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

FORM 10-K

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

For the fiscal year ended October 1, 2021
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	**27-0306875**
(State or other jurisdiction of incorporation or organization)	*(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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑ Yes ☐ No

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 April 2, 2021, the last business day of the registrant's second fiscal quarter, was approximately $2.8 billion 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 11, 2021 was 69,611,633.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates certain information by reference from the registrant's definitive proxy statement for the 2022 Annual Meeting of Stockholders, which will be filed no later than 120 days after the close of the registrant's fiscal year ended October 1, 2021.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.

ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED OCTOBER 1, 2021

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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, strategic plans and priorities, expectations, anticipated drivers of future revenue growth, industry trends, the potential impacts of COVID-19 on our future operations and results, our plans for use of our cash and cash equivalents and short-term investments, our ability to meet working capital requirements, 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," "MACOM Technology Solutions," "MACOM KV CAPS" 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 Telecommunications ("Telecom"), Industrial and Defense ("I&D") and Data Center industries. Headquartered in Lowell, Massachusetts, with operational facilities throughout North America, Europe and Asia, we design, develop and manufacture differentiated semiconductor products for customers who demand high performance, quality and reliability. We have more than 70 years of application expertise, combined with expertise in analog and mixed signal circuit design, compound semiconductor fabrication (including gallium arsenide ("GaAs"), indium phosphide ("InP") and specialized silicon), advanced packaging and back-end assembly and test. 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 6,000 end customers in three primary markets. Our semiconductor products are electronic components that our customers incorporate into larger electronic systems, such as wireless communication systems including basestations, high capacity optical networks, data center applications, radar, medical systems and test and measurement applications. Our primary end markets are: (1) Telecom, which includes carrier infrastructure such as long-haul/metro, 5G and Fiber-to-the-X ("FTTx")/passive optical network ("PON"), among others; (2) 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 and scientific applications; and (3) Data Center, which includes intra-Data Center, Data Center Interconnect ("DCI") applications, at 100G, 200G, 400G, 800G and higher speeds, enabled by our broad portfolio of analog ICs and photonic components for high speed optical module customers.

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 20 years. We continue to develop new products and technologies to improve our ability to serve our primary markets. Our growth strategy is focused on expanding our product portfolio, 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 assembly and test capabilities coupled with domestic and international external foundry and assembly and test partners. 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, the ISO14001 environmental management standard and the ANSI/ESD S20.20:2014 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 access additional process technologies and provide additional capacity. We believe that our 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 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 these core competencies 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 analog and mixed signal circuits capable of reliable, high-performance RF, microwave, millimeter wave and optical signal transmission and 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 technologies such as heterolithic microwave integrated circuit ("HMIC"), which provides high integration, high power and low loss switching capabilities for our primary markets. More recently, we developed an innovative semiconductor process to support the introduction of a new high voltage capacitor product line, branded as MACOM KV CAPS, which represents the industry's highest voltage silicon-based capacitors.

Our engineers' radar, optical, microwave and millimeter wave system-level design expertise allow 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 and Products

Our core strategy is to develop and innovate high-performance products that address our customers' technical challenges in our primary markets: Telecom, I&D and Data Center. 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 growth in these markets. We expect our revenue in the Telecom market to be driven, in part, by 5G deployments, with continued upgrades and expansion of communications equipment, increasing adoption of bandwidth rich services. We expect our revenue in the I&D market to be driven by the expansion of our product portfolio which services test and measurement, satellite communications, civil and military radar, scientific, medical and other industrial applications. We expect revenue growth in the Data Center market to be driven by the adoption of cloud-based services and the upgrade of data center architectures to 100G, 200G, 400G and 800G interconnects, which we expect will drive adoption of higher speed optical and photonic wireless links.

Telecom. Underlying growth in the Telecom market is driven by the ever-growing need for increased bandwidth to support data rich applications and services such as video conferencing, cloud computing, video-on-demand and social media. Growth in next-generation Internet and Internet of Things applications drives global 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 enables 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 2.5/10/40/100/400 gigabits per second long haul, metro, data center links and 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.

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, RF jammers, electronic countermeasures and smart munitions. Military applications are becoming more sophisticated and requiring more high speed bandwidth, 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 analog design capabilities, technology portfolio, 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. We believe manufacturing products in our Lowell, Massachusetts Trusted Foundry offers us a competitive advantage in the I&D market because of certain customers’ requirements for a domestic supply chain.

Growth in the I&D business is also driven by multi-market applications encompassing industrial, medical, test and measurement and scientific applications, where analog RF, microwave and millimeter wave 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 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.

Data Center. 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 can 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.

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	MAJOR PRODUCT FAMILIES
Telecom	Amplifiers
	Comb Generators
	Control Products
	Crosspoint Switches
	Diodes
	HDcctv Cable Devices
	Limiters
	Passives
	Phase Shifters
	PHY Embedded Processors
	RF Power Products
	SDI Products
	Switch LNAs
	Switches
	Voltage Controlled Oscillators

PRIMARY MARKET	MAJOR PRODUCT FAMILIES
Industrial & Defense	Amplifiers
	Capacitors
	Comb Generators
	Control Products
	Diodes
	Limiters
	Passives
	Phase Shifters
	RF Power Products
	Switches
	Voltage Controlled Oscillators

PRIMARY MARKET	MAJOR PRODUCT FAMILIES
Data Center	Clock and Data Recovery
	Crosspoint Switches
	Lasers
	Modulator Drivers
	Optical Post Amplifiers
	Optical Receivers
	Photonic Devices
	PHY Embedded Processors
	Silicon Photonic Integrated Devices

Sales and Marketing

We employ a global multi-channel sales strategy and support model intended to facilitate 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, applications engineering staff, independent sales representatives and distributors. Sales to our distributors accounted for 35.0%, 45.3% and 33.3% of our revenue in fiscal years 2021, 2020 and 2019, 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. One of our distributors, Richardson RFPD, Inc., ("Richardson"), accounted for 10.7%, 13.5% and 16.1% of our revenue in fiscal years 2021, 2020 and 2019, respectively. Sales to two other resellers, Gateway Tech Company Limited ("Gateway") and Pangaea (H.K.) Limited ("Pangaea"), both individually accounted for 11.5% of our revenue in fiscal year 2020, but did not individually exceed 10% in fiscal years 2021 or 2019. For fiscal years 2021, 2020 and 2019, no direct customer individually accounted for 10% or more of our revenue and sales to our top 25 direct customers accounted for an aggregate of 43.7%, 40.0% and 47.5% of our revenue, 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 of engineering talent to drive innovation and new product development;

- the ability to timely design and deliver products and solutions that meet or exceed 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 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, millimeter wave and photonic applications, some of whom have greater financial resources and scale than us. We expect competition in our markets to change 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.

In the Telecom and Data Center markets, we compete with NXP Semiconductors N.V. ("NXP"), Marvell Technology Inc. ("Marvell"), Maxlinear Inc. ("Maxlinear"), Broadcom Inc. ("Broadcom") and Semtech Corporation ("Semtech"). In the I&D market, we compete with Analog Devices, Inc. ("ADI"), Wolfspeed, Inc. ("Wolfspeed"), 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. We also frequently ship products from our inventory shortly after receipt of an order, which we refer to as "turns business." 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 October 1, 2021, we had 607 U.S. and 162 foreign issued patents and 95 U.S. and 150 foreign pending patent applications covering elements of semiconductor devices, 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 2021 to 2040. 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 enables us to offer proprietary processes, and 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 allows 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 operations, provides access to a wider array of 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, experiences capacity constraints or temporary facility closures, 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, and, in October 2021, it received an IATF 16949 Automotive Quality Management System certification.

The ESD Association provides standards for safe and proper handling of electrostatic discharge ("ESD") in electronic manufacturing environments. Our following locations have each received ANSI/ESD S20.20:2014 certification: Lowell, Massachusetts; Ann Arbor, Michigan; Allentown, Pennsylvania; Morrisville, North Carolina; and Hsinchu, Taiwan.

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.

Human Capital

Employees. As of October 1, 2021, we employed approximately 1,100 individuals worldwide, including approximately 380 in research and development. We have employees across 17 countries, with 71% in North America, 20% in Asia Pacific and 9% in Europe. None of our domestic employees are represented by a collective bargaining agreement; however, as of October 1, 2021, approximately 20 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.

Approximately 70% and 30% of our workforce is male and female, respectively. Females represented approximately 10% of our senior management and approximately 15% of our engineering roles.

Corporate Culture and Employee Engagement. We are committed to fostering a corporate culture that encourages and seeks the betterment of the Company and the communities in which we conduct business. Through our charitable giving program, we donate up to 5,000 volunteer hours to the communities in which we operate, by allowing each employee to volunteer up to eight hours per year during working hours on approved charitable activities. Additionally, our employees engage directly with the community, volunteering their time to a number of organizations. We strive to foster a sense of community and well-being that encourages our employees to focus on both their and the Company's long-term success. We realize that continuous engagement with our employees in a transparent, collaborative manner that builds trust and fosters thoughtful discussion is vital to driving successful outcomes. Executive management regularly conducts town hall-style meetings with employees to address business operations, strategy, market conditions and other topics. This format encourages open dialogue and provides employees with an opportunity to ask questions and voice opinions and ideas.

