1.25%.

All principal amounts outstanding and interest rate information as of September 27, 2019, for the Credit Agreement were as follows (in thousands, except rate data):

	Principal Outstanding	LIBOR Rate	Margin	Effective Interest Rate
Term loans	\$672,971	2.11%	2.25%	4.36%

As of September 27, 2019, approximately \$8.0 million of deferred financing costs remain unamortized, of which \$7.4 million is related to the Term Loans and is recorded as a direct reduction of the recognized debt liabilities in our accompanying Consolidated Balance Sheet, and \$0.6 million is related to the Revolving Facility and is recorded in other long-term assets in our accompanying Consolidated Balance Sheet.

The Term Loans and Revolving Facility are secured by a first priority lien on substantially all of our assets and provide that we must comply with certain financial and non-financial covenants.

The Term Loans are payable in quarterly principal installments of approximately \$1.7 million on the last business day of each calendar quarter, with the remainder due on the maturity date. In the event that we divest a business, the net cash proceeds of the divestment are generally required, subject to certain exceptions, to be applied to repayment of outstanding Term Loans except to the extent we reinvest such proceeds in assets useful for our business within 18 months of receiving the proceeds. If we enter into a binding agreement to reinvest such proceeds within 18 months of receiving them, we have until the later of 18 months following our receipt of the proceeds and six months following the date of such agreement to complete the reinvestment.

As of September 27, 2019, we had \$160.0 million of borrowing capacity under our Revolving Facility.

As of September 27, 2019, the following remained outstanding on the Term Loans:

	September 27, 2019
Principal balance	\$ 672,971
Unamortized discount	(3,414)
Unamortized deferred financing costs	(7,400)
Total term loans	662,157
Current portion	6,885
Long-term, less current portion	\$ 655,272

As of September 27, 2019, the minimum principal payments under the Term Loans in future fiscal years were as follows (in thousands):

Fiscal year ending:	Amount
2020	\$ 6,885
2021	6,885
2022	6,885
2023	6,885
2024	645,431
Total	\$ 672,971

The fair value of the Term Loans was estimated to be approximately \$585.5 million as of September 27, 2019 and was determined using Level 2 inputs, including a quoted price from a bank.

11. CAPITAL LEASE AND FINANCING OBLIGATIONS

Corporate Facility Financing Obligation

On December 28, 2016, we entered into three lease agreements including: (1) a 20-year leaseback of the facility located at 100 Chelmsford Street, (2) a 20-year build-to-suit lease arrangement for the construction and subsequent lease back of a new facility to be located at 144 Chelmsford Street, and (3) a 14-year building lease renewal of an adjacent facility at 121 Hale Street (collectively, the "Lowell Leases"). We account for the Lowell Leases as a single unit of accounting under the financing method. As of October 1, 2018, the construction of the facility at 144 Chelmsford Street was completed, the building was placed in service and the associated lease term commenced.

We calculated a lease obligation based on the future minimum lease payments discounted at 7.2%. The discount rate represents the estimated incremental borrowing rate over the lease term of 20 years. The minimum lease payments are recorded as interest expense and in part as a payment of principal reducing the lease obligation. The real property assets in the transaction remain on the Consolidated Balance Sheets and continue to be depreciated over their remaining useful lives. As of September 27, 2019 and September 28, 2018, the outstanding lease obligations associated with the Lowell Leases included in leases payable in the Consolidated Balance Sheets were \$28.2 million and \$28.3 million, respectively.

Additionally, we have capital equipment lease obligations, of which approximately \$2.3 million and \$1.2 million were outstanding as of September 27, 2019 and September 28, 2018, respectively.

As of September 27, 2019, future minimum payments under capital lease obligations related to all of our in service leases were as follows (in thousands):

Fiscal year ending:	Amount
2020	\$ 3,299
2021	3,343
2022	2,884
2023	2,816
2024	2,853
Thereafter	39,927
Total minimum capital lease payments	\$ 55,122
Less amount representing interest	(26,241)
Present value of net minimum capital lease payments	\$ 28,881

12. EMPLOYEE BENEFIT PLANS

We established a defined contribution savings plan under Section 401(k) of the Internal Revenue Code of 1986, as amended on October 1, 2009 ("401(k) Plan"). The 401(k) Plan follows a calendar year, covers substantially all U.S. employees who meet minimum age and service requirements and allows participants to defer a portion of their annual compensation on a pretax basis, subject to legal limitations. Our contributions to the 401(k) Plan may be made at the discretion of the board of directors. During the fiscal year ended September 27, 2019, we contributed \$2.6 million to our 401(k) Plan for calendar year 2018. As of September 27, 2019 there were no contributions made by us to the 401(k) Plan for calendar year 2019. During the fiscal year ended September 28, 2018, we contributed \$2.7 million to our 401(k) Plan for calendar year 2017. During the fiscal year ended September 29, 2017, we contributed \$2.4 million to our 401(k) Plan for calendar year 2016.

Our employees located in foreign jurisdictions meeting minimum age and service requirements participate in defined contribution plans whereby participants may defer a portion of their annual compensation on a pretax basis, subject to legal limitations. Company contributions to these plans are discretionary and vary per region. We expensed contributions of \$1.1 million, \$1.2 million and \$1.3 million for fiscal years 2019, 2018 and 2017, respectively.

13. ACCRUED LIABILITIES

Accrued liabilities consist of the following (in thousands):

	September 27, 2019	September 28, 2018
Compensation and benefits	\$ 20,455	\$ 22,935
Distribution costs	7,797	10,670
Product warranty	3,273	5,756
Restructuring costs	2,527	89
Professional fees	1,554	1,875
Rent and utilities	701	1,660
Income taxes payable	1,233	415
Contingent consideration	—	585
Purchase price holdback	—	375
Other	2,368	5,585
Total	<u>\$ 39,908</u>	<u>\$ 49,945</u>

14. COMMITMENTS AND CONTINGENCIES

Operating Leases—We have non-cancelable operating lease agreements for office, research and development and manufacturing space in the United States and foreign locations. We also have operating leases for certain equipment and services in the United States and foreign jurisdictions. These lease agreements expire at various dates through 2029, and certain agreements contain provisions for extension at substantially the same terms as currently in effect. Lease escalation clauses, rent abatements and/or concessions, such as rent holidays and landlord or tenant incentives or allowances, are typically included in the determination of straight-line rent expense over the lease term.

Future minimum lease payments for the next five fiscal years as of September 27, 2019, are as follows (in thousands):

Fiscal year ending:	Amount
2020	\$ 9,987
2021	9,233
2022	7,447
2023	6,061
2024	5,564
Thereafter	16,437
Total minimum lease payments	<u>\$ 54,729</u>

Rent expense incurred under non-cancelable operating leases was \$9.7 million, \$9.5 million and \$10.9 million in fiscal years 2019, 2018 and 2017, respectively.

Asset Retirement Obligations—We are obligated under certain facility leases to restore those facilities to the condition in which we or our predecessors first occupied the facilities. We are required to remove leasehold improvements and equipment installed in these facilities prior to termination of the leases. As of the end of fiscal years 2019 and 2018, the estimated costs for the removal of these assets are recorded as asset retirement obligations in other long-term liabilities were \$1.8 million and \$1.8 million, respectively.

Purchase Commitments—As of September 27, 2019, we had outstanding non-cancelable purchase commitments aggregating to \$40.6 million primarily for purchases of capital equipment, services and inventory supply arrangements.

Litigation—From time to time we may be subject to commercial disputes, employment issues, claims by other companies in the industry that we have infringed their intellectual property rights and other similar claims and litigations. Any such claims may lead to future litigation and material damages and defense costs. We were not involved in any material pending legal proceedings during the year ended September 27, 2019.

15. RESTRUCTURINGS

We have periodically implemented restructuring actions in connection with broader plans to reduce staffing, our internal manufacturing footprint and overall operating costs. The restructuring expenses are primarily comprised of direct and incremental costs related to headcount reductions including severance and outplacement fees for the terminated employees, as well as facility closure costs.

The following is a summary of the restructuring charges incurred for the periods presented (in thousands):

	Fiscal Years		
	2019	2018	2017
Employee-related expenses	\$ 8,084	\$ 2,789	\$ 2,744
Facility-related expenses	11,459	3,476	—
Total restructuring expenses	\$ 19,543	\$ 6,265	\$ 2,744

The following is a summary of the costs incurred and remaining balances included in accrued expenses related to restructuring actions taken (in thousands):

	Employee-Related Expense ⁽¹⁾	Facility-Related Expense ⁽²⁾	Total
Balance - September 29, 2017	\$ 627	\$ —	\$ 627
Charges	2,789	3,476	6,265
Charges paid/settled	(3,327)	(3,476)	(6,803)
Balance - September 28, 2018	\$ 89	\$ —	\$ 89
Charges	8,084	11,459	19,543
Charges paid/settled	(6,624)	(10,481)	(17,105)
Balance - September 27, 2019	\$ 1,549	\$ 978	\$ 2,527

(1) Primarily includes severance charges associated with the reduction of our workforce in certain facilities.

(2) Primarily includes activities associated with the closure of certain facilities, including any associated asset impairments and contract termination costs.

Long Beach, Belfast and Sydney Plan

During the fiscal quarter ended December 29, 2017, we initiated plans to restructure and close our facilities in Long Beach, California, Belfast, United Kingdom and Sydney, Australia (the "Long Beach, Belfast and Sydney Plan"). The operations from the Long Beach facility were consolidated into our other California locations in order to achieve operational synergies. The Belfast and Sydney facilities were closed as we discontinued certain product development activities that were performed in those locations. During the fiscal year ended September 28, 2018, we incurred \$6.3 million, including \$2.8 million of employee-related costs and \$3.5 million of facility-related costs and the charges paid were \$6.2 million. During the fiscal year ended September 27, 2019 we incurred no charges for this plan. This action was complete in fiscal 2018 and no further costs will be incurred.

Details of the Long Beach, Belfast and Sydney Plan activities during fiscal years ended September 28, 2018 and September 27, 2019 are as follows:

	Employee-Related Expense	Facility-Related Expense	Total
Balance - September 29, 2017	\$ —	\$ —	\$ —
Charges	2,789	3,476	6,265
Charges paid/settled	(2,700)	(3,476)	(6,176)
Balance - September 28, 2018	\$ 89	\$ —	\$ 89
Charges	—	—	—
Charges paid/settled	(89)	—	(89)
Balance - September 27, 2019	\$ —	\$ —	\$ —

Ithaca Plan

During the fiscal quarter ended December 28, 2018, we commenced a plan to exit certain production and product lines, primarily related to certain production facilities located in Ithaca, New York (the "Ithaca Plan"). For these facilities, we incurred \$5.5 million of restructuring charges in the fiscal year ended September 27, 2019, including \$1.5 million of employee-related costs and \$4.0 million of facility-related costs. This action was complete in fiscal 2019 and no further costs will be incurred. The remaining charges are expected to be paid in the first quarter of fiscal year 2020.

Details of the Ithaca Plan activities during fiscal year ended September 27, 2019 are as follows:

	Employee-Related Expense	Facility-Related Expense	Total
Balance - September 28, 2018	\$ —	\$ —	\$ —
Charges	1,481	3,969	5,450
Charges paid/settled	(1,468)	(3,899)	(5,367)
Balance - September 27, 2019	<u>\$ 13</u>	<u>\$ 70</u>	<u>\$ 83</u>

Design Facilities Plan

During the fiscal quarter ended March 29, 2019, we committed to a plan to exit certain design facilities and activities (the "Design Facilities Plan"). We incurred restructuring charges of \$2.5 million in the fiscal year ended September 27, 2019, including \$0.3 million of employee-related costs and \$2.2 million of facility-related costs. This action was complete in fiscal 2019 and no further costs will be incurred. The remaining charges are expected to be paid in fiscal year 2020.

Details of the Design Facilities Plan activities during fiscal year ended September 27, 2019 are as follows:

	Employee-Related Expense	Facility-Related Expense	Total
Balance - September 28, 2018	\$ —	\$ —	\$ —
Charges	338	2,190	2,528
Charges paid/settled	(338)	(1,739)	(2,077)
Balance - September 27, 2019	<u>\$ —</u>	<u>\$ 451</u>	<u>\$ 451</u>

2019 Plan

During the fiscal quarter ended June 28, 2019, we committed to a plan to strategically realign, streamline and improve certain of our business and operations, including reducing our workforce by approximately 250 employees and exiting seven development facilities in France, Japan, the Netherlands, Florida, Massachusetts, New Jersey and Rhode Island (the "2019 Plan"). We also committed to reducing certain development activities for one of our product lines. Additionally, we decided to no longer invest in the design and development of optical modules and subsystems for Data Center applications. Total restructuring charges expected to be incurred in connection with this plan are approximately \$14.1 million to \$15.0 million. We incurred restructuring charges of \$11.6 million in the fiscal year ended September 27, 2019 under the 2019 Plan, including \$6.3 million of employee-related costs, \$4.0 million of impairment expense for fixed assets and \$1.3 million of other facility-related costs. The remaining charges are expected to be paid in fiscal year 2020. We expect to incur restructuring costs of approximately \$2.5 million to \$3.4 million through fiscal year 2020 as we complete this restructuring action, including approximately \$2.6 million of employee-related costs and \$0.8 million of facility-related costs.

Details of the 2019 Plan activities during fiscal year ended September 27, 2019 are as follows:

	Employee-Related Expense	Facility-Related Expense	Total
Balance - September 28, 2018	\$ —	\$ —	\$ —
Charges	6,265	5,300	11,565
Charges paid/settled	(4,729)	(4,843)	(9,572)
Balance at September 27, 2019	<u>\$ 1,536</u>	<u>\$ 457</u>	<u>\$ 1,993</u>

16. PRODUCT WARRANTIES

We establish a product warranty liability at the time of revenue recognition. Product warranties generally have terms of 12 months and cover nonconformance with specifications and defects in material or workmanship. For sales to distributors, our warranty generally begins when the product is resold by the distributor. The liability is based on estimated costs to fulfill customer product warranty obligations and utilizes historical product failure rates. Should actual warranty obligations differ from estimates, revisions to the warranty liability may be required.

Product warranty liability activity is as follows (in thousands):

	Fiscal Years		
	2019	2018	2017
Balance — beginning of year	\$ 5,756	\$ 3,672	\$ 1,039
(Divested)/acquired	—	(49)	952
Provisions/(expense)	(3,053)	1,865	1,737
Direct charges/(payments)	570	268	(56)
Balance — end of year	<u>\$ 3,273</u>	<u>\$ 5,756</u>	<u>\$ 3,672</u>

17. IMPAIRMENTS

During fiscal year 2019, we initiated a plan to strategically realign, streamline and improve our operations, including reducing our workforce and exiting certain product offerings and research and development facilities. See *Note 15 - Restructurings*, for additional information about the 2019 Plan. These activities led us to reassess our previous estimates for expected future revenue growth. We performed impairment analyses to determine whether our goodwill and long-lived assets, comprised of definite-lived intangible assets and property, plant and equipment, were recoverable. During the fiscal quarter ended June 28, 2019, we performed a goodwill impairment test for our consolidated reporting unit. We calculated the fair value of our reporting unit using market capitalization and compared its fair value to its carrying amount, including goodwill. The fair value exceeded the carrying amount, therefore we determined that goodwill of the reporting unit was not impaired. Based on the estimated undiscounted cash flow assessment for long-lived assets, we determined that for an asset group, the cash flows were not sufficient to recover the carrying value of the long-lived assets over their remaining useful lives. Accordingly, we recorded impairment charges of \$217.5 million and \$33.2 million to our customer relationship intangible assets and technology intangible assets, respectively, in the fiscal quarter ended June 28, 2019, based on the difference between the fair value and the carrying value of the long-lived assets. We will continue to monitor for events or changes in business circumstances that may indicate that the remaining carrying value of the asset group may not be recoverable. We used the income approach to determine the fair value of the definite-lived intangible assets and the cost approach to determine the fair value of our property, plant and equipment.

Additionally, in connection with the 2019 Plan, we determined that certain intangible assets were abandoned and would not have a future benefit. Accordingly, we recorded impairment charges of \$2.4 million and \$3.9 million to our customer relationship intangible assets and technology intangible assets, respectively, during fiscal year 2019.

During fiscal year 2019, we also abandoned equipment recorded as construction in process. Accordingly, we recorded impairment charges of \$7.8 million to reflect the estimated salvage value of the equipment.

Total impairment charges recorded on intangible assets and assets recorded as construction in process for fiscal year 2019 were \$264.8 million.

During fiscal year 2018, we recorded impairment charges of \$6.6 million related to property and equipment and other assets designated for future use with ZTE.

During fiscal year 2017, we completed an IPR&D project and placed the acquired technology into service. Prior to placing the technology into service we performed an impairment assessment, at which time we determined that the value of the technology was impaired by \$4.4 million, which was expensed in our fiscal fourth quarter of 2017. The remaining \$3.6 million was placed in service as acquired technology.

See *Note 15 - Restructurings* for information related to property and equipment impaired as part of our restructuring actions.

18. INTANGIBLE ASSETS

Amortization expense related to intangible assets is as follows (in thousands):

	Fiscal Years		
	2019	2018	2017
Cost of revenue	\$ 29,847	\$ 33,429	\$ 30,286
Selling, general and administrative	44,872	48,265	35,456
Total	<u>\$ 74,719</u>	<u>\$ 81,694</u>	<u>\$ 65,742</u>

Intangible assets consist of the following (in thousands):

	September 27, 2019	September 28, 2018
Acquired technology	\$ 179,682	\$ 251,673
Customer relationships	245,870	518,234
Trade name, indefinite lived	3,400	3,400
Total	428,952	773,307
Less accumulated amortization	(247,724)	(260,522)
Intangible assets — net	\$ 181,228	\$ 512,785

As of September 27, 2019, our estimated amortization of our intangible assets in future fiscal years, was as follows (in thousands):

	2020	2021	2022	2023	2024	Thereafter
Amortization expense \$	50,330	46,213	33,433	26,048	15,410	6,394

Accumulated amortization for the acquired technology and customer relationships was \$134.8 million and \$112.9 million, respectively, as of September 27, 2019, and \$140.0 million and \$120.5 million, respectively, as of September 28, 2018.

A summary of the activity in intangible assets and goodwill follows (in thousands):

	Gross Intangible Assets				Total Goodwill
	Total Intangibles	Acquired Technology	Customer Relationships	Trade Name	
Balance at September 29, 2017	\$ 811,703	\$ 251,655	\$ 556,648	\$ 3,400	\$ 313,765
Allocation to divested business	(39,285)	—	(39,285)	—	(2,560)
Fair value adjustment	—	—	—	—	2,790
Currency translation adjustments	889	18	871	—	81
Balance at September 28, 2018	773,307	251,673	518,234	3,400	314,076
Currency translation adjustments	270	270	—	—	651
Impairments of intangible assets	(344,625)	(72,261)	(272,364)	—	—
Balance at September 27, 2019	\$ 428,952	\$ 179,682	\$ 245,870	\$ 3,400	\$ 314,727

In connection with the impairment of certain customer relationships and acquired technology intangible assets in 2019, we revised the useful lives of these intangible assets to reflect the estimated period over which these assets are expected to contribute to future cash flows, resulting in weighted-average amortization periods for our customer relationships and acquired technology of nine years and seven years, respectively. See *Note 17 - Impairments*, for additional information related to the impairment of our intangible assets.

19. INCOME TAXES

Deferred income taxes reflect the net effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and amounts used for income tax purposes. The components of our deferred tax assets and liabilities are as follows (in thousands):

	September 27, 2019	September 28, 2018
Deferred tax assets (liabilities):		
Federal and foreign net operating losses and credits	\$ 263,199	\$ 321,982
Intangible assets	9,887	(94,929)
Property and equipment	(1,473)	(6,293)
Other non-current deferred tax assets	16,933	13,850
Deferred compensation	—	3,810
Deferred gain	—	6,575
Interest	7,170	—
Valuation allowance	(252,536)	(243,112)
Total deferred tax asset	\$ 43,180	\$ 1,883

As of September 27, 2019, we had \$923.4 million of gross federal net operating loss ("NOL") carryforwards consisting of \$479.2 million relating to the AppliedMicro Acquisition, \$158.9 million relating to our acquisition of Mindspeed Technologies, Inc. in 2013, \$26.2 million relating to our acquisition of BinOptics Corporation in 2014 and \$259.1 million relating to losses generated by MACOM. The federal NOL carryforwards will expire at various dates through 2037 for losses generated prior to the tax period ended September 28, 2018. For losses generated during the tax period ended September 28, 2018 and future years, the NOL carryforward period is infinite. The reported net operating loss carryforward includes any limitation under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, which applies to an ownership change as defined under Section 382.

The domestic and foreign income (loss) from continuing operations before taxes were as follows (in thousands):

	Fiscal Years		
	2019	2018	2017
United States	\$ (458,617)	\$ (145,851)	\$ (111,432)
Foreign	35,464	(9,384)	61,927
(Loss) income from operations before income taxes	<u>\$ (423,153)</u>	<u>\$ (155,235)</u>	<u>\$ (49,505)</u>

The components of the (benefit) provision for income taxes are as follows (in thousands):

	Fiscal Years		
	2019	2018	2017
Current:			
Federal	\$ 70	\$ (6,876)	\$ 100
State	36	(160)	225
Foreign	876	1,642	7,307
Current provision (benefit)	<u>982</u>	<u>(5,394)</u>	<u>7,632</u>
Deferred:			
Federal	(21,560)	75,428	(42,637)
State	12,907	(15,526)	(4,037)
Foreign	(41,108)	(24,652)	(466)
Change in valuation allowance	9,424	(51,329)	140,419
Deferred (benefit) provision	<u>(40,337)</u>	<u>(16,079)</u>	<u>93,279</u>
Total (benefit) provision	<u>\$ (39,355)</u>	<u>\$ (21,473)</u>	<u>\$ 100,911</u>

We recognize deferred tax assets to the extent that we believe that these assets are more likely than not to be realized. In making this determination, we consider available positive and negative evidence and factors that may impact the valuation of our deferred tax asset including results of recent operations, future reversals of existing taxable temporary differences, projected future taxable income, and tax-planning strategies. A significant piece of objective negative evidence evaluated was the cumulative U.S. loss incurred over the three-year period ended September 27, 2019 which we believe limited our ability to consider other subjective evidence, such as our projections for future growth.

Certain transaction- and integration-related expenses incurred in the U.S., associated primarily with the AppliedMicro Acquisition during the three months ended March 31, 2017, resulted for the first time in significant negative objective evidence in the form of adjusted cumulative losses in the U.S. over the past three-year period. This resulted in our determination that there was not sufficient objectively verifiable positive evidence to offset this negative objective evidence and we concluded that a full valuation allowance totaling \$93.5 million was required for our U.S. deferred tax assets as of September 29, 2017. In addition, a full valuation allowance was established against the U.S. deferred tax assets acquired in connection with the AppliedMicro Acquisition.

The \$252.5 million of valuation allowance as of September 27, 2019 relates primarily to federal and state NOLs, tax credit carryforwards and a partial valuation allowance on tax credits in Canada of \$19.0 million whose recovery is not considered more likely than not. The \$243.1 million of valuation allowance as of September 28, 2018 related primarily to federal and state NOLs, tax credit carryforwards and a partial valuation allowance on tax credits in Canada of \$13.6 million whose recovery is not considered more likely than not. The change during the fiscal year ended September 27, 2019 of \$9.4 million primarily relates to the reduction of our NOLs due to section 382 limitations, the changes in our temporary differences, and the lower U.S. federal tax rate.

Our effective tax rates differ from the federal and statutory rate as follows:

	Fiscal Years		
	2019	2018	2017
Federal statutory rate	21.0%	24.5%	35.0%
Foreign rate differential	1.6	5.1	31.9
State taxes net of federal benefit	0.9	0.8	0.2
Warrant liabilities	—	4.4	(1.8)
Change in valuation allowance	(2.4)	34.0	(270.0)
Research and development credits	1.4	9.0	12.8
Provision to return adjustments	0.3	8.3	(4.0)
Section 382 adjustment	(19.3)	—	—
Nondeductible compensation expense	(0.6)	1.4	(4.1)
Global Intangible Low Taxed Income	(2.9)	—	—
Nondeductible legal fees	—	0.9	(3.9)
2017 tax reform	—	(73.7)	—
Intra-entity license transfer	9.4	—	—
Other permanent differences	(0.1)	(0.9)	0.1
Effective income tax rate	9.3%	13.8%	(203.8)%

For fiscal years 2019, 2018 and 2017, the effective tax rates on \$423.2 million, \$155.2 million and \$49.5 million, respectively, of pre-tax loss from continuing operations were 9.3%, 13.8% and (203.8)%, respectively. For fiscal year 2019, the effective tax rate was primarily impacted by a change in our NOL carryforward due to an adjustment in our Section 382 limitation from a prior period acquisition and the immediate recognition of the current and deferred income tax effects totaling \$39.8 million from an intra-entity transfer of a license for intellectual property to a higher taxed jurisdiction that received a tax basis step-up. For fiscal year 2018, the effective tax rate was primarily impacted by the Tax Cuts and Jobs Act (the "Tax Act"). The effective income tax rates for fiscal years 2019, 2018 and 2017 were also impacted by a lower income tax rate in many foreign jurisdictions in which our foreign subsidiaries operate, changes in valuation allowance, research and development tax credits, and a fair market value adjustment of warrant liabilities.

All earnings of foreign subsidiaries, other than our M/A-COM Technology Solutions International Limited Cayman Islands subsidiary ("Cayman Islands subsidiary"), are considered indefinitely reinvested for the periods presented. During fiscal year 2019 we changed our position for our Cayman Islands subsidiary to no longer have its earnings permanently reinvested. Although a foreign subsidiary would typically have to accrue for foreign withholding tax liabilities associated with undistributed earnings, Cayman Islands has no withholding tax under domestic law, therefore, we did not accrue for foreign withholding tax. During fiscal year 2019 we finalized our calculation of the one-time deemed repatriation of gross foreign earnings and profits, totaling \$156.8 million, which resulted in approximately \$86.7 million in U.S. taxable income for the year ended September 28, 2018 with Grand Cayman and Ireland accounting for \$59.7 million and \$25.6 million, respectively. Due to the fact that we are in a full U.S. valuation allowance, this one-time deemed repatriation had no impact on our tax expense for fiscal year 2018.

Our fiscal year 2019 tax provision incorporated changes required by the Tax Act. Some of these changes include a new limitation on the deductible interest expense, inclusion of Global Intangible Low Taxed Income earned by controlled foreign corporations, computation of the new base erosion anti-abuse minimum tax, repealing the performance-based compensation exception to section 162(m) and revising the definition of a covered employee.

Activity related to unrecognized tax benefits is as follows (in thousands):

	Amount
Balance - September 29, 2017	(1,670)
Additions based on tax positions	—
Reductions based on tax positions	1,370
Balance - September 28, 2018	\$ (300)
Additions based on tax positions	—
Reductions based on tax positions	—
Balance at September 27, 2019	\$ (300)

The balance of the unrecognized tax benefit as of September 27, 2019, is included in other long-term liabilities in the accompanying Consolidated Balance Sheets. The entire balance of unrecognized tax benefits, if recognized, will reduce income tax expense.

It is our policy to recognize any interest and penalties accrued related to unrecognized tax benefits in income tax expense. During fiscal year 2019, we did not make any payment of interest and penalties. There was nothing accrued in the Consolidated Balance Sheets

for the payment of interest and penalties at September 27, 2019, as the remaining unrecognized tax benefits would only serve to reduce our current federal and state NOL carryforwards, if ultimately recognized.

A summary of the fiscal tax years that remain subject to examination, as of September 27, 2019, for the Company's significant tax jurisdictions are:

Jurisdiction	Tax Years Subject to Examination
United States—federal	2015 - forward
United States—various states	2015 - forward
Ireland	2016 - forward

Generally, we are no longer subject to federal income tax examinations for years before 2015, except to the extent of loss and tax credit carryforwards from those years.

20. SHARE-BASED COMPENSATION PLANS

Stock Plans

We have three equity incentive plans: the Amended and Restated 2009 Omnibus Stock Plan ("2009 Plan"), the 2012 Omnibus Incentive Plan, as amended ("2012 Plan") and the 2012 Employee Stock Purchase Plan, as amended and restated ("ESPP").

Upon the closing of our initial public offering, all shares that were reserved under the 2009 Plan but not awarded were assumed by the 2012 Plan. No additional awards will be made under the 2009 Plan. Under the 2012 Plan, we have the ability to issue incentive stock options ("ISOs"), nonqualified stock options ("NQs"), stock appreciation rights, restricted stock ("RSAs"), restricted stock units ("RSUs"), performance-based stock units ("PRSUs") and other equity-based awards to employees, directors and outside consultants. The ISOs and NQs must be granted at a price per share not less than the fair value of our common stock on the date of grant. Options granted to date primarily vest based on certain market-based and performance-based criteria as described below. Certain of the share-based awards granted and outstanding as of September 27, 2019, are subject to accelerated vesting upon a sale of the Company or similar changes in control. Options granted generally have a term of four to seven years.

As of September 27, 2019, we had 15.7 million shares available for future issuance under the 2012 Plan and 3.4 million shares available for issuance under our ESPP.

Outside of the three equity plans described above, we also grant incentive stock units ("ISUs") to certain of our international employees which typically vest over four years and for which the fair value is determined by our underlying stock price, which are classified as liabilities and settled in cash upon vesting. As of September 27, 2019, we had 195,598 ISU awards outstanding with a fair value of \$2.0 million recorded as an accrued compensation liability. As of September 28, 2018, we had approximately 191,620 ISU awards outstanding with a fair value of \$1.9 million recorded as an accrued compensation liability. During fiscal year 2019, 69,035 ISU awards vested and were paid at a fair value of \$1.2 million. We recorded an expense for these ISU awards of \$1.3 million in fiscal year 2019, primarily as a result of an increase in our stock price, and we recorded a gain of \$1.1 million and an expense of \$3.9 million in fiscal years 2018 and 2017, respectively.

Employee Stock Purchase Plan

The ESPP allows eligible employees to purchase shares of our common stock at a discount through payroll deductions of up to 15% of their eligible compensation, subject to any plan limitations. In administering the ESPP, the board of directors has limited discretion to set the length of the offering periods thereunder. As of September 27, 2019, total unrecognized compensation cost related to the ESPP was \$0.3 million. In fiscal years 2019, 2018 and 2017, 421,777, 305,851 and 146,149 shares of common stock were issued under the ESPP, respectively.

The 2012 Plan contains an "evergreen" provision, pursuant to which the number of shares of common stock available for issuance under the 2012 Plan can be increased on the first day of each fiscal year by the lesser of (a) 4.0% of outstanding common stock on a fully diluted basis as of the end of the immediately preceding fiscal year, (b) 1.9 million shares of common stock and (c) a lesser amount determined by the board of directors; provided, however, that any shares from any increases in previous years that are not actually issued will continue to be available for issuance under the 2012 Plan. The ESPP also contains an "evergreen" provision, pursuant to which the number of shares of common stock available for issuance under the ESPP can be increased on the first day of each fiscal year by the lesser of (a) 1.25% of outstanding common stock on a fully diluted basis as of the end of the immediately preceding fiscal year, (b) 550,000 shares of common stock and (c) a lesser amount determined by the board of directors; provided, however, that any shares from any increases in previous years that are not actually issued will continue to be available for issuance under the ESPP. In fiscal year 2019, pursuant to the evergreen provisions, the number of shares of common stock available for issuance under the 2012 Plan and the ESPP were increased by 1.9 million shares and 550,000 shares, respectively.

Share-Based Compensation

The following table shows a summary of share-based compensation expense included in the Consolidated Statements of Operations during the periods presented (in thousands):

	Fiscal Years		
	2019	2018	2017
Cost of revenue	\$ 2,936	\$ 3,869	\$ 3,189
Research and development	8,551	13,448	10,565
Selling, general and administrative	12,305	14,620	22,581
Total	\$ 23,792	\$ 31,937	\$ 36,335

Amounts presented above include share-based compensation expense of \$0.8 million for fiscal year 2017, which is recorded as discontinued operations related to employees of our Compute business.

As of September 27, 2019, the total unrecognized compensation costs related to outstanding stock options, restricted stock awards and units including awards with time-based, performance-based, and market-based vesting was \$47.0 million, which we expect to recognize over a weighted-average period of 2.9 years.

Stock Options

A summary of stock option activity for fiscal year 2019 is as follows (in thousands, except per share amounts and contractual term):

	Number of Shares	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Term (in Years)	Aggregate Intrinsic Value
Options outstanding - September 28, 2018	1,408	\$ 32.05		
Granted	585	15.44		
Exercised	(119)	13.48		
Forfeited, canceled or expired	(1,497)	31.68		
Options outstanding - September 27, 2019	376	\$ 13.58	7.03	\$ 3,046
Options vested and expected to vest - September 27, 2019	376	\$ 13.58	7.03	\$ 3,046
Options exercisable - September 27, 2019	91	\$ 9.82	2.48	\$ 1,081

Aggregate intrinsic value represents the difference between our closing stock price on September 27, 2019, and the exercise price of outstanding, in-the-money options. The total intrinsic value of options exercised was \$0.7 million, \$0.9 million and \$8.9 million for fiscal years 2019, 2018 and 2017, respectively.

Stock Options with Time-based Vesting Criteria

In November 2017, we granted 10,924 incentive stock options and 69,076 non-qualified stock options with a total grant date fair value of \$17.55 per share, or \$1.4 million. These stock options were valued using a Black-Scholes model, using a volatility rate of 45.7%, a risk-free rate of 2.21%, a strike price of \$36.61 and an expected term of 6.5 years. Share-based compensation expense is recognized on a straight-line basis over the service period which approximated 4.5 years for these awards. These awards were included in the cancellation during the fiscal first quarter of 2019 as discussed in the section below.

Stock Options with Market-based Vesting Criteria

We grant NQs that are subject to vesting only upon the market price of our underlying public stock closing above a certain price target within seven years of the date of grant. Share-based compensation expense is recognized regardless of the number of awards that are earned based on the market condition and is recognized on a straight-line basis over the estimated service period of approximately three years. If the required service period is not met for these options, then the share-based compensation expense would be reversed. In the event that our common stock achieves the target price per share based on a 30-day trailing average prior to the end of the estimated service period, any remaining unamortized compensation cost will be recognized.

Stock options with market-based vesting criteria granted for fiscal years 2019, 2018 and 2017 were 585,000, 325,000 and 320,000, respectively, at weighted average grant date fair values of \$7.47, \$15.52 and \$13.18 per share, or total grant date fair value \$2.4 million, \$5.0 million and \$4.3 million, respectively.