Retention and Development. We devote substantial efforts to retaining, motivating and supporting our employees, including by providing tuition and professional development reimbursement and opportunities for internal growth and advancement. Performance reviews are conducted at least annually for all employees, during which employees and managers address goals, development opportunities, strengths and areas for improvement. We have also maintained an internship program that supports the professional development of interns and serves as a recruitment tool for full-time employees. We monitor voluntary attrition as an indicator of employee engagement. During fiscal year 2021, our voluntary attrition rate was approximately 9%.

Compensation. Our compensation policies recognize and reward individual and collective contributions to our growth and success. We offer, among other things, competitive and balanced compensation programs commensurate with those of our peers and competitors. This includes, but is not limited to, well-rounded healthcare, prescription drug and disability insurance benefits for our employees and their families, a 401(k) plan for our U.S.-based employees and equivalent retirement savings programs for our non-U.S.-based employees with a matching contribution by the Company, an employee stock purchase plan in certain jurisdictions, corporate bonus and equity incentive programs, competitive paid time-off benefits, a parental leave program following the birth, adoption or fostering of a child and an employee assistance plan that provides professional support, access to special programs and certain resources to our employees experiencing personal, work, financial or family-related issues.

Diversity, Equity and Inclusion (DE&I). We have a diverse employee base, serving a wide variety of customers across multiple geographies. We are strengthened by the broad diversity of our employees' perspectives, backgrounds, cultures, lifestyles and experiences.

We continue to create a culture of DE&I in the workplace in order to promote and effect change at the corporate and community levels. We support establishing a work environment where everyone has equal opportunities to learn and grow. Our DE&I efforts are guided by the following principles:

- Diversity is the representation of different people in an organization.
- Equity is ensuring that everyone has fair, just and equal opportunities at work.

- Inclusion is ensuring that everyone has an equal opportunity to contribute to and influence every part and level of a workplace.
- Belonging is ensuring that everyone feels safe and welcome at work.

We regularly use our employee newsletter and communications meetings to share information, opportunities and updates with our workforce on our DE&I and other initiatives. We are committed to providing equal opportunity in all aspects of employment and do not tolerate discrimination or harassment of any kind. We maintain a policy against unlawful discrimination, harassment and retaliation which sets forth our position on the prohibition of all forms of discrimination and harassment in the workplace.

Safety, Health and Well-being. Providing our employees with a healthy and safe working environment is essential. Our goal is to reduce the potential for injury or illness by maintaining safe working conditions, such as providing proper tools and training to all employees. Additionally, we offer resources to our employees to encourage healthy habits, such as health coaches, wellness incentives and a diabetes prevention program.

As a global organization, we are committed to following local government guidance related to COVID-19 in every jurisdiction where we operate, including adherence to requirements for temporary site closures. We have focused on and continue to focus on ensuring the health and safety of our global workforce during the COVID-19 global pandemic, including, among other things, by facilitating, and for certain locations, requiring certain employees to work from home, directing social distancing and implementing extensive health screening and sanitation policies at our facilities to ensure the safety of all essential employees. As part of our COVID-19 response-plan, we implemented onsite health screening, Company-funded COVID-19 testing and onsite COVID-19 vaccination in our Lowell, Massachusetts headquarters. We also supported our workforce with advice and guidance on protecting their own health and the health of their families. We will continue to prioritize the health and safety of our employees during the remainder of the COVID-19 pandemic and thereafter.

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, millimeter wave 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 dates back over 70 years to the founding of Microwave Associates, Inc. and the MACOM brand dates back over 30 years.

We completed several 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”) in order to expand our business in enterprise and Cloud Data Center applications.

In October 2017, following the acquisition of AppliedMicro, we divested AppliedMicro's Compute business (the “Compute business”) and received an equity interest in Ampere Computing Holdings LLC (“Ampere”).

In August 2017, we completed the acquisition of Picometrix LLC 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 growth, expand our technology portfolio, grow our addressable market and create stockholder value.

During the fiscal quarter ended June 28, 2019, we committed to a plan designed to strategically realign, streamline and improve certain of our business and operations, including reducing our workforce by approximately 250 employees, exiting six development facilities in France, Japan, the Netherlands, Florida, Massachusetts and Rhode Island, reducing certain development activities for one of our product lines and no longer investing in the design and development of optical modules and subsystems for Data Center applications (the “2019 Plan”). These restructuring actions were completed in fiscal year 2020.

COVID-19 Impact

COVID-19 has spread throughout areas of the world where we operate and resulted in authorities implementing numerous measures to try to contain the virus. As a result of these measures and the spread of COVID-19, we have modified our business practices and may further modify our practices as required, or as we determine appropriate. While these measures, as well as other disruptions, have impacted our operations, the operations of our customers and those of our respective vendors and suppliers, such impacts did not, through the fiscal year ended October 1, 2021, have a material impact on our consolidated operating results.

Given the significant continued economic uncertainty and volatility created by the pandemic, it is difficult to predict the nature and extent of impacts on the demand for our products. The continued spread of COVID-19 could cause a further economic slowdown or recession and could result in adverse impacts to our overall business, such as increased credit and collectability risks, adverse impacts on our supply chain, asset impairments, declines in the value of our financial instruments and adverse impacts on our capital resources. The degree to which the COVID-19 pandemic impacts our future business, financial condition, results of operations, liquidity and cash flows will depend on future developments, which are highly uncertain and cannot be accurately predicted, including the duration and spread of the outbreak, its severity, any resurgence of COVID-19 cases, including as a result of variant strains of the underlying virus, actions taken to contain the virus or treat its impact, the availability and efficacy of vaccines against COVID-19, how quickly and to what extent normal operating conditions can resume, and the economic impact on local, regional, national and international markets.

For additional information on risk factors that could impact our future results, please refer to "*Item 1A - Risk Factors*" in this Annual Report.

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 General Business Conditions

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, among other things, on our ability to timely develop products for existing and new markets that meet customers' performance, reliability and price expectations. In addition, the average selling prices of our products may 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 introduce, in successive years, products that ship in volume, our revenue will likely not grow and may decline significantly and rapidly. The development of 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 accurate prediction of market requirements, changes in technology and evolving standards; the availability of qualified product designers and process technologies needed to solve design challenges in a cost-effective, reliable manner; our ability to design products that meet customers' requirements; our ability to successfully design and manufacture products at competitive prices and volumes; our customers' acceptance of our product designs; the acceptance of our customers' products by the market and the lifecycle of such products; the strength of and 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 over one year, and requires significant investment in engineering, as well as sales and marketing, which may not be recouped. Our failure to anticipate or timely develop new or enhanced products or technologies in response to technological shifts could result in decreased revenue and others obtaining design wins. As a result, 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.

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. In particular, the COVID-19 pandemic has caused shortages of certain semiconductor components and delays in shipments. If key components, materials or services are unavailable, our costs could increase and our revenue could decline.

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. Any catastrophic loss or significant damage to any of these facilities, particularly our Lowell, Massachusetts headquarters, could materially 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, and adversely affect our business and financial results, revenue and profitability.

We are subject to supply, 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, as our forecasts of demand are then based on estimates provided by multiple parties. If we overestimate our customers' requirements, we may have excess inventory, which could lead to obsolete inventory, write-downs and unexpected costs. Conversely, if we underestimate our customers' requirements or are not able to secure components, materials and/or fabrication facility capacity, we may have inadequate inventory, which could lead to foregone revenue opportunities, loss of potential market share and damage to customer relationships. Furthermore, obtaining additional supply in the face of any component shortages may be costly or impossible, particularly in the short term, which could prevent us from fulfilling orders in a timely manner or at all. If our own supply chain or others from whom our customers source are unable to deliver required components to our customers, then our customers may delay or cancel their product orders from us. 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.

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. Increased sales of lower-margin products, increases in raw material costs, changes in manufacturing yields and other factors can reduce our gross margins from time to time, which could have an adverse impact on our business, financial condition and results of operations 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, including: general economic growth or decline in the U.S. or foreign markets; reduction or cancellation of orders by customers; the amount of new customer orders we book and ship in any particular fiscal quarter; relative linearity of our shipments within any particular fiscal quarter; the gain or loss of a key customer or significant changes in demand and/or fluctuations in the markets we serve; fluctuations in the levels of component inventories held by our customers and accurate forecasting by customers; 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; success of our investments in research and development; 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; effects of seasonal and other changes in customer demand; effects of competitive pricing pressures, including decreases in average selling prices of our products; loss of key personnel or the shortage of available skilled workers; our failure to remain abreast of new and improved semiconductor process technologies; failure of our partners in strategic alliances, which may prevent us from achieving commercial success in such alliance; 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; changes in laws and regulations in the U.S. and other countries, or the interpretations thereof; and the effects of war, natural disasters, global pandemics, acts of terrorism, macroeconomic uncertainty or decline or geopolitical unrest.