These NQs with market-based vesting criteria were valued using a Monte Carlo simulation model. The weighted average Monte Carlo input assumptions used for calculating the fair value of these market-based stock options are as follows:

	Fiscal Years		
	2019	2018	2017
Risk-free interest rate	2.8%	2.3%	1.9%
Expected term (years)	3.9	3.4	7.0
Expected volatility	51.9%	45.8%	32.3%
Target price	\$53.87	\$98.99	\$67.39

During our fiscal first quarter of 2019, we canceled 1,122,500 performance-based stock options with a concurrent grant of 748,328 PRSUs for 13 employees, which was accounted for as a modification. The incremental compensation cost resulting from the modification was \$8.2 million, and was being recognized as share-based compensation expense over the requisite service period of three years for the new PRSU awards. As a result of subsequent actions that resulted in forfeitures, the remaining compensation expense associated with this modification as of September 27, 2019 is \$2.8 million.

Restricted Stock Awards and Units

A summary of restricted stock awards and units activity for fiscal year 2019 is as follows (in thousands):

	Number of Shares	Weighted-Average Grant Date Fair Value	Aggregate Intrinsic Value
Issued and unvested - September 28, 2018	1,872	\$ 34.15	\$ 38,452
Granted	2,977	18.18	
Vested	(673)	34.87	
Forfeited, canceled or expired	(1,563)	24.06	
Issued and unvested - September 27, 2019	2,613	21.81	\$ 56,649

As of September 27, 2019, the aggregate intrinsic value of expected to vest restricted stock units including time-based, performance-based, and market-based units was \$56.3 million for fiscal year 2019. The total fair value of restricted stock awards and units vested was \$11.7 million, \$19.7 million and \$51.2 million for the fiscal years 2019, 2018 and 2017, respectively. RSUs granted generally vest over a period of four years.

In addition to RSUs, we also issue PRSUs with specific performance vesting criteria. These PRSUs have both a service and performance-based vesting condition and awards are divided into three equal tranches and vest based on achieving certain adjusted earnings per share growth metrics. The service condition requires participants to be employed on May 15th of the following year once the performance condition has been met. Depending on the actual performance achieved, a participant may earn between 0% to 300% of the targeted shares for each tranche, which is determined based on a straight-line interpolation applied for the achievement between the specified performance ranges. As of September 27, 2019, the performance condition targets for awards with future service conditions had not been met. We granted 1,005,854 PRSUs during fiscal year 2019 and 745,047 were forfeited. The amount of incremental PRSU awards that could ultimately vest if all performance criteria are achieved would be 1,196,337 shares assuming a maximum of 300% of the targeted shares.

We granted 200,000 market-based RSUs during fiscal year 2019, at a weighted average grant date fair value of \$17.65 per share, and a total fair value of \$3.5 million. Recipients may earn between 0% and 150% of the target number of shares based on the Company's achievement of total shareholder return in comparison to a peer group of companies in the Nasdaq composite index over a period of approximately three years. The fair value of the awards was estimated using a Monte Carlo simulation and compensation expense is recognized ratably over the service period based on the grant date fair value of the awards of \$3.5 million subject to the market condition. The expected volatility of the Company's common stock was estimated based on the historical average volatility rate over the three-year period. The dividend yield assumption was based on historical and anticipated dividend payouts. The risk-free rate assumption was based on observed interest rates consistent with the three-year measurement period. The assumptions used to value the awards are as follows:

	Fiscal Year
	2019
Risk free interest rate	1.9%
Years to maturity	3.33
Expected volatility rate	61.5%
Dividend yield	—

21. STOCKHOLDERS' EQUITY

We have authorized 10 million shares of \$0.001 par value preferred stock and 300 million shares of \$0.001 par value common stock as of September 27, 2019 and September 28, 2018. The outstanding shares of common stock as of September 28, 2018, presented in the accompanying Consolidated Statements of Stockholders' Equity, excludes 6,100 unvested shares of restricted stock awards, respectively, issued as compensation to employees that were subject to forfeiture. There were no unvested shares of restricted stock awards that were subject to forfeiture as of September 27, 2019.

Common Stock Warrants—In March 2012, we issued warrants to purchase 1,281,358 shares of common stock for \$14.05 per share. The warrants expire December 21, 2020, or earlier as per the terms of the agreement, including immediately following consummation of a sale of all or substantially all assets or capital stock or other equity securities, including by merger, consolidation, recapitalization or similar transactions. We do not currently have sufficient registered and available shares to immediately satisfy a request for registration, if such a request were made. As of September 27, 2019, no exercise of the warrants had occurred and no request had been made to register the warrants or any underlying securities for resale by the holders.

We are recording the estimated fair values of the warrants as a long-term liability in the accompanying consolidated balance sheets with changes in the estimated fair value being recorded in the accompanying statements of operations.

22. RELATED-PARTY TRANSACTIONS

Cadence Design Systems, Inc. ("Cadence") provides us with certain engineering licenses on an ongoing basis. Geoffrey Ribar, who joined our board of directors on March 22, 2017, served as an officer of Cadence through September 30, 2017 and served as a Senior Advisor to Cadence until March 31, 2018. During fiscal year 2018, we made payments of \$4.1 million to Cadence prior to March 31, 2018. During fiscal year 2017, we made payments of \$6.3 million subsequent to Mr. Ribar joining our board of directors.

23. DIVESTED BUSINESS AND DISCONTINUED OPERATIONS

Divested Business

On May 10, 2018, we completed the sale and transfer of certain assets associated with our Japan-based long-range optical subassembly business (the "LR4 business"), pursuant to an Asset Purchase and Intellectual Property License Agreement, dated April 30, 2018 (the "LR4 Agreement"). The LR4 Agreement provided that the buyer would pay us \$5.0 million within 30 days following the closing of the transactions contemplated by the LR4 Agreement, provide us with the opportunity to supply components, and would pay us further amounts to be determined for inventory and fixed assets within 60 days of receipt of required Chinese government approvals. As of September 28, 2018, \$7.4 million had been recorded as Prepaid and other current assets and \$4.8 million had been recorded as Assets held for sale, as the assets had not been transferred to the buyer as of September 28, 2018.

As a result of the transaction, during fiscal year 2018 we recorded a loss on disposal of \$34.3 million associated with LR4 business as other expense, comprised of expected proceeds of \$17.2 million, subject to receipt of required Chinese government approvals, less the carrying value of assets sold, primarily including customer relationship intangible assets of \$27.7 million, inventory of \$13.7 million, fixed assets of \$7.6 million and goodwill of \$2.6 million. The transaction did not meet the criteria of discontinued operations. We also entered into a Transition Services Agreement (the "LR4 TSA") with the buyer, pursuant to which we agreed to incur up to \$2.0 million of operating expenses for certain ongoing administrative services to support the buyer for up to six months after the closing of the transaction. During fiscal year 2019, we incurred no expenses associated with the LR4 TSA. During fiscal year 2018, we incurred \$2.0 million of expenses associated with the LR4 TSA which were recorded as general and administrative expenses.

As of September 27, 2019, we have \$14.0 million of receivables, net of a \$0.3 million reserve, associated with the LR4 Agreement recorded as Prepaid and other current assets, which includes \$11.9 million of additional consideration, net of tax, and \$1.5 million associated with the LR4 TSA.

Discontinued Operations

On October 27, 2017, we entered into a purchase agreement to sell the Compute business. In consideration for the transfer and sale of the Compute business, we received an equity interest in the buyer valued at approximately \$36.5 million, representing the carrying value of the assets divested and representing less than 20.0% of the buyer's total outstanding equity. The operations of the Compute business were accounted for as discontinued operations through the date of divestiture.

We also entered into a transition services agreement (the "Compute TSA"), pursuant to which we agreed to perform certain primarily general and administrative functions on the buyer's behalf during a migration period and for which we are reimbursed for costs incurred. During the fiscal year 2019, we received \$0.1 million of reimbursements under the Compute TSA, which was recorded as a reduction of our general and administrative expenses. During the fiscal year 2018, we received \$3.6 million of reimbursements under the Compute TSA, which was recorded as a reduction of our general and administrative expenses.

In August of fiscal year 2015, we sold our Automotive business, as the Automotive business was not consistent with our long-term strategic vision from both a growth and profitability perspective. Additionally, we entered into a Consulting Agreement with the buyer pursuant to which we were to provide the buyer with certain non-design advisory services for a period of two years following the closing of the transaction for up to \$15.0 million, from which we have recorded \$7.5 million as other income during both fiscal years 2017 and 2016. No income was recognized during fiscal years 2019 or 2018. During fiscal year 2017, we received \$18.0 million, the full amount of the indemnification escrow.

The accompanying Consolidated Statements of Operations includes the following operating results related to these discontinued operations (in thousands):

	Fiscal Years	
	2018	2017
Revenue (1)	\$ —	\$ 660
Cost of revenue (1)	(596)	2,252
Gross profit (loss)	596	(1,592)
Operating expenses:		
Research and development (1)	5,251	29,167
Selling, general and administrative (1)	1,560	13,840
Total operating expenses	6,811	43,007
Loss from discontinued operations (1)	(6,215)	(44,599)
Other income (2)	—	7,500
Gain on sale (2)	—	18,022
Loss income before income taxes	(6,215)	(19,077)
Income tax provision (benefit)	—	—
Loss income from discontinued operations	(6,215)	(19,077)
Cash flow used in Operating Activities (1)	(10,734)	(42,776)
Cash flow from Investing Activities (2)	—	25,522

(1) Amounts are associated with the Compute business.

(2) Amounts are associated with the Automotive business.

24. EARNINGS PER SHARE

The following table set forth the computation for basic and diluted net income (loss) per share of common stock (in thousands, except per share data):

	Fiscal Years		
	2019	2018	2017
Numerator:			
Loss from continuing operations	\$ (383,798)	\$ (133,762)	\$ (150,416)
Loss from discontinued operations	—	(6,215)	(19,077)
Net loss	(383,798)	(139,977)	(169,493)
Warrant liability gain	—	(27,646)	—
Net loss attributable to common stockholders	<u>\$ (383,798)</u>	<u>\$ (167,623)</u>	<u>\$ (169,493)</u>
Denominator:			
Weighted average common shares outstanding-basic	65,686	64,741	60,704
Dilutive effect of warrants	—	570	—
Weighted average common shares outstanding-diluted	<u>65,686</u>	<u>65,311</u>	<u>60,704</u>
Common stock earnings per share-basic:			
Continuing operations	\$ (5.84)	\$ (2.07)	\$ (2.48)
Discontinued operations	—	(0.10)	(0.31)
Net common stock earnings per share-basic	<u>\$ (5.84)</u>	<u>\$ (2.16)</u>	<u>\$ (2.79)</u>
Common stock earnings per share-diluted:			
Continuing operations	\$ (5.84)	\$ (2.47)	\$ (2.48)
Discontinued operations	—	(0.10)	(0.31)
Net common stock earnings per share-diluted	<u>\$ (5.84)</u>	<u>\$ (2.57)</u>	<u>\$ (2.79)</u>

As of September 27, 2019, we had warrants outstanding which were reported as a liability on the consolidated balance sheet. During fiscal years 2019 and 2018, we recorded gains of \$0.8 million and \$27.6 million, respectively, associated with adjusting the fair value of the warrants, in the Consolidated Statements of Operations primarily as a result of declines in our stock price. When calculating earnings per share we are required to adjust for the dilutive effect of outstanding common stock equivalents, including adjustment to the numerator for the dilutive effect of contracts that must be settled in common stock. During the fiscal year ended September 27, 2019, we excluded the effects of the warrant gain and the 214,303 of potential shares of common stock issuable upon exercise of warrants as the inclusion would be anti-dilutive. During the fiscal year ended September 28, 2018, we adjusted the numerator to exclude the warrant gain \$27.6 million, and we also adjusted the denominator for the dilutive effect of the incremental warrant shares of 569,667 under the treasury stock method. For the fiscal years 2018, the table above excludes the effects of 375,940 shares of potential shares of common stock issuable upon exercise of stock options, restricted stock and restricted stock units as the inclusion would be anti-dilutive. The table excludes the effects of 386,552 and 1,877,401 shares for fiscal years 2019 and 2017, respectively, of potential shares of common stock issuable upon exercise of stock options, restricted stock, restricted stock units and warrants as the inclusion would be anti-dilutive.

25. SUPPLEMENTAL CASH FLOW INFORMATION

As of September 27, 2019 and September 28, 2018, we had \$0.6 million and \$4.0 million, respectively, in unpaid amounts related to purchases of property and equipment included in accounts payable and accrued liabilities. These amounts have been excluded from the payments for purchases of property and equipment in the accompanying Consolidated Statements of Cash Flows until paid.

In January 2017, we issued common stock with a fair value of \$465.1 million in connection with the AppliedMicro Acquisition. This was accounted for as a non-cash transaction as no shares were purchased or sold as part of the transaction.

During fiscal years 2019 and 2018, we capitalized \$1.5 million and \$18.4 million, respectively, of net construction costs relating to the 144 Chelmsford Street facility, of which \$0.3 million and \$12.7 million, respectively, were accounted for as a non-cash transaction as the costs were paid by the developer.

During fiscal year 2018, we divested the Compute business with net assets valued at approximately \$36.5 million in exchange for a \$36.5 million equity interest in Compute. During fiscal years 2019 and 2018, we recorded \$7.5 million and \$10.4 million, respectively, of losses associated with this investment based on our proportionate share of the losses of Compute.

The following is supplemental cash flow information regarding non-cash investing and financing activities (in thousands):

	Fiscal Years		
	2019	2018	2017
Cash paid for interest	\$ 34,157	\$ 29,698	\$ 30,529
Cash (refunded) paid for income taxes	\$ (1,931)	\$ 3,559	\$ (3,161)

26. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS)

The components of accumulated other comprehensive income (loss), net of income taxes, are as follows:

	Foreign Currency Items	Other Items	Total
	Balance - September 29, 2017	\$ 3,139	\$ (162)
Foreign currency translation loss, net of tax	(502)	—	(502)
Unrealized loss on short-term investments, net of tax	—	(287)	(287)
Balance - September 28, 2018	2,637	(449)	2,188
Foreign currency translation gain, net of tax	1,693	—	1,693
Unrealized gain on short-term investments, net of tax	—	477	477
Balance at September 27, 2019	<u>\$ 4,330</u>	<u>\$ 28</u>	<u>\$ 4,358</u>

27. GEOGRAPHIC AND SIGNIFICANT CUSTOMER INFORMATION

We have one reportable operating segment that designs, develops, manufactures and markets semiconductors and modules. The determination of reportable operating segments is based on the chief operating decision maker's ("CODM") definition of the business and the nature and use of financial information provided for the purposes of assessing performance and making operating decisions. The Company's CODM is its President and Chief Executive Officer. The results of operations provided to and analyzed by the CODM are at the consolidated level and accordingly, key resources and assessments of performance are performed at the consolidated level. The Company assesses its determination of operating segments at least annually. We continue to evaluate our internal reporting structure and the potential impact of any changes on our segment reporting.

For information regarding revenue by geographic regions, based upon customer locations, see *Note 3 - Revenue*. Information regarding long-lived assets in different geographic regions is presented below (in thousands):

<u>Long-Lived Assets by Geographic Region</u>	As of	
	September 27, 2019	September 28, 2018
United States	\$ 116,037	\$ 122,888
Asia Pacific (1)	8,917	24,702
Other Countries (2)	7,693	2,333
Total	<u>\$ 132,647</u>	<u>\$ 149,923</u>

(1) Asia Pacific represents Taiwan, Japan, India, Thailand, South Korea, Malaysia, the Philippines, Vietnam and China.

(2) No international country or region represented greater than 10% of the total net long-lived assets as of the dates presented, other than the Asia-Pacific region as presented above.

The following is a summary of customer concentrations as a percentage of total sales and accounts receivable as of and for the periods presented:

<u>Revenue</u>	Fiscal Years		
	2019	2018	2017
Customer A	16%	13%	11%
Customer B	7%	6%	10%

<u>Accounts Receivable</u>	September 27, 2019	September 28, 2018
	Customer A	24%
Customer C	10%	26%

No other customer represented more than 10% of revenue or accounts receivable in the periods presented in the accompanying consolidated financial statements. In fiscal years 2019, 2018 and 2017, our top ten customers represented an aggregate of 54%, 57% and 52% of total revenue, respectively.

28. QUARTERLY FINANCIAL DATA (UNAUDITED)

(In thousands, except per share data)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Fiscal Year
Fiscal Year 2019					
Revenue	\$ 150,689	\$ 128,465	\$ 108,306	\$ 112,248	\$ 499,708
Gross profit	76,625	57,330	33,828	52,925	220,708
(Loss) income from continuing operations	(23,396)	(46,204)	(324,714)	10,516	(383,798)
Per share data (2)					
(Loss) income from continuing operations, basic	\$ (0.36)	\$ (0.71)	\$ (4.93)	\$ 0.16	\$ (5.84)
Per share data (2) (3)					
(Loss) income from continuing operations, diluted	\$ (0.44)	\$ (0.71)	\$ (4.95)	\$ 0.16	\$ (5.84)
Fiscal Year 2018					
Revenue	\$ 130,925	\$ 150,414	\$ 137,872	\$ 151,187	\$ 570,398
Gross profit	60,954	65,601	48,169	70,982	245,706
Loss from continuing operations	(16,970)	(15,466)	(85,210)	(16,116)	(133,762)
Loss from discontinued operations (1)	(5,599)	(18)	(220)	(378)	(6,215)
Per share data (2)					
Loss from continuing operations, basic	\$ (0.26)	\$ (0.24)	\$ (1.31)	\$ (0.25)	\$ (2.07)
Loss from discontinued operations, basic	\$ (0.09)	\$ 0.00	\$ 0.00	\$ (0.01)	\$ (0.10)
Per share data (2) (3)					
Loss from continuing operations, diluted	\$ (0.49)	\$ (0.50)	\$ (1.31)	\$ (0.29)	\$ (2.47)
Loss from discontinued operations, diluted	\$ (0.09)	\$ 0.00	\$ 0.00	\$ (0.01)	\$ (0.10)

- (1) During fiscal year 2017, we announced a plan to divest the Compute business of AppliedMicro, and have included the results of the Compute business as discontinued operations in each subsequent quarter.
- (2) Earnings per share calculations for each of the quarters are based on the weighted average number of shares outstanding and included common stock equivalents in each period. Therefore, the sums of the quarters do not necessarily equal the full year earnings per share.
- (3) Diluted loss per share for the fiscal first and third quarters of 2019 and the fiscal first, second and fourth quarters of 2018 excluded \$5.5 million, \$1.9 million, \$14.6 million, \$17.0 million and \$2.8 million, respectively, related to warrant liability gain.

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 maintain disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), that are intended to ensure that information that would be required to be disclosed in Exchange Act reports is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including the principal executive officer and the principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

An evaluation was performed, under the supervision, and with the participation of our management, including our principal executive officer and principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures as of September 27, 2019. Based on this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of September 27, 2019.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rule 13a-15(f) or 15d-15(f) promulgated under the Securities Exchange Act of 1934 as a process designed by, or under the supervision of, the company's principal executive and principal financial officers 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 and includes those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company;
- 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
- 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 its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management assessed the effectiveness of our internal control over financial reporting as of September 27, 2019. In making this assessment, the company's management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in Internal Control-Integrated 2013 Framework.

Based on this assessment, our management concluded that, as of September 27, 2019, our internal control over financial reporting is effective based on those criteria.

The effectiveness of our internal control over financial reporting as of September 27, 2019 has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Changes in Internal Control over Financial Reporting

There have been no changes in the Company's internal control over financial reporting that occurred during the Company's fiscal quarter ended September 27, 2019 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

To the stockholders and the Board of Directors of MACOM Technology Solutions Holdings, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of MACOM Technology Solutions Holdings, Inc. and subsidiaries (the “Company”) as of September 27, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of September 27, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended September 27, 2019, of the Company and our report dated November 25, 2019, expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company’s management is responsible 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 Annual Report on Internal Control Over Financial Reporting” appearing in Item 9A. Our responsibility is to express an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company’s 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. 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 its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP

Boston, Massachusetts

November 25, 2019

ITEM 9B. OTHER INFORMATION.

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE.

The information required by this item is incorporated herein by reference to our definitive proxy statement for the 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after September 27, 2019.

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, and persons performing similar functions. We make available our code of business conduct and ethics free of charge through our website, which is located at www.macom.com. We intend to disclose any amendments to, or waivers from, our code of business conduct and ethics that are required to be publicly disclosed pursuant to rules of the SEC and the Nasdaq Global Select Market by posting any such amendment or waivers on our website.

ITEM 11. EXECUTIVE COMPENSATION.

The information required by this item is incorporated herein by reference to our definitive proxy statement for the 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after September 27, 2019.

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

Certain information required by this item is incorporated herein by reference to our definitive proxy statement for the 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after September 27, 2019.

Equity Compensation Plan Information

We have two equity compensation plans under which shares are currently authorized for issuance, our 2012 Omnibus Incentive Plan (2012 Plan) and our 2012 Employee Stock Purchase Plan (2012 ESPP). We also maintain our Amended and Restated 2009 Omnibus Stock Plan (2009 Plan), however, no additional awards may be issued under the 2009 Plan. Each of our aforementioned plans were approved by our stockholders prior to our initial public offering in March 2012. The following table provides information regarding securities authorized for issuance as of September 27, 2019 under our equity compensation plans.

Plan Category	(a) Number of securities to be issued upon exercise of outstanding options, warrants and rights(1)	(b) Weighted-average exercise price of outstanding options, warrants and rights(1)	(c) Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))(2)(3)
Equity Compensation Plans Approved by Security Holders	1,657,514	\$ 13.09	19,095,586
Equity Compensation Plans Not Approved by Security Holders	—	—	—
Total	1,657,514	\$ 13.09	19,095,586

(1) Does not include 2,612,950 unvested shares outstanding as of September 27, 2019 in the form of restricted stock awards or restricted stock units under our 2012 Plan, which do not require the payment of any consideration by the recipients.

(2) The 2012 Plan contains an “evergreen” provision, pursuant to which the number of shares of our common stock available for issuance under the 2012 Plan can be increased on the first day of each fiscal year by the lesser of (a) 4.0% of our outstanding common stock on a fully diluted basis as of the end of our immediately preceding fiscal year, (b) 1.9 million shares of our common stock and (c) a lesser amount determined by our board of directors; provided, however, that any shares from any increases in previous years that are not actually issued will continue to be available for issuance under the 2012 Plan.

(3) The 2012 ESPP contains an “evergreen” provision, pursuant to which the number of shares of our common stock available for issuance under the 2012 ESPP can be increased on the first day of each fiscal year by the lesser of (a) 1.25% of our outstanding common stock on a fully diluted basis as of the end of our immediately preceding fiscal year, (b) 550,000 shares of our common stock and (c) a lesser amount determined by our board of directors; provided, however, that any shares from any increases in previous years that are not actually issued will continue to be available for issuance under the 2012 ESPP.

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

The information required by this item is incorporated herein by reference to our definitive proxy statement for the 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after September 27, 2019.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES.

The information required by this item is incorporated herein by reference to our definitive proxy statement for the 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after September 27, 2019.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES.

- (a) Financial Statements (included in "Item 8. - *Financial Statements and Supplementary Data*" of this Annual Report):

Report of Independent Registered Public Accounting Firm
Consolidated Balance Sheets as of September 27, 2019 and September 28, 2018
Consolidated Statements of Operations for the Fiscal Years Ended September 27, 2019, September 28, 2018 and September 29, 2017
Consolidated Statements of Stockholders' Equity and Comprehensive (Loss) Income for the Fiscal Years Ended September 27, 2019, September 28, 2018 and September 29, 2017
Consolidated Statements of Cash Flows for the Fiscal Years September 27, 2019, September 28, 2018 and September 29, 2017
Notes to Consolidated Financial Statements

- (b) Exhibits

The exhibits required by Item 601 of Regulation S-K are filed herewith and incorporated by reference herein.

<u>Exhibit Number</u>	<u>Description</u>
2.1	<u>Purchase Agreement by and among MACOM Connectivity Solutions, LLC, Project Denver Holdings LLC, and MACOM Technology Solutions Holdings, Inc., dated October 27, 2017 (incorporated by reference to Exhibit 2.1 to our Current Report on Form 8-K filed on October 27, 2017).</u>
2.2	<u>Asset Purchase and Intellectual Property License Agreement, dated as of April 30, 2018, by and among CIG Shanghai Co., Ltd., MACOM Japan Limited and MACOM Technology Solutions Holdings, Inc (solely with respect to Sections 2.5 and 12.16 thereof) (incorporated by reference to Exhibit 2.1 to our Current Report on Form 8-K filed on May 15, 2018).</u>
2.3	<u>Amendment to Asset Purchase and Intellectual Property License Agreement, dated as of May 10, 2018, by and among MACOM Japan Limited and CIG Shanghai Co., Ltd. (incorporated by reference to Exhibit 2.2 to our Current Report on Form 8-K filed on May 15, 2018).</u>
3.1	<u>Fifth Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to our Current Report on Form 8-K filed on June 2, 2016).</u>
3.2	<u>Third Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to our Current Report on Form 8-K filed on June 2, 2016).</u>
4.1	<u>Specimen of Common Stock Certificate (incorporated by reference to Exhibit 4.1 to Amendment No. 4 to our Registration Statement on Form S-1 (File No. 333-175934) filed on November 23, 2011).</u>
4.2	<u>Form of Common Stock Purchase Warrant issued on December 21, 2010 (incorporated by reference to Exhibit 4.3 our Registration Statement on Form S-1 (File No. 333-175934) filed on August 1, 2011).</u>
4.3	<u>Second Amended and Restated Investor Rights Agreement, dated February 28, 2012 (incorporated by reference to Exhibit 4.2 to Amendment No. 6 to our Registration Statement on Form S-1 (File No. 333-175934) filed on February 28, 2012).</u>
4.4	<u>First Amendment to the Second Amended and Restated Investor Rights Agreement, dated May 20, 2013 (incorporated by reference to Exhibit 4.5 to our Registration Statement on Form S-3 (File No. 333-188728) filed on May 21, 2013).</u>
4.5	<u>Second Amendment to the Second Amended and Restated Investor Rights Agreement, dated February 2, 2015 (incorporated by reference to Exhibit 4.5 to our Registration Statement on Form S-3 ASR (File No. 333-201827) filed on February 2, 2015).</u>
4.6	<u>Third Amendment to the Second Amended and Restated Investor Rights Agreement, dated June 6, 2018 (incorporated by reference to Exhibit 4.6 to our Registration Statement on Form S-3 ASR (File No. 333-225509) filed on June 8, 2018).</u>
10.1*	<u>Form of Indemnification Agreement between MACOM Technology Solutions Holdings, Inc. and each of its directors and executive officers (incorporated by reference to Exhibit 10.1 to Amendment No. 3 to our Registration Statement on Form S-1 (File No. 333-175934) filed on October 21, 2011).</u>
10.2*	<u>MACOM Technology Solutions Holdings, Inc. Amended and Restated 2009 Omnibus Stock Plan, as amended (incorporated by reference to Exhibit 10.2 to our Annual Report on Form 10-K filed on November 28, 2012).</u>

- 10.3* [Form of Incentive Stock Option Agreement under the MACOM Technology Solutions Holdings, Inc. 2009 Omnibus Stock Plan \(incorporated by reference to Exhibit 10.3 to our Registration Statement on Form S-1 \(File No. 333-175934\) filed on August 1, 2011\).](#)
- 10.4* [Form of Restricted Stock Agreement under the MACOM Technology Solutions Holdings, Inc. 2009 Omnibus Stock Plan \(incorporated by reference to Exhibit 10.4 to our Registration Statement on Form S-1 \(File No. 333-175934\) filed on August 1, 2011\).](#)
- 10.5* [MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan, as amended \(incorporated by reference to Exhibit 10.5 to our Annual Report on Form 10-K filed on November 28, 2012\).](#)
- 10.6* [Form of Restricted Stock Unit Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan \(Time-Based and Performance-Based\) \(incorporated by reference to Exhibit 10.6 to our Annual Report on Form 10-K filed on November 16, 2018\).](#)
- 10.7* [Form of Nonqualified Stock Option Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan \(Performance-Based\) \(incorporated by reference to Exhibit 10.7 to our Annual Report on Form 10-K filed on November 16, 2018\).](#)
- 10.8* [M/A-COM Technology Solutions Holdings, Inc. 2012 Employee Stock Purchase Plan, as amended. \(incorporated by reference to Exhibit 10.4 to our Quarterly Report on Form 10-Q filed on February 2, 2015\).](#)
- 10.9* [Offer of Employment to John Croteau, dated September 6, 2012 \(incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on September 7, 2012\).](#)
- 10.10* [Separation Agreement, by and between John Croteau and MACOM Technology Solutions Inc., dated July 11, 2019 \(incorporated by reference to Exhibit 10.4 to our Quarterly Report on Form 10-Q filed on August 6, 2019\).](#)
- 10.11* [Offer of Employment to Robert McMullan, dated December 11, 2013 \(incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on December 16, 2013\).](#)
- 10.12* [General Release Agreement of Robert J. McMullan, dated July 1, 2019 \(incorporated by reference to Exhibit 10.3 to our Quarterly Report on Form 10-Q filed on August 6, 2019\).](#)
- 10.13* [Offer of Promotion and Revised Terms of Employment Letter, dated September 24, 2013, between MACOM Technology Solutions Inc. and Robert Dennehy \(incorporated by reference to Exhibit 10.1 to our Quarterly Report on Form 10-Q filed on February 2, 2015\).](#)
- 10.14* [Offer of Employment Letter, dated as of December 11, 2013, between MACOM Technology Solutions Inc. and Preetinder Virk \(incorporated by reference to Exhibit \(d\)\(8\) to Amendment No. 4 to our Tender Offer Statement on Schedule TO filed with the SEC on December 11, 2013\).](#)
- 10.15* [Form of Nonqualified Stock Option Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan \(incorporated by reference to Exhibit 10.14 to our Annual Report on Form 10-K filed on November 16, 2018\).](#)
- 10.16* [Form of Incentive Stock Option Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan \(incorporated by reference to Exhibit 10.15 to our Annual Report on Form 10-K filed on November 16, 2018\).](#)
- 10.17* [Form of Restricted Stock Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan \(incorporated by reference to Exhibit 10.16 to our Annual Report on Form 10-K filed on November 16, 2018\).](#)
- 10.18 [Credit Agreement by and among MACOM Technology Solutions Holdings, Inc., Goldman Sachs Bank USA, as Administrative Agent, Collateral Agent, Swing Line Lender and an L/C Issuer, and the other agents and lenders party thereto, dated May 8, 2014 \(incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on May 12, 2014\).](#)
- 10.19 [Incremental Amendment, dated February 13, 2015, among Morgan Stanley Senior Funding, Inc., MACOM Technology Solutions Holdings, Inc., and Goldman Sachs Bank USA \(incorporated by reference to Exhibit 10.1 to our Quarterly Report on Form 10-Q filed on May 13, 2015\).](#)
- 10.20 [Incremental Term Loan Amendment, dated August 31, 2016, by and among MACOM Technology Solutions Holdings, Inc., Goldman Sachs Bank USA, as the administrative agent, and the lender party thereto \(incorporated by reference to our Current Report on Form 8-K filed August 31, 2016\).](#)
- 10.21 [Lease Agreement for 100 Chelmsford Street by and between MACOM Technology Solutions Holdings, Inc., CPI 100 Chelmsford, LLC and CPI 144 Chelmsford, LLC, dated December 28, 2016 \(incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on January 5, 2017\).](#)
- 10.22 [Lease Agreement for 144 Chelmsford Street by and between MACOM Technology Solutions Holdings, Inc., CPI 100 Chelmsford, LLC and CPI 144 Chelmsford, LLC, dated December 28, 2016 \(incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on January 5, 2017\).](#)
- 10.23 [MACOM Technology Solutions Holdings, Inc. Amended and Restated Change in Control Plan and Form of Participation Notice, amended and restated on February 11, 2017 \(incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on February 16, 2017\).](#)
- 10.24 [Second Incremental Amendment, dated as of March 10, 2017, by and among MACOM Technology Solutions Holdings, Inc., Barclays Bank PLC and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on March 13, 2017\).](#)

- 10.25 [Amendment No. 4 to Credit Agreement, dated as of March 10, 2017, by and among MACOM Technology Solutions Holdings, Inc., the revolving credit lenders and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on March 13, 2017\).](#)
- 10.26 [Refinancing Amendment, dated as of March 10, 2017, by and among MACOM Technology Solutions Holdings, Inc., the lenders party thereto and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed on March 13, 2017\).](#)
- 10.27 [Second Refinancing Amendment, dated as of May 19, 2017, by and among MACOM Technology Solutions Holdings, Inc., Morgan Stanley Senior Funding, Inc. and the other term lenders party thereto and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed on May 19, 2017\).](#)
- 10.28 [Second Incremental Term Loan Amendment, dated as of May 19, 2017, by and among MACOM Technology Solutions Holdings, Inc., Morgan Stanley Senior Funding, Inc., as the initial lender, and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed on May 19, 2017\).](#)
- 10.29 [Amendment No. 8 to Credit Agreement, dated as of May 2, 2018, by and among MACOM Technology Solutions Holdings, Inc., certain revolving credit lenders and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.1 to our Quarterly Report on Form 10-Q filed on August 1, 2018\).](#)
- 10.30 [Amendment No. 9 to Credit Agreement, dated as of May 9, 2018, by and among MACOM Technology Solutions Holdings, Inc., certain revolving credit lenders and Goldman Sachs Bank USA, as Administrative Agent \(incorporated by reference to Exhibit 10.2 to our Quarterly Report on Form 10-Q filed on August 1, 2018\).](#)
- 10.31* [Offer of Employment to Stephen G. Daly, dated May 15, 2019 \(incorporated by reference to Exhibit 10.1 to our Quarterly Report on Form 10-Q filed on August 6, 2019\).](#)
- 10.32* [Offer of Promotion to John F. Kober, dated May 23, 2019 \(incorporated by reference to Exhibit 10.2 to our Quarterly Report on Form 10-Q filed on August 6, 2019\).](#)
- 10.33* [Consulting Agreement, by and between Vivek Rajgarhia and MACOM Technology Solutions Inc., dated September 13, 2019.](#)
- 10.34* [General Release Agreement of Vivek Rajgarhia, dated August 21, 2019.](#)
- 10.35* [Separation Agreement, by and between Preetinder S. Virk and MACOM Technology Solutions Inc., dated August 5, 2019.](#)
- 10.36* [General Release Agreement of Preetinder S. Virk, dated November 11, 2019](#)
- 10.37* [Form of Restricted Stock Unit Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan \(Time-Based and Performance-Based\).](#)
- 21.1 [Subsidiaries of Registrant.](#)
- 23.1 [Consent of Deloitte & Touche LLP.](#)
- 31.1 [Certification of Principal Executive Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended.](#)
- 31.2 [Certification of Principal Financial Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended.](#)
- 32.1 [Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14\(b\) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350.](#)
- 101 The following material from the Annual Report on Form 10-K of MACOM Technology Solutions Holdings, Inc. for the fiscal year ended September 27, 2019, formatted in Inline XBRL: (i) Consolidated Balance Sheets, (ii) Consolidated Statements of Operations, (iii) Consolidated Statements of Comprehensive Loss, (iv) Consolidated Statements of Stockholders' Equity, (v) Consolidated Statements of Cash Flows, (vi) Notes to Consolidated Financial Statements and (vii) document and entity information, tagged as blocks of text and including detailed tags.
- 104 The cover page for the Annual Report on Form 10-K of MACOM Technology Solutions Holdings, Inc. for the fiscal year ended September 27, 2019, formatted in Inline XBRL and included as Exhibit 101

* Management contract or compensatory plan.