The foregoing factors are difficult to forecast. These and similar 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 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 it 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. The rate and extent to which these markets will grow, if at all, is uncertain. For example, we have focused significant internal resources to meet potential product demand in the Cloud Data Center Market, but our ability to capitalize on this and other market opportunities in 100G optical networks and GaN technology will depend on, among other things, the future size and actual growth rates of these markets, the next generation technologies selected by customers, the timing of network upgrades in these markets and the pace of adoption of our products in these markets. 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.

The effects of the COVID-19 pandemic have materially impacted, and will likely further impact in the future, how we operate our business, and the extent to which this will impact our business, financial condition and results of operations remains uncertain.

COVID-19, the disease caused by the coronavirus identified in late 2019, has spread throughout areas of the world where we operate and resulted in authorities implementing numerous measures to try to contain the virus, such as travel bans and restrictions, quarantines, stay-at-home directives and lockdowns and business shutdowns. These measures, as well as transportation disruptions, including reduced availability of air transport, port closures and increased border controls, have impacted, and will likely further impact in the future, our operations, the operations of our customers and those of our respective vendors and suppliers. There is considerable uncertainty regarding the duration and effect of existing measures and potential future measures, and depending on the magnitude of the disruptions, our business, financial condition and results of operations may be materially and adversely affected.

The ongoing impact of the COVID-19 pandemic is fluid and uncertain, and it could adversely affect our customers’ ability or willingness to purchase our products, delay prospective customers’ purchasing decisions, negatively impact our supply chain, restrict our ability to provide certain products or delay the introduction of new product offerings. In addition, there are ongoing global impacts resulting from the pandemic, including shortages of semiconductor components and delays in shipments, which has impacted product production and delivery to customers. The spread of COVID-19 has caused us to modify our business practices, including restricting employee travel, canceling physical participation in meetings, events and conferences, requiring most employees to work from home and operating with a limited number of employees in certain locations, which could result in production delays and limit our ability to satisfy orders for certain products. We may take further actions as may be required by government authorities or that we determine are in the best interests of our employees, customers and suppliers. Moreover, the COVID-19 pandemic or any worsening of the global economic environment as a result thereof may have the effect of exacerbating other risks described elsewhere in this Part I, “*Item 1A - Risk Factors.*”

The degree to which the COVID-19 pandemic may impact our business, financial condition, results of operations, liquidity and cash flows will depend on future developments, which are highly uncertain and cannot be predicted, including the duration and spread of the outbreak, its severity, any resurgence of COVID-19 cases, including as a result of variant strains of the underlying virus, actions taken to contain the virus or treat its impact, the availability and efficacy of vaccines against COVID-19 and how quickly and to what extent normal operating conditions can resume. Furthermore, while the potential impacts of the COVID-19 pandemic may be difficult to assess or predict, it has resulted in a significant disruption of global financial markets, and any resulting recession or long-term market correction could materially impact the value of our common stock, and could result in adverse impacts such as increased credit and collectibility risks, adverse impacts on our suppliers, asset impairments, declines in the value of our financial instruments and adverse impacts on our capital resources. There are no comparable recent events that provide guidance as to the effect the COVID-19 pandemic may have, and, as a result, the ultimate impact of the outbreak on our business, financial condition and results of operations is highly uncertain and subject to change.

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

In the fiscal year ended October 1, 2021, no direct customer individually accounted for 10% or more of our revenue and sales to our top 10 direct and distribution customers accounted for an aggregate of 48.9% 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 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." Failure to obtain a design win 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. Furthermore, any difficulties our customer may experience in completing its own qualifications may delay or prevent us from translating the design win into revenue. 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 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.

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, damage to our customer or supplier relationships, the loss of or delay in market acceptance of our products, costly litigation, 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, 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.

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

We rely on our information technology systems for the effective operation of our business and for the secure maintenance and storage of confidential data relating to our business. Although our internal information technology team actively takes steps to protect our information security systems, experienced programmers or hackers may be able to penetrate our security controls, and develop and deploy viruses, worms and other malicious software programs that compromise our confidential information or that of third parties and cause a disruption or failure of our information technology systems. In addition, we have in the past and may in the future be subject to "phishing" attacks in which third parties send emails purporting to be from reputable companies to obtain personal information and infiltrate our systems to initiate wire transfers or otherwise obtain proprietary or confidential information. A number of large, public companies have recently experienced losses based on ransomware and/or phishing attacks and other cyber-attacks. Any compromise of our information technology systems could result in unauthorized publication of our confidential business or proprietary information, result in the unauthorized release of customer, supplier or employee data, result in violations of privacy or other laws, expose us to a risk of litigation, cause us to incur direct losses if attackers access our bank or investment accounts, or damage our reputation. The cost and operational consequences of implementing data protection measures either as a response to specific breaches or as a result of evolving risks could be significant. In addition, our inability to use or access our information systems at critical points in time could adversely affect the timely and efficient operation of our business. Any delayed sales, significant costs or lost customers resulting from a technology failure could adversely affect our business, operations and financial results.

Third parties with which we conduct business, such as foundries, assembly and test contractors, and distributors, have access to certain portions of our sensitive data. In the event that these third parties do not properly safeguard our data that they hold, security breaches could result and negatively impact our business, operations and financial results.

The outcome of any 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 may be a party to certain litigation matters. Any such disputes, litigations, investigations, administrative proceedings or enforcement actions 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. 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 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 October 1, 2021, we had a credit facility consisting of a term loan facility with an outstanding principle balance of $120.8 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 that 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; 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, any of which could place us at a competitive disadvantage relative to our competitors that are not subject to such restrictions. 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.

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. Any failure of our corporate infrastructure could have a material adverse effect on our business, financial condition and results of operations.

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.

Risks Relating to International 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 of the U.S., including currency controls, currency exchange rate fluctuations, new or potential international trade agreements, tariffs, required import and export licenses, and other related international trade restrictions and regulations. Further, there is a risk that language barriers, cultural differences and other factors associated with our global 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 certain 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 54.2% of our revenue for the fiscal year ended October 1, 2021. 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, domestic semiconductor supply chain initiatives, health crisis 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 May 2019, the BIS added Huawei Technologies Co. Ltd. ("Huawei") and many of its affiliates to its Entity List (and subsequently added additional Huawei affiliates), which effectively blocks exports of U.S. products to Huawei and such affiliates. Such actions in the future, as well as other changes in Chinese laws and regulations, including actions in furtherance of China's stated policy of reducing its dependence on foreign semiconductor manufacturers, could increase the cost of doing business in China, foster the emergence of additional Chinese-based competitors and/or decrease the demand for our products in China, which could have a material adverse effect on our business and results of operations.

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, global pandemics, 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, labor issues and transportation and other disruptions, 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. 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.

Risks Relating to Production Operations

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 Ann Arbor, Michigan site. 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 level of demand for our products; our ability to expand and contract our facilities and purchase commitments in a timely and cost-effective manner; 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 avoid complications; the availability of raw materials; the availability and continued operation of key equipment; our manufacturing cycle times and yields; political and economic risks; the occurrence of 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. The effectiveness of our supply chain could be adversely affected by such issues and harm our 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 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. Conversely, 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.

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. Compound semiconductor technology tends to be more expensive than silicon technology. 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; concerns related to manufacturing costs and yields; unfamiliarity with our design and manufacturing processes; or uncertainties about the relative cost effectiveness of our products. 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. If our products fail to achieve or maintain market acceptance for any of the above reasons, our results of operations will suffer.

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, among other things, 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. In addition, if we are unable to comply with security clearance requirements, we might be unable to perform these contracts or compete for other projects of this nature, which could adversely affect our revenue.

Risks Relating to Research and Development, Intellectual Property and New Technologies

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 bring to market new and enhanced technologies and products. Our research and development expenses were $138.8 million for the fiscal year ended October 1, 2021. 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 help support 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 generate an inadequate return on investment, if any, or may take longer than we anticipate to generate a return. For example, we have in the past and may continue to experience additional and new unexpected difficulties, expenses or delays in qualifying and completing certain of our development projects including our GaN-on-Silicon, Silicon Photonics, certain Laser products and our AFRL related process technology transfer. These development risks may be associated with internal MACOM capabilities and/or external factors, which may include, but not limited to, matters with one or more third party foundries, assembly and test suppliers, qualifying related products with our customers and marketing efforts, and we may not be successful in process or product qualification and/or manufacturing cost reductions. In addition, we 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 may not be successful in our research and development efforts or may not realize the competitive advantages, revenues or profits we anticipate from 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.

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. 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. 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.

Certain 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. 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 which could result in substantial unanticipated costs or 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 expect to increase our use of outsourced manufacturing in the future as a strategy. 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. These vendors may 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 we may be liable for resulting damages and expense incurred by our customers.

We utilize sole source suppliers for certain semiconductor packages and other materials and, in some cases, 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 customers' production schedules, which could harm our business. The loss of a supplier can also significantly harm our business and operating results.

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. 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. While we enter into confidentiality agreements with employees and other parties to protect this information, 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.