ITEM 16. FORM 10-K SUMMARY.

None.

SIGNATURES

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

Date: November 25, 2019

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.

Registrant

By: /s/ Stephen G. Daly

Stephen G. Daly

President and Chief Executive 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 indicated on November 25, 2019.

Signature and Title

/s/ Stephen G. Daly

Stephen G. Daly

President and Chief Executive Officer

Director

(Principal Executive Officer)

/s/ John Kober

John Kober

Senior Vice President and Chief Financial Officer

(Principal Accounting and Financial Officer)

Signature and Title

/s/ John Ocampo

John Ocampo

Chairman of the Board

/s/ Susan Ocampo

Susan Ocampo

Director

/s/ Peter Chung

Peter Chung

Director

/s/ Gil Van Lunsen

Gil Van Lunsen

Director

/s/ Charles Bland

Charles Bland

Director

/s/ Geoffrey Ribar

Geoffrey Ribar

Director

CONSULTING AGREEMENT

THIS CONSULTING AGREEMENT (this "Agreement") is made this 13th day of September 2019, by and between MACOM Technology Solutions Inc., a Delaware corporation ("MACOM"), and Vivek Rajgarhia, an individual ("Consultant").

- Services.** Subject to the terms and conditions of this Agreement, MACOM hereby engages Consultant as an independent contractor, and not as an employee, to be available to MACOM on an on-call, as-needed basis to answer questions and provide business-level support for MACOM's lightwave business unit and to provide certain monthly deliverables (the "Monthly Deliverables"), as reasonably requested by MACOM (the "Services"), and Consultant hereby accepts such engagement as an independent contractor. Consultant shall not use or engage any other party to perform all or a portion of the Services.
- Term and Compensation.** The term of engagement (the "Term"), compensation and provisions for payment thereof shall be as set forth on **Exhibit A** attached hereto. **Exhibit A** may be amended in writing from time to time, by agreement of Consultant and MACOM.
- Expenses.** Consultant shall be responsible for all expenses incurred while performing the Services. This includes, without limitation, license fees, memberships and dues; automobile and other travel expenses; meals and entertainment; insurance premiums.
- Confidentiality.** Consultant acknowledges that during the engagement it will have access to and become acquainted with various trade secrets, inventions, innovations, processes, information, records and specifications owned or licensed by MACOM and/or used by MACOM in connection with the operation of its business including, without limitation, products, machines, methods, manufacture, compositions, inventions, discoveries, trade secrets, secret processes, price lists, logical flow diagrams, computer program (including, without limitation, object and source code, computer language, and methods, techniques or algorithms of organizing or applying the same), customer lists, business plans, internal memoranda, manuals, business forms, or any other information of the business or affairs of MACOM and information concerning a third party which MACOM is under an obligation to keep confidential (all herein referred to without limitation as "Confidential Information"). Consultant agrees that it will not disclose any Confidential Information, directly or indirectly, or use any of them in any manner, either during the Term or at any time thereafter. Consultant recognizes that receipt of the MACOM's Confidential Information is not a license to use such information, except exclusively in the course of Consultant's engagement with the MACOM. All Confidential Information, whether prepared by Consultant or otherwise coming into its possession, shall remain the exclusive property of MACOM. Consultant shall not retain any copies of the Confidential Information without MACOM's prior written permission. Upon the expiration or earlier termination of this Agreement, or whenever requested by MACOM, Consultant shall immediately deliver to MACOM all Confidential Information in its possession or under its control. Consultant further agrees that it will not disclose its retention as an independent contractor or the terms of this Agreement to any person without the prior written consent of MACOM and shall at all times preserve the confidential nature of its relationship to MACOM and of the services hereunder. The obligations of Consultant under this Section 4 shall not apply to any such Confidential Information which: (a) is in or comes into the public domain without violation of this Agreement; (b) is known by Consultant prior to disclosure; (c) is independently developed by Consultant; (d) is received lawfully without restriction by Consultant from a third party subsequent to this Agreement; or (e) is required to be disclosed by court order or governmental agency, provided that Consultant promptly notifies MACOM of such process and provides reasonable assistance to MACOM regarding any protective order that MACOM may seek.
- "Works-Made-For Hire."** Consultant acknowledges that all works of authorship created by Consultant during and within the scope of Consultant's engagement, are the subject of copyright protection and are "works made for hire" as that term is defined in the U.S. Copyright Act, 17 U.S.C. § 101 (the "Act"), and therefore such works shall be owned by the MACOM. Consultant further agrees that in the event any work of authorship does not qualify as a "work made for hire" within the Act, then Consultant agrees to and hereby assigns all right, title and interest in and to such work to the MACOM. Whenever requested to do so by MACOM, Consultant shall, without charge to MACOM, do all such acts and execute, acknowledge and/or deliver all such instruments of assignment, transfer and conveyance, and any and all such further instruments and documents, in form and substance reasonably satisfactory to MACOM, as MACOM shall deem necessary or advisable to vest in MACOM all the right, title and interest of Consultant in and to such works made for hire.

6. **Conflicts of Interest; No-Hire Provision.** Consultant represents that it is free to enter into this Agreement and that this engagement does not violate the terms of any agreement between Consultant and any third party. Further, Consultant, in rendering its duties shall not utilize any invention, discovery, development, improvement, innovation, or trade secret in which it does not have a proprietary interest. During the Term, Consultant shall devote as much of their productive time, energy and abilities as are reasonably required to perform the Services in a timely and productive manner. For a period of twelve (12) months following any termination, Consultant shall not, directly or indirectly hire, solicit, or encourage to leave MACOM's employment, any employee, consultant or contractor of MACOM or hire any such employee, consultant or contractor who has left MACOM's employment or contractual engagement within one year of such employment or engagement.
7. **Non-Competition.** Consultant agrees that during the Term, Consultant shall not, anywhere in the United States or in any other geographic areas worldwide in which MACOM, conducts, conducted or is actively engaged in pursuing the Business (defined below) during the Term, directly or indirectly, including through any affiliate, compete with MACOM with respect to the Business, or own, manage, operate, control, be employed by, provide services to, or otherwise deal with, engage or participate in, or be connected as an owner, partners, equityholder, financing source, principal, sales representative, employee, or member of the board of directors of, or advisor or consultant to, any person (including, but no limited to, an governmental authority or entity) that competes, directly or indirectly, including through an affiliate, with MACOM (each, a "Competitor"). The term "Business" means the manufacturing, selling, distributing, developing, researching and/or servicing of monolithically integrated optoelectronic components based on indium phosphide and/or other semiconductor materials and/or providing custom integrated microphotonic solutions for optical systems and subsystems. Notwithstanding the foregoing provisions of this Section 7, Consultant may own securities in any Competitor that is a publicly-held corporation, but only to the extent that Consultant does not own, of record or beneficially, more than one percent (1%) of the outstanding beneficial ownership of any such Competitor.
8. **Right to Injunction.** The parties hereto acknowledge that the Services to be rendered by Consultant and its obligations hereunder including, without limitations, its obligation under Sections 4, 5 and 6 and the rights and privileges granted to MACOM under this Agreement are of a special, unique, unusual and extraordinary character which gives them a peculiar value, the loss of which cannot be reasonably or adequately compensated by damages in any action at law, and the breach by Consultant of any of the provisions of this Agreement will cause MACOM irreparable injury and damage. Consultant expressly agrees that MACOM shall be entitled to injunctive and other equitable relief in the event of, or to prevent, a breach of any provision of this Agreement by Consultant. Resort to such equitable relief, however, shall not be construed to be a waiver of any other rights or remedies that MACOM may have for damages or otherwise. The various rights and remedies of MACOM under this Agreement or otherwise shall be construed to be cumulative, and no one of them shall be exclusive of any other or of any right or remedy allowed by law.
9. **Termination.** Either party may terminate this Agreement at any time by providing ten (10) working days' written notice to the other party. In addition, if Consultant is convicted of any crime or offense, fails or refuses to comply with the written policies or reasonable directive of MACOM, is guilty of serious misconduct in connection with performance hereunder, or materially breaches any provision of this Agreement, MACOM may terminate the engagement of Consultant immediately and without prior written notice to Consultant.
10. **Independent Contractor.** This Agreement shall not render Consultant an employee, partner, agent of or joint-venturer with MACOM for any purpose. Consultant is and will remain an independent contractor in its relationship to MACOM and will not become a MACOM employee. MACOM shall not be responsible for withholding taxes with respect to Consultant's compensation hereunder. MACOM shall not and shall have no obligation to: (a) (i) withhold FICA (Social Security and Medicare taxes) from Consultant's payments or make FICA payments on Consultant's behalf, (ii) make state or federal unemployment compensation contributions or payments on Consultant's behalf, or (iii) withhold state or federal income tax from Consultant's payments (collectively referred to as "Taxes"); or (b) obtain workers' compensation insurance or any other insurance coverage of any kind on behalf of Consultant (collectively the "Insurances"). Consultant is not eligible to participate in any employee pension, health, vacation pay, sick pay or other fringe benefit plan of MACOM (collectively "Benefits"). Consultant and MACOM agree that: (a) the parties will mutually agree on the means, manner and method by which the services required by this Agreement will be performed; and (b) Consultant has the right to perform the services required by this Agreement at any location or time. Consultant specifically agrees to comply at all times with MACOM's Insider Trading Policy Statement, a copy of which has been provided to Consultant by MACOM.

11. **Indemnification.** Consultant shall protect, defend, indemnify and hold MACOM harmless from any damages, losses, expenses or liabilities arising or resulting from or in connection with: (a) Consultant's breach of this Agreement; (b) Consultant's acts or omissions outside the scope of the Services; (c) Consultant's negligent acts or omissions in performing the Services and (d) the Taxes, Insurances or Benefits.
12. **Successors and Assigns; No Third Party Beneficiary Rights.** All of the provisions of this Agreement shall be binding upon and inure only to the benefit of the parties hereto and their respective heirs, if any, successors, and assigns. No provision of this Agreement shall in any way inure to the benefit of any third party (including the public at large) so as to constitute any such person a third party beneficiary of this Agreement or any provision hereof, or otherwise give rise to any cause of action in any person not a party hereto.
13. **Choice of Law; Venue; Attorney Fees.** The construction, interpretation, and performance of this Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts without regard to conflicts of laws principles. The parties hereto agree that all actions or proceedings arising in connection with this Agreement shall be tried and litigated exclusively in the State and Federal courts located in the County of Middlesex, Commonwealth of Massachusetts. The aforementioned choice of venue is intended by the parties to be mandatory and not permissive in nature, thereby precluding the possibility of litigation between the parties with respect to or arising out of this Agreement in any jurisdiction other than that specified in this section. Each party hereby waives any right it may have to assert the doctrine of *forum non conveniens* or similar doctrine or to object to venue with respect to any proceeding brought in accordance with this Section 13, and stipulates that the State and Federal courts located in the County of Middlesex, Commonwealth of Massachusetts shall have *in personam* jurisdiction and venue over each of them for the purpose of litigating any dispute, controversy, or proceeding arising out of or related to this Agreement. Each party hereby authorizes and accepts service of process sufficient for personal jurisdiction in any action against it as contemplated by this Section 13 by registered or certified mail, return receipt requested, postage prepaid, to its address for the giving of notices as set forth in this Agreement. Any final judgment rendered against a party in any action or proceeding shall be conclusive as to the subject of such final judgment and may be enforced in other jurisdictions in any manner provided by law. In any litigation or other proceeding by which one party either seeks to enforce its rights under this Agreement (whether in contract, tort, or both) or seeks a declaration of any rights or obligations under this Agreement, the prevailing party shall be awarded its reasonable attorney fees, and costs and expenses incurred.
14. **Section Headings; Incorporation of Annexes; Interpretation; and Gender.** The headings of the sections herein are inserted for convenience only and are not intended to affect the meaning or interpretation of this Agreement. The Annexes hereto are incorporated into this Agreement and shall be deemed a part hereof as if set forth herein in full. References herein to "this Agreement" and the words "herein," "hereof" and words of similar import refer to this Agreement (including its Annexes as an entirety). In the event of any conflict between the provisions of this Agreement and any such Annex the provisions of this Agreement shall control. The pronouns it, its and itself shall refer to as herein he, she, his, her, himself and herself where appropriate.
15. **Waiver.** Waiver by one party hereto of breach of any provision of this Agreement by the other shall not operate or be construed as a continuing waiver.
16. **Assignment.** Consultant shall not assign any of its rights under this Agreement, or delegate the performance of any of its duties hereunder, without the prior written consent of MACOM.
17. **Notices.** All notices, demands, consents, approvals or other communications ("Notices") required or permitted in connection with this Agreement shall be in writing and shall be personally served, mailed by registered or certified air mail, postage prepaid, or by overnight courier service, service fee prepaid to the address of each party above, or to such other addresses as may be designated by each Party in writing from time to time in accordance with this Section 17, with a hard copy to follow via air mail or overnight courier service in accordance with this Section 17. If such Notice is served personally, notice shall be deemed constructively made at the time of such personal service. If such Notice is given by mail, such Notice shall be conclusively deemed given five days after deposit thereof in the United States mail addressed to the party to whom such Notice is to be given.
18. **Modification or Amendment.** No amendment, change or modification of this Agreement shall be valid unless in writing signed by the parties hereto.

CONFIDENTIAL

GENERAL RELEASE AGREEMENT

In consideration for the severance payments and benefits to be provided to me by MACOM Technology Solutions Inc. ("MACOM") as set forth in the attached letter dated July 1, 2019, to which I am not otherwise entitled, I, on behalf of myself and my heirs, spouse, executors, administrators, beneficiaries, personal representatives, agents and assigns, hereby completely release and forever discharge MACOM, its predecessors (including but not limited to Optomai, Inc.), successors, affiliates, subsidiaries and/or related entities and each of its and their past, present, and future officers, directors, stockholders, agents, employees, attorneys, insurers, employee benefit plans, partners, administrators, agents, trustees, representatives, successors and assigns, each individually and in their formal capacities (collectively with MACOM, the "Releasees") from any and all claims of any and every kind, nature, and character, known or unknown, foreseen or unforeseen, arising from, connected with or related to the dealings between me and any of the Releasees prior to the date of this General Release Agreement (this "Release").

Without limiting the generality of the foregoing, I also specifically release the Releasees from any and all claims arising out of my offer of employment, my employment or other association, or the termination of my employment or other association with any of the Releasees, including but not limited to claims for wrongful discharge, claims related to any contracts of employment, express or implied, claims for breach of privacy, defamation or any other tort, claims for attorneys' fees and costs, claims under the laws of the state or states where I have provided services to any of the Releasees relating to wages and hours, compensation, overtime, commissions and breaks, claims relating to leaves of absence and reasonable accommodation, and claims relating to harassment, discrimination, retaliation and/or civil rights.

This Release also includes, but is not limited to, any and all claims arising under any federal, state and/or municipal law, regulation, ordinance or common law, including but not limited to any claims under Title VII of the Civil Rights Act of 1964, the Equal Pay Act, the Family and Medical Leave Act, the Americans With Disabilities Act, the Fair Labor Standards Act, the False Claims Act, the Age Discrimination in Employment Act (the "ADEA"), the Older Workers Benefit Protection Act (the "OWBPA"), the Worker Adjustment and Retraining Notification Act, the California Fair Employment and Housing Act, the Massachusetts Fair Employment Practices Act, the Texas Employment Discrimination Law, the New Jersey Law Against Discrimination, the New Hampshire Law Against Discrimination, the New York Human Rights Act, the Oregon Fair Employment Act, and any other federal, state or local statute, regulation, ordinance or common law. I understand that the only claims that are not covered by this Release are claims expressly exempted by law, such as claims that may arise under the ADEA after the effective date of this Release, unemployment insurance claims or certain workers' compensation claims, or claims exempted by the express terms of a written benefit plan.