Risks Relating to Government Regulations

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 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 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 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 or regulations are implemented or if existing trade agreements are renegotiated such changes could have an adverse effect on our business, financial condition and 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.

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. Any change in export or import regulations or related legislation (or the interpretation thereof), shift in approach by regulators to the enforcement or scope of existing regulations, 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 disrupt our markets or otherwise bring liability on us.

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 October 1, 2021, we had $855.8 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 2038, 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.

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 which 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. 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. 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.

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. 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 could cause this loss accrual to prove inadequate, and 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 on Restriction of Hazardous Substances ("RoHS"). 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. 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.

Environmental, social and governance responsibility regulations, policies and provisions, as well as customer and investor demands, may make our supply chain more complex and may adversely affect our relationships with customers and investors.

There is an increasing focus on corporate environmental, social and governance ("ESG") responsibility in the semiconductor industry, particularly with OEMs that manufacture consumer electronics. A number of our customers have adopted, or may adopt, procurement policies that include ESG provisions or requirements that their suppliers should comply with, or they may seek to include such provisions or requirements in their procurement terms and conditions. An increasing number of investors are also requiring companies to disclose corporate ESG policies, practices and metrics. Legal and regulatory requirements, as well as investor expectations, on corporate ESG practices and disclosure, are subject to change, can be unpredictable, and may be difficult and expensive for us to comply with, given the complexity of our supply chain and manufacturing. If we are unable to comply, or are unable to cause our suppliers or contract manufacturers to comply, with such policies or provisions or meet the requirements of our customers and our investors, a customer may stop purchasing products from us or an investor may sell their shares, and may take legal action against us, which could harm our reputation, revenue and results of operations.

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. 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. 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 SEC rules and executive orders. If we cannot satisfy such customers, they may choose a competitor's products or 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.

Failure to comply with data privacy regimes could subject us to significant expenses, litigation and reputational harm.

In the ordinary course of our business, we have access to sensitive, confidential or personal data or information regarding our employees and others that is subject to privacy and security laws and regulations. The theft, loss, or misuse of personal data collected, used, stored or transferred by us, or by our third-party service providers, could result in damage to our reputation, disruption of our business activities, significantly increased business costs or costs related to defending legal claims or regulatory actions.

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. For example, the General Data Protection Regulation ("GDPR") became effective in the European Union on May 25, 2018,and requires compliance with rules regarding the handling of personal data, and California enacted the California Consumer Privacy Act ("CCPA") as of January 1, 2020, which enhances privacy rights and consumer protection for residents of California. It is costly to comply with the GDPR, CCPA and other similar laws and regulations. Further, the GDPR provides for significant penalties in the case of non-compliance of up to €20 million or 4% of worldwide annual revenues, whichever is greater. We have invested, and continue to invest, human and technology resources into our data privacy compliance efforts. 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 applicable data privacy regimes.

Risks Relating to Business Strategies and Personnel

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, our significant competitors include, among others, NXP, Marvell, Maxlinear, Broadcom, Semtech, ADI, Wolfspeed, 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. 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 OEMs, 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. Consolidation among our competitors 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. Our failure to successfully compete could result in lower revenue, decreased profitability and a lower stock price.

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. 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 and the potential delay or failure to realize the perceived strategic or financial merits of the divestment.

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. 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 particular, 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. 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.

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. 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 35.0% of our revenue for the fiscal year ended October 1, 2021, and sales to one of our distributors, Richardson, accounted for 10.7% 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.

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

We routinely evaluate potential acquisitions, investments, joint ventures 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, we may face intense competition for such opportunities. In the event we pursue a potential transaction, we will face numerous risks, including diverting management's attention from normal daily operations of our business; difficulties in integrating the financial reporting capabilities and operating systems of any acquired operations to maintain effective internal control over financial reporting and disclosure controls and procedures; potential loss of key personnel of the acquired company as well as their know-how, relationships and expertise; challenges successfully integrating acquired personnel, operations and businesses; failing to realize the anticipated synergies and benefits of an acquisition; maintaining favorable business relationships of acquired operations; generating insufficient revenue from completed transactions to offset expenses associated with our efforts; acquiring material or unknown liabilities associated with any acquired operations; litigation associated with merger and acquisition transactions; and increasing expense associated with amortization or depreciation of intangible and tangible assets we acquire.

Past transactions, whether completed or abandoned by us, have resulted, and in the future may result, in significant time and attention, 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. 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 the event we make future investments, the investments may decline in value, we may lose all or part of our investment.

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 maintaining access to sufficient manufacturing capacity to meet customer demands; securing sufficient supply of raw materials and services to avoid shortages or supply bottlenecks; adequately building out our administrative infrastructure 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; 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 and workforce, establishing certain operations closer in location to our global customers and evaluating functions that may be more efficiently performed through outsourcing arrangements. For example, in June 2019, we committed to a restructuring plan designed to streamline and improve our operations that included the refocusing of certain research and development activities and a reduction in workforce. Any restructuring initiatives could result in potential adverse effects on employee capabilities, our continued ability to recruit, hire, retain and motivate highly-skilled engineering, operations, sales, administrative, 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 involve large expenditures. For example, in fiscal year 2019, we incurred restructuring charges of $19.5 million, 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 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 a restructuring initiative could harm our results of operations and reduce the price of our common stock.

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, political, industry and market conditions; general market price and volume fluctuations, including volatility resulting from the COVID-19 pandemic; 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, lack of research and reports by industry analysts or negative research and reports by industry analysts; 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; 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%. 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 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 October 1, 2021, John and Susan Ocampo beneficially owned 26.6% 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.

Risks Relating to our 2026 Convertible Notes

Servicing our debt, including the 2026 Convertible Notes, requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our indebtedness.

Our ability to make payments of the principal of, to pay interest on, or to refinance, the 2026 Convertible Notes, or to make cash payments in connection with any conversion of the 2026 Convertible Notes depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not continue to generate cash flow from operations in the future sufficient to service the 2026 Convertible Notes or other indebtedness and make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring indebtedness or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance the 2026 Convertible Notes or our other indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

Provisions in indenture governing the 2026 Convertible Notes may delay or prevent an otherwise beneficial business combination.

The terms of the 2026 Convertible Notes require us to repurchase the 2026 Convertible Notes in the event of a “fundamental change” as defined under the indenture governing the 2026 Convertible Notes. A fundamental change of our Company would trigger an option of the holders of the 2026 Convertible Notes to require us to repurchase the 2026 Convertible Notes. In addition, if a make-whole fundamental change occurs prior to the maturity date of the 2026 Convertible Notes, we will in some cases be required to increase the conversion rate for a holder that elects to convert its 2026 Convertible Notes. Furthermore, the indenture that governs the 2026 Convertible Notes prohibits us from engaging in certain mergers or acquisitions unless, among other things, the surviving entity assumes our obligations under the 2026 Convertible Notes. This may have the effect of delaying or preventing an acquisition of our Company that could be beneficial to investors.

We may not have the ability to raise the funds necessary to settle conversions of the 2026 Convertible Notes in cash or to repurchase the 2026 Convertible Notes upon a fundamental change and our debt may limit our ability to pay cash upon conversion or repurchase of the 2026 Convertible Notes.

Holders of the 2026 Convertible Notes have the right to require us to repurchase their 2026 Convertible Notes upon the occurrence of a fundamental change at a purchase price equal to 100% of the principal amount of the 2026 Convertible Notes to be repurchased, plus accrued and unpaid interest, if any, to, but not including, the fundamental change repurchase date. In addition, unless we elect to deliver solely shares of our common stock upon conversion, we will be required to make cash payments in respect of the 2026 Convertible Notes being converted. However, we may not have enough available cash or be able to obtain financing at the time we are required to make purchases of the 2026 Convertible Notes, and our failure to do so would constitute a default under the indenture governing the 2026 Convertible Notes. In addition, our ability to repurchase the 2026 Convertible Notes or to pay cash upon conversion of the 2026 Convertible Notes could be limited by law, by regulatory authority or by agreements that will govern our future indebtedness. A default under the indenture governing the 2026 Convertible Notes or the fundamental change itself could also lead to a default under agreements governing our existing or future indebtedness.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 2. PROPERTIES.

Our principal executive offices are located in a leased facility in Lowell, Massachusetts. 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, S&M and RT	281,700	October 2038
Santa Clara, California	R&D, AE and S&M	46,270	October 2024
Newport Beach, California	R&D, AE and S&M	57,412	December 2029
Ann Arbor, Michigan	P&F, R&D and T&A, RT	50,335	May 2026
Nashua, New Hampshire	R&D, T&A, P&F and RT	33,750	December 2024
Cork, Ireland	A, R&D, S&M, AE and RT	21,422	August 2026

(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 and equipment by geographic region for each of the last two fiscal years and additional information on all of our lease obligations, 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 litigation. 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 15 - 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.

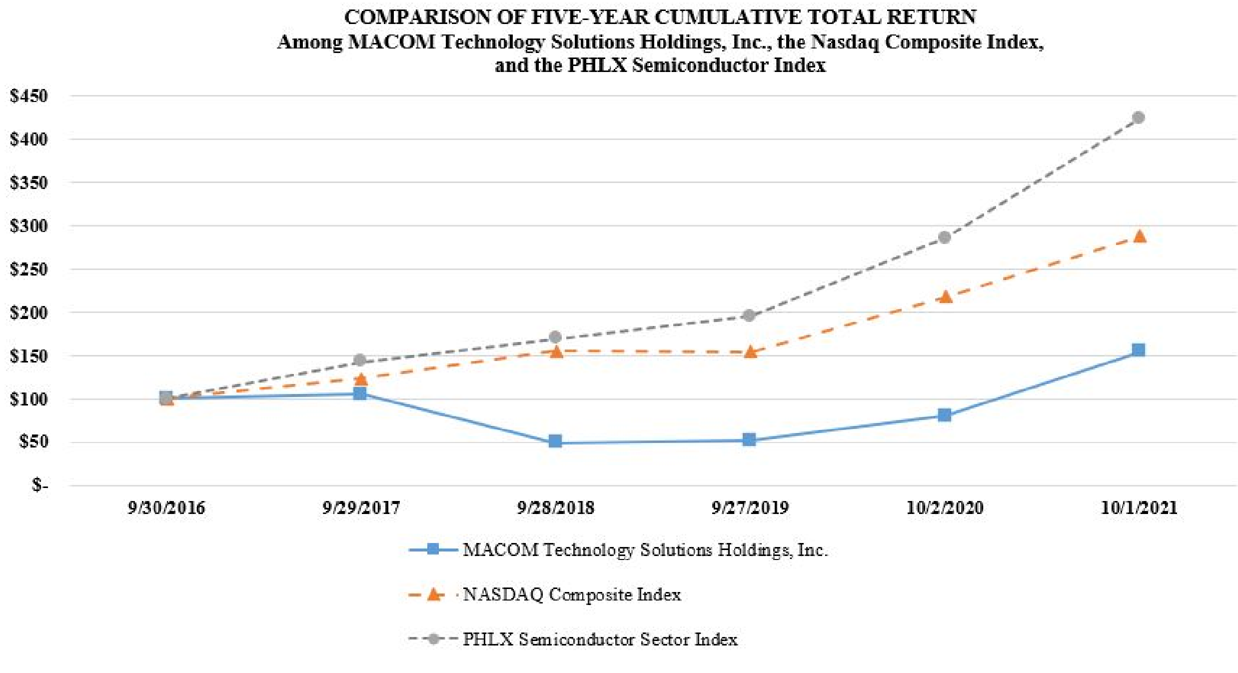
PART II

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 11, 2021 was approximately 75. 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 September 30, 2016 through October 1, 2021 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 $42.34 on September 30, 2016 and in the Nasdaq Composite Index and the PHLX Semiconductor Index on the closest month end date of September 30, 2016, 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.



	September 30, 2016	September 29, 2017	September 28, 2018	September 27, 2019	October 2, 2020	October 1, 2021
MACOM Technology Solutions Holdings, Inc.	$100.00	$105.36	$48.65	$51.20	$79.83	$154.32
Nasdaq Composite Index	$100.00	$123.68	$154.82	$154.46	$217.58	$288.09
PHLX Semiconductor Index	$100.00	$142.61	$169.26	$194.96	$285.67	$424.70

Issuer Purchases of Equity Securities

The following table presents information with respect to purchases of common stock we made during the fiscal quarter ended October 1, 2021.

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
July 3, 2021—July 30, 2021	57	$ 58.20	—	—
July 31, 2021—August 27, 2021	234	61.11	—	—
August 28, 2021—October 1, 2021	243	63.10	—	—
Total	534	$ 61.70	—	—

(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. [RESERVED]

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 Telecom, I&D and Data Center applications. Headquartered in Lowell, Massachusetts, we have more than 70 years of application expertise, with silicon, GaAs and InP 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 ICs, MCMs, diodes, amplifiers, switches and switch limiters, passive and active components and complete subsystems, across dozens of product lines serving over 6,000 end customers in three primary markets. Our semiconductor products are electronic components that our customers generally incorporate into 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 such as long-haul/metro, 5G and FTTx/PON, among others; (2) 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; and (3) Data Center, enabled by our broad portfolio of analog ICs and photonic components for high speed optical module customers.

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. Fiscal years 2021 and 2019 each consisted of 52 weeks, and fiscal year 2020 included 53 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. Our first quarter of fiscal year 2020, ended January 3, 2020, included 14 weeks.

Description of Our Revenue

Revenue. Our revenue is derived from sales of high-performance RF, microwave, millimeter wave, optical and photonic semiconductor products. We design, integrate, manufacture and package differentiated, semiconductor-based products that we sell to customers through our direct sales organization, our network of independent sales representatives and our distributors. We believe the primary drivers of our future revenue growth will include:

- continued growth in the demand for high-performance analog, digital and optical semiconductors in our three primary markets;
- introducing new products using advanced technologies, added features, higher levels of integration and improved performance;
- increasing content of our semiconductor solutions in customers' systems through cross-selling our product lines;
- leveraging our core strength and leadership position in standard, catalog products that service all of our end applications; and
- engaging early with our lead customers to develop custom and standard products.

Our core strategy is to develop and innovate high-performance products that address our customers' most difficult technical challenges in our primary markets: Telecom, I&D and Data Center.

We expect our revenue in the Telecom market to be driven by 5G deployments, with continued upgrades and expansion of communications equipment, and increasing adoption of our high-performance RF, millimeter wave, optical and photonic components.

We expect our revenue in the I&D market to be driven by the expanding product portfolio that we offer which services applications such as test and measurement, satellite communications, civil and military radar, industrial, scientific and medical applications, further supported by growth in applications for our multi-market catalog products.

We expect our revenue in the Data Center market to be driven by the adoption of cloud-based services and the upgrade of data center architectures, to 100G, 200G, 400G and 800G interconnects, which we expect will drive adoption of higher speed optical and photonic components.

COVID-19 Impact

See "*Item 1 - Business*." For additional information on risk factors that could impact our future results, please refer to "*Item 1A - Risk Factors*" in this Annual Report.

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 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.

Due to the COVID-19 pandemic, there has been uncertainty and disruption in the global economy and financial markets. We are not aware of any specific event or circumstance that would require updates to our estimates or judgments or require us to revise the carrying value of our assets or liabilities as of the date of filing of this Annual Report on Form 10-K with the SEC. These estimates may change as new events occur and additional information is obtained. Actual results could differ materially from these estimates under different assumptions or conditions.

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 long-lived asset valuations and associated impairment assessments; revenue 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.

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 and the value of our long-lived asset groups could be adversely affected by, but not limited to, a change in strategy, the outcome of development activities, a significant slowdown in our primary markets, the semiconductor industry or worldwide economy, or a decline in the valuation of technology company stocks, including the valuation of our common stock.

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 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 provide 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

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

	Fiscal Years 2021	Fiscal Years 2020	Fiscal Years 2019
Revenue	$ 606,920	$ 530,037	$ 499,708
Cost of revenue [1]	265,065	259,871	279,000
Gross profit	341,855	270,166	220,708
Operating expenses:			
Research and development [1]	138,844	141,333	163,469
Selling, general and administrative [1]	122,009	124,306	153,286
Impairment charges [2]	—	—	264,786
Restructuring charges [3]	—	1,139	19,543
Total operating expenses	260,853	266,778	601,084
Income (loss) from operations	81,002	3,388	(380,376)
Other (expense) income:			
Warrant liability (expense) gain [4]	(11,130)	(12,948)	765
Interest expense	(20,593)	(27,380)	(35,803)
Other expense, net [5]	(6,334)	(4,622)	(7,739)
Other expense, net	(38,057)	(44,950)	(42,777)
Income (loss) before income taxes	42,945	(41,562)	(423,153)
Income tax expense (benefit)	4,972	4,516	(39,355)
Net income (loss)	$ 37,973	$ (46,078)	$ (383,798)

(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 2021	Fiscal Years 2020	Fiscal Years 2019
(a) Intangible amortization expense:			
Cost of revenue	$ 15,296	$ 17,462	$ 29,847
Selling, general and administrative	30,917	32,868	44,872
Total intangible amortization expense	$ 46,213	$ 50,330	$ 74,719
(b) Share-based compensation expense:			
Cost of revenue	$ 3,298	$ 3,609	$ 2,936
Research and development	13,332	12,794	8,551
Selling, general and administrative	18,368	19,271	12,305
Total share-based compensation expense	$ 34,998	$ 35,674	$ 23,792

(2) Impairment charges in fiscal year 2019 include $264.8 million for impairment of customer relationship and acquired technology intangible assets as well as equipment. See *Note 10 - Impairments* to the Consolidated Financial Statements included in this Annual Report for additional information.

(3) See *Note 12 - Restructurings*, to the Consolidated Financial Statements included in this Annual Report for additional information.