I expressly waive and release any rights or benefits that I have or may have under Section 1542 of the California Civil Code, which provides as follows: "A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release and that, if known by him or her, would have materially affected his or her settlement with the debtor or released party." Thus, notwithstanding the provisions of Section 1542, and for the purpose of implementing a full and complete release and discharge of all Releasees, I expressly acknowledge that this Release is intended to include in its effect, without limitation, all claims which I do not know or suspect to exist in my favor against the Releasees, or any of them, at the time of execution of this Release, and that this Release contemplates the extinguishment of any such claims.

I agree that I will not file or cause to be filed any claims, actions, lawsuits, or legal proceedings against any of the Releasees involving any matter occurring up to or on the date of this Release or involving any continuing effects of any acts or practices that may have arisen or occurred before the date of this Release. I further agree that I will not participate in a representative capacity, or join or participate as a member of a class, collective or representative action instituted by someone else against any of the Releasees, and will expressly opt-out of any such proceeding. Notwithstanding the foregoing, nothing in this Release shall prohibit me from contacting, filing of claims with, providing information to or participating in any proceeding before the federal Equal Employment Opportunity Commission, Securities and Exchange Commission or any other government agency; provided, however, that I hereby waive any right to recover monetary damages or other personal relief in connection with any such claims or proceedings, with the exception of an award for information provided pursuant to a whistleblower protection law. This Release also does not preclude a court action, claim or other legal proceeding to challenge the validity of this Release. If I file a claim, action, lawsuit or legal proceeding in violation of this paragraph, other than a claim pursuant to the ADEA or the OWBPA, I shall be obligated to return all consideration received for this Release and will be liable for attorney's fees, costs and expenses incurred by the Releasees or their insurer(s) in defending such claim.

This Release and its attachments constitutes the entire agreement between the Releasees and me on the matters addressed in this Release, provided, however, that I shall remain bound by any agreements related to the arbitration of disputes, confidentiality, return of property, non-competition, non-solicitation, no-hire, ownership of inventions, and/or ownership/assignment of intellectual property rights that I signed with respect to any of the Releasees. I have not been influenced to sign this Release by, nor am I relying on, any agreement, representation, statement, omission, understanding, or course of conduct by MACOM or any other Releasee that is not expressly set forth in this Release.

I understand and agree that this Release should not be deemed or construed at any time, or for any purpose, as an admission of any liability or wrongdoing by any Releasee or by me. I also agree that if any provision of this Release is deemed invalid, the remaining provisions will still be given full force and effect. This Release cannot be orally modified, orally revised, or orally rescinded, and can only be amended in a written instrument signed by both me and an authorized representative of MACOM. The terms and conditions of this Release will be interpreted and construed in accordance with the law of the state in which I work.

Before signing this Release, I have obtained sufficient information to intelligently exercise my own judgment about whether to sign it. I acknowledge that MACOM has advised me to consult an attorney before signing this Release. I acknowledge that MACOM has given me twenty-one (21) days in which to consider this Release, and explained to me that if I decide to sign this Release, it should not be dated, signed and returned until after the date that my employment terminates, and if I sign this Release prior to the end of the twenty one (21) day period, I have done so voluntarily and of my own free will. I understand that once I sign this Release, I shall have seven (7) calendar days from the date of my signature to revoke this Release. Notice of revocation must be in writing, and submitted to MACOM within the seven-day period. This Release shall not become effective or enforceable, and severance benefits otherwise payable in respect of this Release shall not become payable, until such revocation period has expired. I acknowledge that the consideration given for this Release is in addition to anything of value to which I was already entitled absent my signing, delivering and not revoking this Release.

Except as otherwise provided by applicable law, at all times following the signing of this Release, I shall not engage in any disparagement or vilification of any Releasee, my employment experience with any Releasee, or any Releasee's products, services, agents, representatives, directors, officers, stockholders, attorneys, employees, or affiliates, and I represent that I shall refrain from making any false, negative, critical or otherwise disparaging statements, implied or expressed, concerning the management style, methods of doing business, role in the community, treatment of employees or the circumstances and events regarding any

separation, with regard to any Releasee. For purposes of this Paragraph, “disparagement” or “disparaging” shall refer to the making of any statements or insinuations, or undertaking any conduct, that would tend to lessen the standing or stature of an institution or person in the eyes of an ordinary citizen. I acknowledge that I further agree to do nothing that would damage any Releasee’s business reputation or good will, nor will I make any statements to the press regarding the Releasees. For the avoidance of doubt, I further acknowledge that I will not make or post any disparaging comments regarding the Releasees in any sort of internet posting or social media forum, such as Facebook, LinkedIn, Twitter, Glassdoor.com, Monster.com, or any similar internet website or online platform. The provisions of this paragraph, however, shall not apply to communications with the Equal Employment Opportunity Commission (“EEOC”) or a state or local anti-discrimination agency, nor shall such provisions (or any provision of this Release) prohibit me from reporting possible violations of federal law or regulation to any government agency or entity, including but not limited to the Department of Justice, the Securities and Exchange Commission, the Congress and any agency Inspector General, or making other disclosures that are protected under the whistleblower provisions of federal law or regulation. I expressly acknowledge and agree that if I engage in any conduct in violation of this section, I shall be obligated to return the consideration received under this Release and will be liable for attorneys’ fees and costs incurred by MACOM or its insurer(s) in enforcing their rights under this paragraph, as well as any actual damages suffered by MACOM as a result of my conduct. The Release shall otherwise remain in full force and effect.

I represent and warrant that I have returned all MACOM property and Confidential Information (as defined in the MACOM Confidentiality and Invention Assignment Agreement in Connection with Severance attached hereto, which I am signing concurrently with this Release) to MACOM, and that I neither possess nor will use any such MACOM property or Confidential Information after the date of this Release. The provisions of this paragraph, however, shall not apply to communications with the EEOC or a state or local anti-discrimination agency, nor shall such provisions prohibit me from reporting possible violations of federal law or regulation to any government agency or entity, including but not limited to the Department of Justice, the Securities and Exchange Commission, the Congress and any agency Inspector General, or making other disclosures that are protected under the whistleblower provisions of federal law or regulation. I further understand that, pursuant to 18 USC Section 1833(b), I shall not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that is made: (a) in confidence to a federal, state, or local government official, either directly or indirectly, or to an attorney, and solely for the purpose of reporting or investigating a suspected violation of law; or (b) in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. Further, I understand that an individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual: (i) files any document containing the trade secret under seal; and (ii) does not disclose the trade secret, except pursuant to court order.

I have read this Release, and I understand all of its terms. I further acknowledge and agree that I have signed this Release voluntarily, without coercion, and with full knowledge of its significance. I am of sound mind and competent to manage my legal, personal and business affairs and enter into a binding agreement in this regard, and am not currently prevented from doing so by the effects of any intoxicant, drug, medication, health condition or other influence.

I agree that any breach of this Release may result in irreparable injury to the Releasees for which there is no adequate remedy at law and that in the event of such a breach, the Releasees in addition to any other rights or remedies that they may have, shall be entitled to a temporary restraining order and/or preliminary or permanent injunction, restraining me from violations of this Release. I also agree that if I violate this Release, the Releasees will be entitled any damages arising from such breach and shall also be entitled to recover

their costs and expenses, including attorneys' fees, that are incurred in enforcing their rights under this Release. Each Releasee shall have an independent right to enforce the terms of this Release against me, without need of any consent or other action by any other Releasee.

I acknowledge that MACOM may have a legal obligation to report the terms of this Release to the federal government pursuant to Section 111 of the Medicare, Medicaid and SCHIP Extension Act of 2007 (MMSEA). I represent and warrant that no Medicare or Medicaid liens, claims, demands, subrogated interests, or causes of action of any nature or character exist or have been asserted arising from or related to my employment with MACOM or arising from any claim released above. I further agree that I and not the Releasees shall be responsible for satisfying all such liens, claims, demands, subrogated interests, or cause of action that may exist or have been asserted or that may in the future exist or be asserted.

[Remainder of Page Intentionally Left Blank]

EMPLOYEE'S ACCEPTANCE OF RELEASE

I have carefully read, fully understand, and voluntarily agree to all of the terms of this Release in exchange for the severance benefits to which I would not otherwise be entitled.

8/21/19 /s/ Vivek Rajgarhia

Date Signature

Vivek Rajgarhia

Printed Name

Attachments:

Letter Regarding Benefits on Termination

MACOM Confidentiality and Invention Assignment Agreement in Connection with Severance

BY HAND

August 5, 2019

Preet Virk

Dear Preet:

The purpose of this letter agreement (this "Agreement") is to confirm the terms of your transition from employment with MACOM Technology Solutions Inc. (the "Company").

1. Transition Period and Separation Date.

(a) Effective as of August 5, 2019 (the "Transition Date") your role as Senior Vice President and General Manager, Networks, of the Company terminated, provided that you will remain employed by the Company as an advisor to provide certain transition services to the Company through the date that your employment terminates (the "Separation Date"). Provided that you comply in full with your obligations hereunder, it is expected that the Separation Date will be November 3, 2019. The period beginning on the Transition Date and concluding on the Separation Date is hereinafter referred to as the "Transition Period".

(b) During the Transition Period, you will continue to receive your base salary, payable at the rate in effect as of the date hereof, and to participate in all employee benefit plans of the Company accordance with the terms of those plans, except that you will not continue to accrue vacation time. During the Transition Period, you shall continue to abide by Company policies and be available on an on-call basis to support the business's key deliverables as requested by the Company from time to time, including without limitation, transitioning all of your responsibilities, relationships, and files to any authorized Company designees. You will not incur any business expenses during the Transition Period without the advance approval of the Chief Executive Officer of the Company.

(c) Effective as of the Transition Date, you will be deemed to have resigned from any and all positions and offices that you hold (as applicable) with the Company or any of its Affiliates, other than your continued employment as a senior advisor through the Transition Period, without any further action required therefor (collectively, the "Resignations"). The Company, on its own behalf and on behalf of its Affiliates, hereby accepts the Resignations as of the Transition Date. For purposes of this Agreement, "Affiliates" means all persons and entities directly or indirectly controlling, controlled by or under common control with the Company.

2. Final Salary and Vacation Pay. You will receive, on the Separation Date, pay for all work you have performed for the Company through the Separation Date, to the extent not previously paid, as well as pay, at your final base rate of pay, for all vacation days you have earned but not used, determined in accordance with Company policy and as reflected on the books of the Company. You will receive the payments described in this Section 2 regardless of whether or not you elect to sign this Agreement.

3. Severance Benefits. In consideration of your execution of this Agreement, the ECIA (as defined below), and the Supplemental Release (as defined below), as well as your continued compliance with the Continuing Obligations (as defined in Section 6(a) below):

(a) The Company will pay you the severance payments and related benefits to which you are entitled pursuant to Section 7 of the Letter from the Company to you dated December 11, 2013 regarding Offer of Employment with the Company (the "Employment Agreement" and attached hereto as Exhibit A), which include the following:

1. continued salary payments at the rate of \$12,115.38 per bi-weekly pay period (the "Severance Payments"), for a period of six (6) months following your termination date (such period, the "Severance Period"), such that the aggregate amount of Severance Payments potentially payable hereunder is \$157,500, subject to normal withholding; and
2. to the extent that you or any of your dependents may be covered under the terms of any Company medical and dental plans immediately prior to the termination of your employment, and you elect to continue such coverages at your own expense under the provisions set forth by the Consolidated Omnibus Budget Reconciliation Act of 1985 as described below, the Company will provide you with reimbursement for premiums paid for the continuation of such benefits for you and those dependents for the same or equivalent coverages through the end of the Severance Period (the "Health Continuation Payments" and, together with the Severance Payments, the "Severance Benefits"). The Company is under no obligation to provide reimbursement for special coverages for you that would not be covered by the plans applicable to employees generally. The reimbursement payable to you pursuant to this paragraph shall be reduced by the amount equal to the contributions required from time to time from other employees for equivalent coverages under the Company's medical or dental plans. Notwithstanding the foregoing, in the event that the Company's payment of the Health Continuation Payments would subject the Company to any tax or penalty under the Patient Protection and Affordable Care Act (as amended from time to time, the "ACA") or Section 105(h) of the Internal Revenue Code of 1986, as amended ("Section 105(h)"), or applicable regulations or guidance issued under the ACA or Section 105(h), you and the Company agree to work together in good faith, consistent with the requirements for compliance with or exemption from Section 409A of the Internal Revenue Code of 1986, as amended, to restructure such benefit.

(b) The Severance Payments and Health Continuation Payments will be made in accordance with the Company's regular payroll schedule, and will begin on the first regularly scheduled Company payday occurring after the date that the Supplemental Release takes effect (i.e., after your Supplemental Release has been signed and any applicable revocation period has elapsed without your revoking the Supplemental Release); provided, however, that the first such payment shall include any installments of Severance Payments and Health Continuation Payments that you would have received prior to such pay day had your Supplemental Release been effective on the date of your termination of employment.

4. **Acknowledgement of Full Payment and Withholding.** You acknowledge and agree that the payments provided under Section 2 of this Agreement are in complete satisfaction of any and

all compensation or benefits due to you from the Company or any of its Affiliates, whether for services provided to the Company or otherwise, through the Separation Date. You further acknowledge that, except as expressly provided hereunder, no further compensation or benefits are owed or will be provided to you by the Company or any of its Affiliates. All payments made by the Company under this Agreement shall be reduced by any tax or other amounts required to be withheld by the Company under applicable law and all other lawful deductions authorized by you.

5. **Status of Employee Benefits, Paid Time Off, and Expenses.**

(a) Except for any right you may have to continue your participation and that of your eligible dependents in the Company's group health plans under the federal law known as "COBRA" or similar applicable law, and subject to the Health Continuation Payments, your participation in all employee benefit plans of the Company will end as of the Separation Date in accordance with the terms of those plans. You will not continue to earn paid time off after the Transition Date, but will be entitled to continued health coverage benefits consistent with your current plan enrollments through the Separation Date. You will receive information about your COBRA continuation rights under separate cover.

(b) On or before the Separation Date, you must submit your final expense reimbursement statement reflecting all business expenses you incurred through the Separation Date, if any, for which you seek reimbursement, and, in accordance with Company policy, reasonable substantiation and documentation for the same. The Company will reimburse you for any such authorized and documented expenses within thirty (30) days of receiving such statement pursuant to its regular business practice.

6. **Continuing Obligations, Confidentiality and Non-Disparagement.**

(a) You acknowledge that you will be bound by the Employee Confidentiality and Invention Assignment Agreement (the "ECIA"), which is attached hereto as Exhibit B and which must be executed by you as a condition to your receipt of severance, and any other obligations relating to confidentiality, non-competition, non-solicitation, no-hire, invention assignment and/or any other restrictive covenants in any agreement by and between you and the Company or any of its Affiliates, to the extent that such obligations survive termination of your employment by the terms thereof (collectively, the "Continuing Obligations"). The obligation of the Company to provide you with payments or benefits under Section 3 of this Agreement, and your right to retain the same, is expressly conditioned upon your continued full performance of your obligations hereunder and of the Continuing Obligations.

(b) You agree that you will continue to protect Confidential Information, as defined herein, and that you will never, directly or indirectly, use or disclose it, except as required by applicable law. For purposes of this Agreement, "Confidential Information" means any and all information of the Company or any of its Affiliates that is not generally known to the public, together with any and all information received by the Company or any of its Affiliates from any third party with any understanding, express or implied, that the information would not be disclosed.

(c) You agree that you will not disclose, directly or by implication, this Agreement or any of its terms or provisions, except to members of your immediate family and to your legal and tax advisors, and then only on condition that they agree not to further disclose this Agreement or any of its terms or provisions to others.

(d) During the Transition Period and following the Separation Date, you agree (i) to cooperate with the Company and its Affiliates hereafter with respect to all matters arising during or related to your employment, including but not limited to all matters in connection with any governmental investigation, litigation or regulatory or other proceeding which may have arisen or which may arise following the signing of this Agreement and (ii) to be reasonably available to assist with the transition of your duties and business relationships to Company designees as may be requested by the Company from time to time. The Company will reimburse you for any reasonable expenses incurred in rendering such cooperation and approved by the Company in advance.

(e) Except as otherwise required by law, you agree that you will never disparage or criticize the Company, its Affiliates, their business, their management or their products or services, or any of the Released Parties (as defined in Section 8 below) (including without limitation, in any conversations you may have with any current, prospective or former employees, independent contractors, customers, suppliers, vendors, investors, lenders, insurers or other business partners of the Company or any of its Affiliates, or in any public forum or with members of the press), and that you will not otherwise do or say anything that could disrupt the good morale of employees of the Company or any of its Affiliates or harm the interests or reputation of the Company or any of its Affiliates, and you hereby represent that you have not between the date you received this Agreement and its effective date said or done any of the things proscribed by this Section 6(e).

(f) For the avoidance of doubt, (i) nothing contained in this Agreement limits, restricts or in any other way affects your communicating with any governmental agency or entity, or communicating with any official or staff person of a governmental agency or entity, concerning matters relevant to such governmental agency or entity and (ii) you will not be held criminally or civilly liable under any federal or state trade secret law for disclosing a trade secret (y) in confidence to a federal, state, or local government official, either directly or indirectly, or to an attorney, solely for the purpose of reporting or investigating a suspected violation of law, or (z) in a complaint or other document filed under seal in a lawsuit or other proceeding; provided, however, that notwithstanding this immunity from liability, you may be held liable if you unlawfully access trade secrets by unauthorized means.