(4) Represents changes in the fair value of common stock warrants recorded as liabilities and adjusted each reporting period to fair value. See *Note 19 - Stockholders' Equity* to the Consolidated Financial Statements included in this Annual Report for additional information regarding the common stock warrants.

(5) Includes $2.4 million, $3.4 million and $7.5 million of non-cash net losses for fiscal years 2021, 2020 and 2019, respectively, associated with our equity method investment in Ampere based on our proportionate share of the losses and changes in equity of Ampere. The net loss amounts for fiscal years 2021, 2020 and 2019 include non-cash gains of $9.8 million and $16.6 million and $10.8 million, respectively, associated with changes in Ampere’s equity. See *Note 4 - Investments* to the Consolidated Financial Statements included in this Annual Report for additional information. Fiscal year 2021 also includes losses on extinguishment of debt of $4.4 million. See *Note 16 - Debt* 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		
	2021	2020	2019
Revenue	100.0 %	100.0 %	100.0 %
Cost of revenue	43.7	49.0	55.8
Gross profit	56.3	51.0	44.2
Operating expenses:			
Research and development	22.9	26.7	32.7
Selling, general and administrative	20.1	23.5	30.7
Impairment charges	—	—	53.0
Restructuring charges	—	0.2	3.9
Total operating expenses	43.0	50.3	120.3
Income (loss) from operations	13.3	0.6	(76.1)
Other (expense) income:			
Warrant liability (expense) gain	(1.8)	(2.4)	0.2
Interest expense, net	(3.4)	(5.2)	(7.2)
Other expense, net	(1.0)	(0.9)	(1.5)
Total other expense, net	(6.3)	(8.5)	(8.6)
Income (loss) before income taxes	7.1	(7.8)	(84.7)
Income tax expense (benefit)	0.8	0.9	(7.9)
Net income (loss)	6.3 %	(8.7)%	(76.8)%

Comparison of Fiscal Year Ended October 1, 2021 to Fiscal Year Ended October 2, 2020

Revenue. In fiscal year 2021, our revenue increased by $76.9 million, or 14.5%, to $606.9 million from $530.0 million for fiscal year 2020. Fiscal year 2021 consisted of 52 weeks, and fiscal year 2020 included 53 weeks.

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		
	2021	2020	% Change
Telecom	$ 188,391	$ 209,477	(10.1)%
Industrial & Defense	280,221	194,506	44.1 %
Data Center	138,308	126,054	9.8 %
Total	$ 606,920	$ 530,037	14.5 %
Telecom	31.0 %	39.5 %	
Industrial & Defense	46.2 %	36.7 %	
Data Center	22.8 %	23.8 %	
Total	100.0 %	100.0 %	

In fiscal year 2021, our Telecom market revenue decreased by $21.1 million, or 10.1%, compared to fiscal year 2020. The decrease was primarily driven by a decrease in carrier-based optical semiconductor products, including those targeted for 5G applications, offset by increased sales of legacy products, including products targeting fiber to the home, CATV infrastructure and licensing revenue.

In fiscal year 2021, our I&D market revenue increased by $85.7 million, or 44.1%, compared to fiscal year 2020. The increase was primarily related to new program wins and expansion of our RF and microwave product lines.

In fiscal year 2021, our Data Center market revenue increased by $12.3 million, or 9.8%, compared to fiscal year 2020. The increase was primarily due to increased sales of our high-performance analog and optoelectronics Data Center products.

Gross profit. In fiscal year 2021, our gross profit increased by $71.7 million, or 26.5%, compared to fiscal year 2020. Gross margin of 56.3% in fiscal year 2021 increased 530 basis points, compared to fiscal year 2020. The increase in gross profit during 2021 was primarily the result of higher sales, favorable revenue mix, production efficiencies, as well as decreases in depreciation and amortization.

Research and development. In fiscal year 2021, research and development expense decreased by $2.5 million, or 1.8%, to $138.8 million representing 22.9% of revenue, compared with $141.3 million, representing 26.7% of revenue in fiscal year 2020. Research and development expense decreased during fiscal year 2021 primarily as a result of decreased spending on software and lower depreciation, partially offset by higher supplies expense, foundry costs and outside service costs.

Selling, general and administrative. In fiscal year 2021, selling, general and administrative expenses decreased by $2.3 million, or 1.8%, to $122.0 million, or 20.1% of revenue, compared with $124.3 million, or 23.5% of revenue, for fiscal year 2020. Selling, general and administrative expenses decreased during fiscal year 2021 primarily due to lower depreciation, amortization and other outside service costs, offset by an increase in variable selling costs.

Restructuring charges. There were no restructuring charges incurred during fiscal year 2021, compared with $1.1 million, or 0.2% of our revenue, for fiscal year 2020. All restructuring actions were completed as of October 2, 2020. Refer to *Note 12 - Restructurings* in this Annual Report on Form 10-K for additional information.

Warrant liability gain. In fiscal year 2021, we recorded warrant expense of $11.1 million, or 1.8% of revenue, compared to an expense of $12.9 million, or 2.4% of revenue, for fiscal year 2020. The difference between periods was driven by a change in the estimated fair value of common stock warrants, primarily driven by the increase in the underlying price of our common stock, which was recorded as a liability at fair value. During November 2020, all of the warrants were exercised and 857,631 shares of common stock were issued. As of October 1, 2021, there are no remaining common stock warrants outstanding. See *Note 19 - Stockholders' Equity* in this Annual Report for additional information regarding the common stock warrants.

Interest expense, net. In fiscal year 2021, interest expense, net was $20.6 million, or 3.4% of our revenue, compared to $27.4 million, or 5.2% of our revenue, for fiscal year 2020. The decrease in fiscal year 2021 is primarily due to a lower effective interest rate on our Term Loans and the decrease in our long-term debt balance.

*Provision f*or *income taxes*. In fiscal year 2021, income tax expense was $5.0 million, or 0.8% of revenue, compared to an expense of $4.5 million, or 0.9% of revenue, for fiscal year 2020. The change in the provision is primarily due to a change in the valuation allowance.

The difference between the U.S. federal income tax rate of 21% and our effective income tax rate of 11.6% for fiscal year 2021 was primarily driven by the continuation of a full valuation allowance against any tax expense associated with U.S. income and income taxed in foreign jurisdictions at generally lower tax rates. For fiscal year 2020, our effective income tax rate of (10.9)% was primarily impacted by the continuation of a full valuation allowance against any benefit associated with U.S. losses and income taxed in foreign jurisdictions at generally lower tax rates.

Comparison of Fiscal Year Ended October 2, 2020 to Fiscal Year Ended September 27, 2019

Revenue. In fiscal year 2020, our revenue increased by $30.3 million, or 6.1%, to $530.0 million from $499.7 million for fiscal year 2019. Fiscal year 2020 included 53 weeks and fiscal year 2019 consisted of 52 weeks. Our first quarter of fiscal year 2020, ended January 3, 2020, included 14 weeks.

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		
	2020	2019	% Change
Telecom	$ 209,477	$ 180,938	15.8 %
Industrial & Defense	194,506	204,638	(5.0)%
Data Center	126,054	114,132	10.4 %
Total	530,037	499,708	6.1 %
Telecom	39.5 %	36.2 %	
Industrial & Defense	36.7 %	41.0 %	
Data Center	23.8 %	22.8 %	
Total	100.0 %	100.0 %	

In fiscal year 2020, our Telecom market revenue increased by $28.5 million, or 15.8%, compared to fiscal year 2019. The increase was primarily driven by increased sales of carrier-based optical semiconductor products, including those targeted for 5G applications, primarily to our Asia customer base, partially offset by lower sales of legacy products.

In fiscal year 2020, our I&D market revenue decreased by $10.1 million, or 5.0%, compared to fiscal year 2019. The decrease was primarily related to the decline in certain defense-related programs and lower sales of certain legacy product lines.

In fiscal year 2020, our Data Center market revenue increased by $11.9 million, or 10.4%, compared to fiscal year 2019. The increase was primarily due to increased sales of our high-performance analog Data Center products.

Gross profit. In fiscal year 2020, our gross profit increased by $49.5 million, or 22.4%, compared to fiscal year 2019. Gross margin of 51.0% in fiscal year 2020 increased 680 basis points, compared to fiscal year 2019. The increase in gross profit during 2020 was primarily the result of lower inventory reserve expenses and the strategic realignment of our business under the 2019 Plan (as defined below), resulting in lower compensation-related costs and intangible amortization.

Research and development. In fiscal year 2020, research and development expense decreased by $22.1 million, or 13.5%, to $141.3 million representing 26.7% of revenue, compared with $163.5 million, representing 32.7% of revenue in fiscal year 2019. Research and development expense decreased during fiscal year 2020 primarily as a result of the strategic realignment of our business and operations under the 2019 Plan, resulting in lower compensation and research and development related costs, partially offset by higher share-based compensation expense.