7. **Return of Company Documents and Other Property.** In signing this Agreement, you agree that you will return to the Company, on or before the Separation Date, any and all documents, materials and information (whether in hardcopy, on electronic media or otherwise) related to the business of the Company and its Affiliates (whether present or otherwise), and all keys, access cards, credit cards, computer hardware and software, telephones and telephone-related equipment and all other property of the Company or any of its Affiliates in your possession or control. Further, you agree that you will not retain any copy or derivation of any documents, materials or information (whether in hardcopy, on electronic media or otherwise) of the Company or any of its Affiliates. Recognizing that your employment with the Company will be terminating on the Separation Date, you agree that you will not, following the Separation Date, for any purpose, attempt to access or use any computer or computer network or system of the Company or any of its Affiliates, including without limitation the electronic mail system. Further, you agree to disclose to the Company, on or before the Separation Date, all passwords necessary or desirable to obtain access to, or that would assist in obtaining access to, all information which you have password-protected on any computer equipment, network or system of the Company or any of its Affiliates.

8. **General Release and Waiver of Claims.**

(a) In exchange for your continued engagement during the Transition Period and the payments and benefits provided to you under Section 3 of this Agreement, to which you would not otherwise be entitled, on your own behalf and that of your heirs, executors, administrators, beneficiaries, personal representatives and assigns, you agree that this Agreement shall be in complete and final settlement of any and all causes of action, rights and claims, whether known or unknown, accrued or unaccrued, contingent or otherwise, that you have had in the past, now have, or might now have, in any way related to, connected with or arising out of your employment, its termination, your other associations with the Company, its predecessors (including but not limited to Mindspeed Technologies, LLC), successors, affiliates, subsidiaries and/or related entities and each of its and their past, present, and future officers, directors, stockholders, agents, employees, attorneys, insurers, employee benefit plans, partners, administrators, agents, trustees, representatives, successors and assigns, each individually and in their formal capacities (collectively with the Company, the “Releasees”) from any and all claims of any and every kind, nature, and character, known or unknown, foreseen or unforeseen, arising from, connected with or related to the dealings between you and any of the Releasees prior to the date of this Agreement. Without limiting the generality of the foregoing, you also specifically release the Releasees from any and all claims arising out of your offer of employment, your employment or other association, or the termination of your employment or other association with any of the Releasees, including but not limited to claims for wrongful discharge, claims related to any contracts of employment, express or implied, claims for breach of privacy, defamation or any other tort, claims for attorneys’ fees and costs, claims under the laws of the state or states where you have provided services to any of the Releasees relating to wages and hours, compensation, overtime, commissions and breaks, claims relating to leaves of absence and reasonable accommodation, and claims relating to harassment, discrimination, retaliation and/or civil rights. This general release of claims also includes, but is not limited to, any and all claims arising under any federal, state and/or municipal law, regulation, ordinance or common law, including but not limited to any claims under Title VII of the Civil Rights Act of 1964, the Equal Pay Act, the Family and Medical Leave Act, the Americans With Disabilities Act, the Fair Labor Standards Act, the False Claims Act, the Age Discrimination in Employment Act (the “ADEA”), the Older Workers Benefit Protection Act (the “OWBPA”), the Worker Adjustment and Retraining Notification Act, the Massachusetts Fair Employment Practices Act, and any other federal, state or local statute, regulation, ordinance or common law. You understand that the only claims that are not covered by this general release of claims are claims expressly exempted by law, such as claims that may arise under the ADEA after the effective date of this Agreement, unemployment insurance claims or certain workers’ compensation claims, or claims exempted by the express terms of a written benefit plan. You agree that you will not file or cause to be filed any claims, actions, lawsuits, or legal proceedings against any of the Releasees involving any matter occurring up to or on the date of this Agreement or involving any continuing effects of any acts or practices that may have arisen or occurred before the date of this Agreement. You further agree that you will not participate in a representative capacity, or join or participate as a member of a class, collective or representative action instituted by someone else against any of the Releasees, and will expressly opt-out of any such proceeding. Notwithstanding the foregoing, nothing in this Agreement shall prohibit you from contacting, filing of claims with, providing information to or participating in any proceeding before the federal Equal Employment Opportunity Commission, Securities and Exchange Commission or any other government agency; provided, however, that you hereby waive any right to recover monetary damages or other personal relief in connection with any such claims or proceedings, with the exception of an award for information provided pursuant to a whistleblower protection law. This Agreement also does not preclude a court action, claim or other legal proceeding to challenge the validity of this release of

claims. If you file a claim, action, lawsuit or legal proceeding in violation of this paragraph, other than a claim pursuant to the ADEA or the OWBPA, you shall be obligated to return all consideration received for this Agreement and will be liable for attorney's fees, costs and expenses incurred by the Releasees or their insurer(s) in defending such claim.

(b) Nothing in this Agreement shall be construed to prohibit you from filing a charge with or participating in any investigation or proceeding conducted by the federal Equal Employment Opportunity Commission or a comparable state or local agency; provided, however, that you hereby agree to waive your right to recover monetary damages or other personal relief in any such charge, investigation or proceeding, or in any related complaint or lawsuit, filed by you or by anyone else on your behalf.

(c) This Agreement, including the general release and waiver of claims set forth in this Section 8, and the Supplemental Release, create legally binding obligations, and the Company and its Affiliates therefore advise you to consult an attorney before signing this Agreement or the Supplemental Release. In signing this Agreement, you give the Company and its Affiliates assurance that you have signed it voluntarily and with a full understanding of its terms; that you have had sufficient opportunity of not less than twenty-one (21) days before signing it, to consider its terms and to consult with an attorney, if you wished to do so, or to consult with any other of those persons to whom reference is made in Section 6(c) above; and that you have not relied on any promises or representations, express or implied, that are not set forth expressly in this Agreement.

(d) You agree to sign the general release and waiver of claims in the form attached hereto as Exhibit C (the "Supplemental Release") within seven (7) days following the Separation Date, which will be at least twenty-one (21) days following the date of your initial receipt of a copy of this Agreement and the Supplemental Release. You further agree that a signed and unrevoked Supplemental Release is an express condition to your receipt and retention of the severance benefits described in Section 3 above. You agree that you have had not less than twenty-one (21) days from the date of your initial receipt of the Supplemental Release to consider the terms of the Supplemental Release and to consult with an attorney, if you wish to do so, or to consult with any other of those persons to whom reference is made in Section 6(c) of this Agreement. You may not sign the Supplemental Release before the Separation Date.

9. **Miscellaneous.**

(a) This Agreement, including the Supplemental Release, constitutes the entire agreement between you and the Company or any of its Affiliates, and supersedes all prior and contemporaneous communications, agreements and understandings, whether written or oral, with respect to your employment, its termination and all related matters, excluding only the Continuing Obligations and, with respect to any outstanding equity, any applicable award agreements and plan documents, in each case which shall remain in full force and effect in accordance with their terms, except as expressly modified herein.

(b) This Agreement may not be modified or amended, and no breach shall be deemed to be waived, unless agreed to in writing by you and an expressly authorized representative of the Company. The captions and headings in this Agreement are for convenience only, and in no way define or describe the scope or content of any provision of this Agreement.

(c) This Agreement may be executed in counterparts, each of which together shall constitute a single agreement. A signed agreement transmitted by facsimile, electronically in .pdf format or by similar means shall be treated as an original.

[Signature page immediately follows.]

If the terms of this Agreement are acceptable to you, please sign, date and return it to me within seven (7) days following the Separation Date. You may revoke this Agreement at any time during the seven (7)-day period immediately following the date of your signing by notifying me in writing of your revocation within that period, and this Agreement shall not become effective or enforceable until that seven (7)-day revocation period has expired. If you do not revoke this Agreement, then, on the eighth (8th) day following the date that you signed it, this Agreement shall take effect as a legally binding agreement between you and the Company on the basis set forth above. You agree that if there have been any changes to a prior version of this Agreement (material or immaterial), the 21-day consideration period will not be reset.

Sincerely,
MACOM Technology Solutions Inc.

By: /s/ Ambra R. Roth

Name: Ambra R. Roth
Title: Vice President, General Counsel and Secretary

Accepted and agreed:

Signature: /s/ Preetinder Virk
Preetinder Virk

Date: 8/6/2019

Attachments:

Letter Regarding Benefits on Termination

GENERAL RELEASE AGREEMENT

In consideration for and as a condition precedent to my receipt of the severance payments and benefits to be provided to me by MACOM Technology Solutions Inc. ("MACOM") pursuant to Section 7 of that certain letter agreement between MACOM and me, dated December 11, 2013 (the "Offer Letter") and as set forth in the attached letter dated August 5, 2019, to which I am not otherwise entitled, I, on behalf of myself and my heirs, spouse, executors, administrators, beneficiaries, personal representatives, agents and assigns, hereby completely release and forever discharge MACOM, its predecessors (including but not limited to Mindspeed Technologies, LLC), successors, affiliates, subsidiaries and/or related entities and each of its and their past, present, and future officers, directors, stockholders, agents, employees, attorneys, insurers, employee benefit plans, partners, administrators, agents, trustees, representatives, successors and assigns, each individually and in their formal capacities (collectively with MACOM, the "Releasees") from any and all claims of any and every kind, nature, and character, known or unknown, foreseen or unforeseen, arising from, connected with or related to the dealings between me and any of the Releasees prior to the date of this General Release Agreement (this "Release").

Without limiting the generality of the foregoing, I also specifically release the Releasees from any and all claims arising out of my offer of employment, my employment or other association, or the termination of my employment or other association with any of the Releasees, including but not limited to claims for wrongful discharge, claims related to any contracts of employment, express or implied, claims for breach of privacy, defamation or any other tort, claims for attorneys' fees and costs, claims under the laws of the state or states where I have provided services to any of the Releasees relating to wages and hours, compensation, overtime, commissions and breaks, claims relating to leaves of absence and reasonable accommodation, and claims relating to harassment, discrimination, retaliation and/or civil rights.

This Release also includes, but is not limited to, any and all claims arising under any federal, state and/or municipal law, regulation, ordinance or common law, including but not limited to any claims under Title VII of the Civil Rights Act of 1964, the Equal Pay Act, the Family and Medical Leave Act, the Americans With Disabilities Act, the Fair Labor Standards Act, the False Claims Act, the Age Discrimination in Employment Act (the "ADEA"), the Older Workers Benefit Protection Act (the "OWBPA"), the Worker Adjustment and Retraining Notification Act, the California Fair Employment and Housing Act, the Massachusetts Fair Employment Practices Act, the Texas Employment Discrimination Law, the New Jersey Law Against Discrimination, the New Hampshire Law Against Discrimination, the New York Human Rights Act, the Oregon Fair Employment Act, and any other federal, state or local statute, regulation, ordinance or common law. I understand that the only claims that are not covered by this Release are claims expressly exempted by law, such as claims that may arise under the ADEA after the effective date of this Release, unemployment insurance claims or certain workers' compensation claims, or claims exempted by the express terms of a written benefit plan.

I expressly waive and release any rights or benefits that I have or may have under Section 1542 of the California Civil Code, which provides as follows: "A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release and that, if known by him or her, would have materially affected his or her settlement with the debtor or released party." Thus, notwithstanding the provisions of Section 1542, and for the purpose of implementing a full and complete release and discharge of all Releasees, I expressly acknowledge that this Release is intended to include in its effect, without limitation, all claims which I do not know or suspect to exist in my favor against the Releasees, or any of them, at the time of execution of this Release, and that this Release contemplates the extinguishment of any such claims.

I agree that I will not file or cause to be filed any claims, actions, lawsuits, or legal proceedings against any of the Releasees involving any matter occurring up to or on the date of this Release or involving any continuing effects of any acts or practices that may have arisen or occurred before the date of this Release. I further agree that I will not participate in a representative capacity, or join or participate as a member of a class, collective or representative action instituted by someone else against any of the Releasees, and will expressly opt-out of any such proceeding. Notwithstanding the foregoing, nothing in this Release shall prohibit me from contacting, filing of claims with, providing information to or participating in any proceeding before the federal Equal Employment Opportunity Commission, Securities and Exchange Commission or any other government agency; provided, however, that I hereby waive any right to recover monetary damages or other personal relief in connection with any such claims or proceedings, with the exception of an award for information provided pursuant to a whistleblower protection law. This Release also does not preclude a court action, claim or other legal proceeding to challenge the validity of this Release. If I file a claim, action, lawsuit or legal proceeding in violation of this paragraph, other than a claim pursuant to the ADEA or the OWBPA, I shall be obligated to return all consideration received for this Release and will be liable for attorney's fees, costs and expenses incurred by the Releasees or their insurer(s) in defending such claim.

This Release and its attachments constitutes the entire agreement between the Releasees and me on the matters addressed in this Release, provided, however, that I shall remain bound by any agreements related to confidentiality, return of property, non-competition, non-solicitation, no-hire, ownership of inventions, and/or ownership/assignment of intellectual property rights, and mutual binding arbitration that I signed with respect to any of the Releasees. I have not been influenced to sign this Release by, nor am I relying on, any agreement, representation, statement, omission, understanding, or course of conduct by MACOM or any other Releasee that is not expressly set forth in this Release.

I understand and agree that this Release should not be deemed or construed at any time, or for any purpose, as an admission of any liability or wrongdoing by any Releasee or by me. I also agree that if any provision of this Release is deemed invalid, the remaining provisions will still be given full force and effect. This Release cannot be orally modified, orally revised, or orally rescinded, and can only be amended in a written instrument signed by both me and an authorized representative of MACOM. The terms and conditions of this Release will be interpreted and construed in accordance with the law of the state in which I work.

Before signing this Release, I have obtained sufficient information to intelligently exercise my own judgment about whether to sign it, including but not limited to the information set forth in Section 7 of the Offer Letter. I acknowledge that MACOM has advised me to consult an attorney before signing this Release. I acknowledge that MACOM has given me twenty-one (21) days in which to consider this Release and explained to me that if I decide to sign this Release, it should not be dated, signed and returned until after the date that my employment terminates, and if I sign this Release prior to the end of the twenty one (21) day period, I have done so voluntarily and of my own free will. I understand that once I sign this Release, I shall have seven (7) calendar days from the date of my signature to revoke this Release. Notice of revocation must be in writing, and submitted to MACOM within the seven-day period. This Release shall not become effective or enforceable, and severance benefits otherwise payable in respect of this Release shall not become payable, until such revocation period has expired. I acknowledge that the consideration given for this Release is in addition to anything of value to which I was already entitled absent my signing, delivering and not revoking this Release.

At all times following the signing of this Release, I shall not engage in any disparagement or vilification of any Releasee, my employment experience with any Releasee, or any Releasee's products, services, agents, representatives, directors, officers, stockholders, attorneys, employees, or affiliates, and I represent that I shall refrain from making any false, negative, critical or otherwise disparaging statements, implied or expressed, concerning the management style, methods of doing business, role in the community, treatment

of employees or the circumstances and events regarding any separation, with regard to any Releasee. For purposes of this Paragraph, “disparagement” or “disparaging” shall refer to the making of any statements or insinuations, or undertaking any conduct, that would tend to lessen the standing or stature of an institution or person in the eyes of an ordinary citizen. I acknowledge that I further agree to do nothing that would damage any Releasee’s business reputation or good will, nor will I make any statements to the press regarding the Releasees. For the avoidance of doubt, I further acknowledge that I will not make or post any disparaging comments regarding the Releasees in any sort of internet posting or social media forum, such as Facebook, LinkedIn, Twitter, Glassdoor.com, Monster.com, or any similar internet website or online platform. The provisions of this paragraph, however, shall not apply to communications with the Equal Employment Opportunity Commission (“EEOC”) or a state or local anti-discrimination agency, nor shall such provisions (or any provision of this Release) prohibit me from reporting possible violations of federal law or regulation to any government agency or entity, including but not limited to the Department of Justice, the Securities and Exchange Commission, the Congress and any agency Inspector General, or making other disclosures that are protected under the whistleblower provisions of federal law or regulation. I expressly acknowledge and agree that if I engage in any conduct in violation of this section, I shall be obligated to return the consideration received under this Release and will be liable for attorneys’ fees and costs incurred by MACOM or its insurer(s) in enforcing their rights under this paragraph, as well as any actual damages suffered by MACOM as a result of my conduct. The Release shall otherwise remain in full force and effect.

I represent and warrant that I have returned all MACOM property and Confidential Information (as defined in the MACOM Confidentiality, Non-Solicitation, Non-Interference and Invention Assignment Agreement in Connection with Severance attached hereto, which I am signing concurrently with this Release) to MACOM, and that I neither possess nor will use any such MACOM property or Confidential Information after the date of this Release. The provisions of this paragraph, however, shall not apply to communications with the EEOC or a state or local anti-discrimination agency, nor shall such provisions prohibit me from reporting possible violations of federal law or regulation to any government agency or entity, including but not limited to the Department of Justice, the Securities and Exchange Commission, the Congress and any agency Inspector General, or making other disclosures that are protected under the whistleblower provisions of federal law or regulation. I further understand that, pursuant to 18 USC Section 1833(b), I shall not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that is made: (a) in confidence to a federal, state, or local government official, either directly or indirectly, or to an attorney, and solely for the purpose of reporting or investigating a suspected violation of law; or (b) in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. Further, I understand that an individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual: (i) files any document containing the trade secret under seal; and (ii) does not disclose the trade secret, except pursuant to court order.

I have read this Release, and I understand all of its terms. I further acknowledge and agree that I have signed this Release voluntarily, without coercion, and with full knowledge of its significance. I am of sound mind and competent to manage my legal, personal and business affairs and enter into a binding agreement in this regard, and am not currently prevented from doing so by the effects of any intoxicant, drug, medication, health condition or other influence.