Selling, general and administrative. In fiscal year 2020, selling, general and administrative expenses decreased by $29.0 million, or 18.9%, to $124.3 million, or 23.5% of revenue, compared with $153.3 million, or 30.7% of revenue, for fiscal year 2019. Selling, general and administrative expenses decreased during fiscal year 2020 primarily due to lower intangible amortization expense, decreased discretionary spending, such as external services and travel, offset by an increase in share-based compensation expense.

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 of equipment from construction in process that was not placed in service. See *Note 10 - Impairments* to the Consolidated Financial Statements included in this Annual Report for additional information.

Restructuring charges. In fiscal year 2020, restructuring charges were $1.1 million, or 0.2% of our revenue, compared with $19.5 million, or 3.9% of our revenue, for fiscal year 2019. In fiscal year 2019, restructuring charges primarily related to the 2019 Plan and the Ithaca Plan, each as defined below.

During the third quarter of fiscal 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 multiple development facilities, reducing certain development activities for one of our product lines and no longer investing in the design and development of optical modules and subsystems for Data Center applications (the “2019 Plan”). During the fiscal year ended October 2, 2020, we incurred restructuring expenses of $1.2 million under the 2019 Plan, including $0.8 million of facility-related costs and $0.4 million of employee-related costs. We incurred restructuring charges of $11.6 million in fiscal year 2019, 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. This action was completed during fiscal 2020 and the remaining charges were paid during fiscal year 2021.

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 (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 completed in fiscal year 2019 and no further costs were incurred.

Refer to *Note 12 - Restructurings* in this Annual Report on Form 10-K for additional information.

Warrant liability gain. In fiscal year 2020, we recorded warrant expense of $12.9 million, or 2.4% of revenue, compared to a gain of $0.8 million, or 0.2% of revenue, for fiscal year 2019. The difference between periods was driven by an increase in the estimated fair value of common stock warrants we issued in December 2010, which we carry as a liability at fair value. Substantially all of the warrants were exercised and common stock was issued on November 11, 2020. See *Note 19 - Stockholders' Equity* in this Annual Report for additional information regarding the common stock warrants.

Provision for income taxes. In fiscal year 2020, income tax expense was $4.5 million, or 0.9% of revenue, compared to a benefit of $39.4 million, or 7.9% of revenue, for fiscal year 2019. The change in the provision is primarily due to recognition of current and deferred income tax effects totaling $39.8 million during fiscal year 2019, from an intra-entity transfer of a license for intellectual property between foreign tax jurisdictions that received a tax basis step-up, with no similar benefit during fiscal year 2020.

The difference between the U.S. federal income tax rate of 21% and our effective income tax rate of (10.9)% for fiscal year 2020 was primarily driven by the continuation of a full valuation allowance against any benefit associated with U.S. losses and income taxed in foreign jurisdictions at generally lower tax rates. For fiscal year 2019, our effective income tax rate of 9.3% 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.

LIQUIDITY AND CAPITAL RESOURCES

The following table summarizes our cash flow activities for the fiscal years ended October 1, 2021 and October 2, 2020, respectively (in thousands):

	Fiscal Year Ended	
	October 1, 2021	October 2, 2020
Cash and cash equivalents, beginning of period	$ 129,441	$ 75,519
Net cash provided by operating activities	148,412	171,397
Net cash used in investing activities	(2,583)	(107,195)
Net cash used in financing activities	(119,095)	(10,716)
Effect of exchange rates on cash balances	362	436
Cash and cash equivalents, end of period	$ 156,537	$ 129,441

Cash Flow from Operating Activities:

Our cash flow from operating activities for fiscal year 2021 was $148.4 million and consisted of a net income of $38.0 million, plus adjustments to reconcile our net income to cash provided by operating activities of $136.4 million, partially offset by changes in operating assets and liabilities of $25.9 million. Adjustments to reconcile our net income to cash provided by operating activities of $136.4 million primarily included depreciation and intangible amortization expense of $70.0 million, share-based compensation expense of $35.0 million, warrant liability expense of $11.1 million, accretion of the discount on convertible debt of $7.6 million and deferred financing cost amortization and write offs of $6.5 million. In addition, cash used by operating assets and liabilities was $25.9 million for fiscal year 2021, primarily driven by an increase in accounts receivable of $38.7 million due to timing of sales, partially offset by a decrease in inventory of $8.9 million and an increase in accounts payable of $5.8 million.

Our cash flow from operating activities for fiscal year 2020 was $171.4 million and consisted of a net loss of $46.1 million, plus adjustments to reconcile our net loss to cash provided by operating activities of $142.1 million plus changes in operating assets and liabilities of $75.5 million. Adjustments to reconcile our net loss to cash provided by operating activities of $142.1 million primarily included depreciation and intangible amortization expense of $78.8 million, share-based compensation expense of $35.7 million, warrant liability expense of $12.9 million, impairment and net loss on minority equity investments of $5.9 million, amortization of deferred financing costs of $4.1 million and a decrease in deferred tax assets of $3.3 million. In addition, cash from operating assets and liabilities was $75.5 million for fiscal year 2020, primarily driven by a decrease in accounts receivable of $23.9 million due to improved revenue linearity, a decrease in inventory of $16.3 million, a decrease in income tax receivable of $14.9 million and a decrease in prepaid expenses and other assets of $18.1 million.

Cash Flow from Investing Activities:

Our cash flow used in investing activities for fiscal year 2021 consisted primarily of $194.2 million in purchases of short-term investments and capital expenditures of $18.0 million, partially offset by proceeds of $209.3 million related to the sale and maturities of short-term investments.

Our cash flow used in investing activities for fiscal year 2020 consisted primarily of $284.9 million in purchases of short-term investments, proceeds of $183.9 million related to the sale and maturities of short-term investments, capital expenditures of $17.6 million and proceeds of $11.0 million associated with our divestment in May 2018 of certain capital equipment, inventory and other assets in Japan associated with the LR4 business.

Cash Flow from Financing Activities:

During fiscal year 2021, our cash used in financing activities of $119.1 million was primarily related to $545.3 million of prepayments on our Term Loans (as defined in *Note 16 - Debt* to our Consolidated Financial Statements included in this Annual Report) and $23.4 million of repurchases of stock associated with employee tax withholdings on vested equity awards, partially offset by proceeds of $450.0 million from the 2026 Convertible Notes (as defined in *Note 16 - Debt* to our Consolidated Financial Statements included in this Annual Report) and $6.8 million of proceeds from stock option exercises and employee stock purchases. The early prepayment on the Term Loans of $543.6 million was made using $443.6 million of net proceeds from our 2026 Convertible Notes and cash of $100.0 million. See *Note 16 - Debt* to our Consolidated Financial Statements included in this Annual Report for additional information.

During fiscal year 2020, our cash used in financing activities of $10.7 million was primarily related to $6.9 million of principal payments associated with our Term Loans (as defined in *Note 16 - Debt* to our Consolidated Financial Statements included in this Annual Report) and $6.7 million in purchases of stock associated with employee tax withholdings, partially offset by $4.6 million of proceeds from stock option exercises and employee stock purchases.

Liquidity

As of October 1, 2021, we held $156.5 million of cash and cash equivalents, primarily deposited with financial institutions as well as $188.4 million of liquid short-term investments. The undistributed earnings of certain foreign subsidiaries are considered indefinitely reinvested for the periods presented and we do not intend to repatriate such earnings. We believe the decision to reinvest these earnings will not have a significant impact on our liquidity. As of October 1, 2021, cash held by our indefinitely reinvested foreign subsidiaries was $27.1 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 October 1, 2021, we had $160.0 million in borrowing capacity under our Revolving Facility (as defined in *Note 16 - Debt* to our Consolidated Financial Statements included in this Annual Report) that expired undrawn on November 8, 2021.

We plan to use our remaining available cash and cash equivalents as well as our short-term investments 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 and cash generated from operations 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 do so on favorable terms or at all.

As of October 1, 2021, we had no off-balance sheet arrangements.

CONTRACTUAL OBLIGATIONS

The following is a summary of our contractual payment obligations for consolidated debt, purchase agreements, leases, financing obligations, other commitments and long-term liabilities as of October 1, 2021 (in thousands):

	Payments Due By Period				
Contractual Cash Obligations	**Total**	**Less Than 1 Year**	**1-3 Years**	**3-5 Years**	**More Than 5 Years**
Principal Payments on Long-term Debt (1)	$ 570,766	$ —	$ 120,766	$ 450,000	$ —
Interest Payments on Long-term Debt (1)	12,574	3,999	6,866	1,709	—
Finance Lease Obligations (2)	48,446	2,836	5,675	5,463	34,472
Operating Lease Obligations (2)	43,069	9,353	14,639	8,630	10,447
Purchase Commitments (3)	135,184	103,291	9,548	3,427	18,918
Total Contractual Cash Obligations	$ 810,039	$ 119,479	$ 157,494	$ 469,229	$ 63,837

(1) Our Term Loans will mature in May 2024 and our 2026 Convertible Notes will mature in March 2026. The interest rate on the Term Loans is variable, which may result in changes to our interest obligations. See *Note 16 - Deb*t to the Consolidated Financial Statements included in this Annual Report for additional information.