I agree that any breach of this Release may result in irreparable injury to the Releasees for which there is no adequate remedy at law and that in the event of such a breach, the Releasees in addition to any other rights or remedies that they may have, shall be entitled to a temporary restraining order and/or preliminary or permanent injunction, restraining me from violations of this Release. I also agree that if I violate this Release, the Releasees will be entitled any damages arising from such breach and shall also be entitled to recover

their costs and expenses, including attorneys' fees, that are incurred in enforcing their rights under this Release. Each Releasee shall have an independent right to enforce the terms of this Release against me, without need of any consent or other action by any other Releasee.

I acknowledge that MACOM may have a legal obligation to report the terms of this Release to the federal government pursuant to Section 111 of the Medicare, Medicaid and SCHIP Extension Act of 2007 (MMSEA). I represent and warrant that no Medicare or Medicaid liens, claims, demands, subrogated interests, or causes of action of any nature or character exist or have been asserted arising from or related to my employment with MACOM or arising from any claim released above. I further agree that I and not the Releasees shall be responsible for satisfying all such liens, claims, demands, subrogated interests, or cause of action that may exist or have been asserted or that may in the future exist or be asserted.

[Remainder of Page Intentionally Left Blank]

EMPLOYEE'S ACCEPTANCE OF RELEASE

I have carefully read, fully understand, and voluntarily agree to all of the terms of this Release in exchange for the severance benefits to which I would not otherwise be entitled.

[TO BE SIGNED ON OR WITHIN 7 DAYS AFTER SEPARATION DATE]

11/11/19 /s/ Preetinder S. Virk

Date Signature

Preetinder S. Virk

Printed Name

**MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
RESTRICTED STOCK UNIT AWARD NOTICE
2012 OMNIBUS INCENTIVE PLAN
(Time-Based and Performance-Based)**

MACOM Technology Solutions Holdings, Inc. (the “*Company*”) has granted to you a Restricted Stock Unit Award (the “*Award*”). The Award is subject to all the terms and conditions set forth in this Restricted Stock Unit Award Notice (the “*Award Notice*”), the Restricted Stock Unit Award Agreement and the Company’s 2012 Omnibus Incentive Plan (the “*Plan*”), which are either attached hereto or have been made available to you via the electronic brokerage account you accessed through www.etrade.com to accept this Award electronically, and which are hereby incorporated into the Award Notice in their entirety.

Participant: _____
Grant Date: _____
Number of Time-Based Restricted Stock Units: _____
Target Number of Performance-Based Restricted Stock Units: _____

Vesting Schedule for Time-Based Restricted Stock Units: The Time-Based Restricted Stock Units will vest with respect to the number of Units on the Vesting Dates indicated below:

Vesting Date	Number of Restricted Stock Units Vesting
_____	_____
_____	_____
_____	_____
_____	_____

Vesting Schedule for Performance-Based Restricted Stock Units: The number of Performance-Based Restricted Stock Units that become earned and vested (if any) will be determined in accordance with the performance measures, targets and methodology set forth in *Exhibit A* attached hereto.

Additional Terms/Acknowledgement: You acknowledge receipt of, and understand and agree to, the Award Notice, the Restricted Stock Unit Award Agreement and the Plan. You further acknowledge that as of the Grant Date, the Award Notice, the Restricted Stock Unit Award Agreement and the Plan set forth the entire understanding between Participant and the Company regarding the Award and supersede all prior oral and written agreements on the subject.

MACOM TECHNOLOGY SOLUTIONS
HOLDINGS, INC.

PARTICIPANT

By:

Name:

Its:

Taxpayer ID:

Additional Documents:

Address:

1. Restricted Stock Unit Award Agreement
2. 2012 Omnibus Incentive Plan
3. Plan Summary

**MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.
2012 OMNIBUS INCENTIVE PLAN**

RESTRICTED STOCK UNIT AWARD AGREEMENT

Pursuant to your Restricted Stock Unit Award Notice (the “**Award Notice**”) and this Restricted Stock Unit Award Agreement (this “**Agreement**”), MACOM Technology Solutions Holdings, Inc. (the “**Company**”) has granted you a Restricted Stock Unit Award (the “**Award**”) under its 2012 Omnibus Incentive Plan (the “**Plan**”) for the number of Time-Based Restricted Stock Units and the target number of Performance-Based Restricted Stock Units indicated in your Award Notice. Capitalized terms not explicitly defined in this Agreement but defined in the Plan shall have the same definitions as in the Plan.

The details of the Award are as follows:

1. Vesting and Settlement

The Award will vest and become payable according to the vesting schedule set forth in the Award Notice and **Exhibit A** thereto, as applicable (the “**Vesting Schedule**”). One share of the Company’s Common Stock will be issuable for each Restricted Stock Unit that vests and becomes payable. Restricted Stock Units that have vested and are no longer subject to forfeiture according to the Vesting Schedule are referred to herein as “**Vested Units**.” Restricted Stock Units that have not vested and remain subject to forfeiture under the Vesting Schedule are referred to herein as “**Unvested Units**.” The Unvested Units will vest (and to the extent so vested cease to be Unvested Units remaining subject to forfeiture) and become payable in accordance with the Vesting Schedule (the Unvested and Vested Units are collectively referred to herein as the “**Units**”). As soon as practicable, but in any event within 30 days, after Unvested Units become Vested Units subject to income tax withholdings (as outlined below), the Company will settle the Vested Units by issuing to you one share of the Company’s Common Stock for each Vested Unit. The Award will terminate and the Units will be subject to forfeiture upon your Termination of Service as set forth in Section 2.

2. Termination of Award upon Termination of Service

Unless the Plan Administrator determines otherwise prior to your Termination of Service, upon your Termination of Service any portion of the Award that has not vested as provided in Section 1 will immediately terminate and all Unvested Units shall immediately be forfeited without payment of any further consideration to you.

3. Securities Law Compliance

3.1 You represent and warrant that you (a) have been furnished with a copy of the Plan and all information which you deem necessary to evaluate the merits and risks of receipt of the Award, (b) have had the opportunity to ask questions and receive answers concerning the information received about the Award and the Company, and (c) have been given the opportunity to obtain any additional information you deem necessary to verify the accuracy of any information obtained concerning the Award and the Company.

3.2 You hereby agree that you will in no event sell or distribute all or any part of the shares of the Company’s Common Stock that you receive pursuant to settlement of this Award (the “**Shares**”) unless (a) there is an effective registration statement under the Securities Act and applicable state securities laws covering any such transaction involving the Shares or (b) the Company receives an opinion of your legal

counsel (concurring in by legal counsel for the Company) stating that such transaction is exempt from registration or the Company otherwise satisfies itself that such transaction is exempt from registration. You understand that the Company has no obligation to you to maintain any registration of the Shares with the SEC and has not represented to you that it will so maintain registration of the Shares.

3.3 You confirm that you have been advised, prior to your receipt of the Shares, that neither the offering of the Shares nor any offering materials have been reviewed by any administrator under the Securities Act or any other applicable securities act (the “**Acts**”) and that the Shares cannot be resold unless they are registered under the Acts or unless an exemption from such registration is available.

3.4 You hereby agree to indemnify the Company and hold it harmless from and against any loss, claim or liability, including attorneys’ fees or legal expenses, incurred by the Company as a result of any breach by you of, or any inaccuracy in, any representation, warranty or statement made by you in this Agreement or the breach by you of any terms or conditions of this Agreement.

4. Transfer Restrictions

Units shall not be sold, transferred, assigned, encumbered, pledged or otherwise disposed of, whether voluntarily or by operation of law.

5. No Rights as Stockholder

You shall not have voting or other rights as a stockholder of the Common Stock with respect to the Units.

6. Independent Tax Advice

You acknowledge that determining the actual tax consequences to you of receiving or disposing of the Units and Shares may be complicated. These tax consequences will depend, in part, on your specific situation and may also depend on the resolution of currently uncertain tax law and other variables not within the control of the Company. You are aware that you should consult a competent and independent tax advisor for a full understanding of the specific tax consequences to you of receiving the Units and receiving or disposing of the Shares. Prior to executing this Agreement, you either have consulted with a competent tax advisor independent of the Company to obtain tax advice concerning the receipt of the Units and the receipt or disposition of the Shares in light of your specific situation or you have had the opportunity to consult with such a tax advisor but chose not to do so.

7. Withholding

You are ultimately responsible for all taxes arising in connection with this Award (e.g., at vesting and/or upon receipt of the Shares), including any domestic or foreign tax withholding obligation required by law, whether national, federal, state or local, including FICA or any other social tax obligation (the “**Tax Withholding Obligation**”), regardless of any action the Company or any Related Company takes with respect to any such Tax Withholding Obligation that arises in connection with this Award. As a condition to the issuance of Shares pursuant to this Award, you will be required to satisfy the Tax Withholding Obligation that arises upon receipt of the Shares or otherwise. The Company may refuse to issue any Shares to you until you satisfy the Tax Withholding Obligation. The Company may withhold from the shares otherwise payable to you with respect to your Vested Units the number of whole shares of the Company’s common stock required to satisfy the minimum applicable Tax Withholding Obligation,

the number to be determined by the Company based on the Fair Market Value of the Company's Common Stock on the date the Company is required to withhold. The Company will require you to satisfy your Tax Withholding Obligation by instructing and authorizing the Company and the brokerage firm determined acceptable to the Company for such purpose to sell on your behalf a whole number of Shares from those Shares issuable to you in payment of Vested Units as the Company determines to be appropriate to generate cash proceeds sufficient to satisfy the Tax Withholding Obligation. Notwithstanding the forgoing, to the maximum extent permitted by law, you hereby grant the Company and any Related Company the right to deduct without notice from salary or other amounts payable to you, an amount sufficient to satisfy the Tax Withholding Obligation.

8. Clawback

By accepting this Award, you acknowledge and agree that this Award and all other awards granted to you under the Plan, any shares issued in respect thereof, and any proceeds and other amounts received in respect of this Award, other awards or such shares are subject to forfeiture and repayment (i) under the Company's Compensation Recoupment Policy, as from time to time amended and in effect; (ii) under any other policy of, or agreement with, the Company or any Related Company that is applicable to you and that provides for the cancellation, forfeiture, disgorgement, repayment or clawback of incentive compensation; and (iii) to the extent required by law or applicable stock exchange listing standards, including, without limitation, Section 10D of the Exchange Act. A copy of the Company's Compensation Recoupment Policy as in effect on the date of this Agreement has been provided to you, which you acknowledge and agree is subject to amendment and/or amendment and restatement from time to time.

9. General Provisions

9.1 Assignment. The Company may assign its forfeiture rights at any time, whether or not such rights are then exercisable, to any person or entity selected by the Company's Board of Directors.

9.2 No Waiver. No waiver of any provision of this Agreement will be valid unless in writing and signed by the person against whom such waiver is sought to be enforced, nor will failure to enforce any right hereunder constitute a continuing waiver of the same or a waiver of any other right hereunder.

9.3 Undertaking. You hereby agree to take whatever additional action and execute whatever additional documents the Company may deem necessary or advisable in order to carry out or effect one or more of the obligations or restrictions imposed on either you or the Units pursuant to the express provisions of this Agreement.

9.4 Successors and Assigns. The provisions of this Agreement will inure to the benefit of, and be binding on, the Company and its successors and assigns and you and your legal representatives, heirs, legatees, distributees, assigns and transferees by operation of law, whether or not any such person will have become a party to this Agreement and agreed in writing to join herein and be bound by the terms and conditions hereof.

9.5 No Employment or Service Contract. Nothing in this Agreement will affect in any manner whatsoever the right or power of the Company, or a Related Company, to terminate your employment or services on behalf of the Company, for any reason, with or without Cause.

9.6 Relationship Between The Plan And Your Employment. Awards made under the Plan and any profits or gains made as a result of such Awards are not pensionable under any pension arrangements of the Company or any Related Company. Participation in this Award is a matter entirely separate from any pension right or entitlement which you may have, and from your terms and conditions of employment.

Participation in the Award shall in no respects whatever affect in any way your pension rights (if any), entitlements or terms or conditions of employment, and in particular (but without limiting the generality of the foregoing words) neither the provisions of the Award Notice, the Plan nor this Agreement shall form part of any contract of employment between you and the Company and/or any Related Company, nor shall it be taken into account for the purpose of calculating any redundancy or unfair dismissal payment or wrongful dismissal payment, nor shall it confer on you any legal or equitable rights whatsoever against the Company or any Related Company.

Participation in the Plan does not impose upon the Company, any Related Company, the Committee or any of their representatives, agents and employees any liability whatsoever (whether in contract, tort, or otherwise howsoever) in connection with:

- (a) the loss of your Award(s) under the Plan;
- (b) the loss of your eligibility to be granted Award(s) under the Plan; and/or
- (c) the manner in which any power or discretion under the Plan is exercised or the failure or refusal of any person to exercise any power or discretion under the Plan.

9.7 Data Protection. By accepting this Award, you hereby consent to personal information obtained in relation to the Plan, the Award Notice and this Agreement being handled by the Company, Related Companies and their delegates, agents or affiliates in accordance with applicable law. Information in relation to you will be held, used, disclosed and processed for the purposes of: (a) managing and administering the Awards you hold under the Plan; (b) complying with any applicable audit, legal or regulatory obligations including, without limitation, legal obligations under company law and anti-money laundering legislation; (c) disclosure and transfer whether in your country of residence or elsewhere (including companies situated in countries which may not have the same data protection laws as your country of residence) to third parties including regulatory bodies, auditors and any of their respective related, associated or affiliated companies for the purposes specified above; (d) or for other legitimate business interests of the Company and Related Companies.

EXHIBIT A

(For Performance-Based Restricted Stock Units Granted on ____, 20__)

This Exhibit A is applicable to the Performance-Based Restricted Stock Units (“**PRSUs**”) granted by MACOM Technology Solutions Holdings, Inc. under the 2012 Omnibus Incentive Plan. Capitalized terms not explicitly defined in this Exhibit A but defined in the Restricted Stock Unit Award Agreement to which this Exhibit A relates shall have the same definitions as set forth therein.

The number of PRSUs that become earned and vested (if any) in each Performance Period will be determined in accordance with the performance measures, targets and methodology set forth herein.

SUBSIDIARIES OF THE REGISTRANT

<u>Name</u>	<u>Jurisdiction of Incorporation</u>
MACOM Technology Solutions Inc.	Delaware
Mindspeed Technologies, LLC	Delaware
Nitronex, LLC	Delaware
BinOptics, LLC	Delaware
MACOM Connectivity Solutions, LLC	Delaware
M/A-COM Technology Solutions International Limited	Ireland
M/A-COM Technology Solutions (UK) Limited	Northern Ireland
M/A-COM Technology Solutions (Holding) Company Limited	Ireland
MACOM Technology Solutions Limited	Ireland
M/A-COM Tech Asia Inc.	Taiwan
MACOM Technology Solutions (Bangalore) Private Limited	India
M/A-COM Technology Solutions (Shanghai) Company Limited	China
MACOM Technology Solutions (HK) Limited	Hong Kong
MACOM Japan Limited	Japan
MACOM Technology Solutions Canada Inc.	Canada
MACOM Technology Solutions S.A.S.	France
Mindspeed Technologies (Mauritius) Limited	Mauritius
MACOM Technology Solutions GmbH	Germany
Mindspeed Technologies Ukraine, LLC	Ukraine
Mindspeed Telecommunications Technologies Development (Shenzhen) Company Limited	China
Mindspeed Technologies India Private Limited	India
MACOM Technology Solutions (India) Limited	India
MACOM Wireless Cayman Limited	Cayman
MACOM Wireless (HK) Limited	Hong Kong

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statements No. 333-216406, No. 333-209610, No. 333-193098, and No. 333-180219 on Form S-8 and Registration Statements No. 333-225509 and No. 333-188728 on Form S-3 of our reports dated November 25, 2019, relating to the consolidated financial statements of MACOM Technology Solutions Holdings, Inc., and the effectiveness of MACOM Technology Solutions Holdings, Inc.'s internal control over financial reporting, appearing in this Annual Report on Form 10-K of MACOM Technology Solutions Holdings, Inc. for the year ended September 27, 2019.

/s/ Deloitte & Touche LLP

Boston, Massachusetts

November 25, 2019

CERTIFICATION OF THE CEO PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Stephen G. Daly, certify that:

1. I have reviewed this annual report on Form 10-K of MACOM Technology Solutions Holdings, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: 11/25/2019

/s/ Stephen G. Daly

Stephen G. Daly

President and Chief Executive Officer

CERTIFICATION OF THE CFO PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, John Kober, certify that:

1. I have reviewed this annual report on Form 10-K of MACOM Technology Solutions Holdings, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: 11/25/2019

/s/ John Kober

John Kober

Senior Vice President and Chief
Financial Officer

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of MACOM Technology Solutions Holdings, Inc. (the "Company") on Form 10-K for the fiscal year ended September 27, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), Stephen G. Daly, as President and Chief Executive Officer of the Company, and John Kober, as Senior Vice President and Chief Financial Officer, each hereby certifies, pursuant to and solely for the purpose of 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company for the period covered by the Report.

/s/ Stephen G. Daly

Stephen G. Daly
President and Chief Executive Officer
11/25/2019

/s/ John Kober

John Kober
Senior Vice President and Chief Financial Officer
11/25/2019