(2) Estimated future lease payments, see *Note 18 - Leases* to the Consolidated Financial Statements included in this Annual Report for additional information.

(3) We have purchase commitments of $108.0 million primarily related to services and inventory supply arrangements of which approximately $82.7 million that is non-cancelable. In addition, we have $27.2 million in fixed payments associated with a power purchase agreement that is expected to commence in fiscal 2022 and has a 15-year term. See *Note 17- Financing Obligation* for additional detail on the power purchase agreement.

As of October 1, 2021, we estimated $1.9 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 change materially in the next twelve months, we are presently unable to reliably estimate when any cash settlement of these obligations may occur.

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.

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 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 October 1, 2021, we had $120.8 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 $1.2 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. Changes 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, reduce or delay customer orders, or otherwise negatively affect how customers 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.

INDEX TO FINANCIAL STATEMENTS

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 October 1, 2021 and October 2, 2020, and the related consolidated statements of operations, comprehensive income (loss), stockholders' equity, and cash flows, for each of the three years in the period ended October 1, 2021, 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 October 1, 2021 and October 2, 2020, and the results of its operations and its cash flows for each of the three years in the period ended October 1, 2021, 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 October 1, 2021, 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 15, 2021, 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 Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates 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 matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Inventories – Excess Quantities and Obsolescence — Refer to Notes 2 and 7 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 October 1, 2021, the Company has inventories of $82.7 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 and historical consumption of the part including future sales plans, product life cycle, and utilization in other products. For each selected part we tested the calculation of the excess and obsolete reserve pursuant to the Company's policy.

- We held discussions with senior financial and operations management to determine that any strategic, regulatory, or operational changes in the business were consistent with the projections of future demand that were utilized as the basis for the reserves recorded.

- We performed a retrospective review by comparing management's prior year projections of future demand by product with actual product sales in the current year to identify potential bias in the inventory reserve.

- We compared the Company's inventory reserve assumptions to events and trends discussed in industry and analyst reports, disclosed in 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.

/s/ Deloitte & Touche LLP

Boston, Massachusetts

November 15, 2021

We have served as the Company's auditor since 2010

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

	October 1, 2021	October 2, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	$ 156,537	$ 129,441
Short-term investments	188,365	203,711
Accounts receivable, net	84,570	45,884
Inventories	82,699	91,584
Prepaid and other current assets	9,365	10,899
Total current assets	521,536	481,519
Property and equipment, net	120,526	118,866
Goodwill	314,240	315,012
Intangible assets, net	84,685	130,898
Deferred income taxes	39,516	41,935
Other investments	15,342	17,745
Other long-term assets	38,300	40,453
Total assets	$ 1,134,145	$ 1,146,428
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of finance lease obligations	$ 958	$ 1,368
Current portion of long-term debt	—	6,885
Accounts payable	28,712	23,043
Accrued liabilities	63,374	63,654
Total current liabilities	93,044	94,950
Finance lease obligations, less current portion	28,037	28,994
Financing obligation	8,720	—
Long-term debt, less current portion	492,097	652,172
Warrant liability	—	25,312
Other long-term liabilities	40,511	44,854
Total liabilities	662,409	846,282
Commitments and contingencies (Note 15)		
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; 68,877 and 66,921 shares issued and 68,854 and 66,898 shares outstanding as of October 1, 2021 and October 2, 2020, respectively	69	67
Treasury Stock, at cost, 23 shares as of both October 1, 2021 and October 2, 2020	(330)	(330)
Accumulated other comprehensive income	4,150	5,009
Additional paid-in capital	1,269,601	1,135,127
Accumulated deficit	(801,754)	(839,727)
Total stockholders' equity	471,736	300,146
Total liabilities and stockholders' equity	$ 1,134,145	$ 1,146,428

See notes to consolidated financial statements.

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

	Fiscal Years		
	2021	**2020**	**2019**
Revenue	$ 606,920	$ 530,037	$ 499,708
Cost of revenue	265,065	259,871	279,000
Gross profit	341,855	270,166	220,708
Operating expenses:			
Research and development	138,844	141,333	163,469
Selling, general and administrative	122,009	124,306	153,286
Impairment charges	—	—	264,786
Restructuring charges	—	1,139	19,543
Total operating expenses	260,853	266,778	601,084
Income (loss) from operations	81,002	3,388	(380,376)
Other (expense) income:			
Warrant liability (expense) gain	(11,130)	(12,948)	765
Interest expense, net	(20,593)	(27,380)	(35,803)
Other expense, net	(6,334)	(4,622)	(7,739)
Total other expense, net	(38,057)	(44,950)	(42,777)
Income (loss) before income taxes	42,945	(41,562)	(423,153)
Income tax expense (benefit)	4,972	4,516	(39,355)
Net income (loss)	$ 37,973	$ (46,078)	$ (383,798)
Net income (loss) per share:			
Income (loss) per share - basic	$ 0.55	$ (0.69)	$ (5.84)
Income (loss) per share - diluted	$ 0.54	$ (0.69)	$ (5.84)
Shares used:			
Basic	68,449	66,606	65,686
Diluted	70,474	66,606	65,686

See notes to consolidated financial statements.

MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(In thousands)

	Fiscal Years		
	2021	**2020**	**2019**
Net income (loss)	$ 37,973	$ (46,078)	$ (383,798)
Unrealized (loss) gain on short-term investments	(198)	193	477
Foreign currency translation (loss) gain, net of tax	(661)	458	1,693
Other comprehensive (loss) income, net of tax	(859)	651	2,170
Total comprehensive income (loss)	$ 37,114	$ (45,427)	$ (381,628)

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 as of 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 as of September 27, 2019	**66,177**	**$ 66**	**(23)**	**$ (330)**	**$ 4,358**	**$1,101,576**	**$ (791,774)**	**$ 313,896**
Cumulative effect of adoption of ASU 2016-02	—	—	—	—	—	—	(1,875)	(1,875)
Stock option exercises	51	—	—	—	—	188	—	188
Vesting of restricted common stock and units	648	1	—	—	—	—	—	1
Issuance of common stock pursuant to employee stock purchase plan	272	—	—	—	—	4,397	—	4,397
Shares repurchased for tax withholdings on restricted stock awards	(227)	—	—	—	—	(6,708)	—	(6,708)
Share-based compensation	—	—	—	—	—	35,674	—	35,674
Other comprehensive income, net of tax	—	—	—	—	651	—	—	651
Net loss	—	—	—	—	—	—	(46,078)	(46,078)
Balance as of October 2, 2020	**66,921**	**$ 67**	**(23)**	**$ (330)**	**$ 5,009**	**$1,135,127**	**$ (839,727)**	**$ 300,146**
Stock option exercises	120	—	—	—	—	1,985	—	1,985
Vesting of restricted common stock and units	1,285	1	—	—	—	—	—	1
Issuance of common stock pursuant to employee stock purchase plan	166	—	—	—	—	4,796	—	4,796
Shares repurchased for tax withholdings on restricted stock awards	(473)	—	—	—	—	(23,436)	—	(23,436)
Share-based compensation	—	—	—	—	—	34,998	—	34,998
Other comprehensive loss, net of tax	—	—	—	—	(859)	—	—	(859)
Issuance of common stock for the cashless exercise of warrants	858	1	—	—	—	36,441	—	36,442
Equity component of convertible notes, net of deferred financing costs	—	—	—	—	—	79,690	—	79,690
Net income	—	—	—	—	—	—	37,973	37,973
Balance as of October 1, 2021	**68,877**	**$ 69**	**(23)**	**$ (330)**	**$ 4,150**	**$1,269,601**	**$ (801,754)**	**$ 471,736**

See notes to consolidated financial statements.

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

	Fiscal Years		
	2021	**2020**	**2019**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income (loss)	$ 37,973	$ (46,078)	$ (383,798)
Adjustments to reconcile net loss to net cash from operating activities:			
Depreciation and intangible amortization	69,953	78,826	104,418
Share-based compensation	34,998	35,674	23,792
Warrant liability expense (gain)	11,130	12,948	(765)
Deferred financing costs amortization and write-offs	6,458	4,061	4,061
Accretion of discount on convertible notes	7,619	—	—
Deferred income taxes	2,520	3,340	(41,297)
Impairment and restructuring related charges	—	—	273,572
Net loss on and impairment of minority equity investments	2,403	5,867	7,481
Other adjustments, net	1,284	1,241	194
Change in operating assets and liabilities:			
Accounts receivable	(38,686)	23,906	27,585
Inventories	8,886	16,296	14,964
Prepaid expenses and other assets	(560)	18,077	3,419
Accounts payable	5,810	(1,603)	(12,220)
Accrued and other liabilities	(1,481)	3,915	(2,486)
Income taxes	105	14,927	1,780
Net cash from operating activities	148,412	171,397	20,700
CASH FLOWS FROM INVESTING ACTIVITIES:			
Purchases of property and equipment	(17,954)	(17,573)	(37,963)
Proceeds from sale of assets	284	419	5,541
Proceeds from sales and maturities of short-term investments	209,306	183,874	173,020
Purchases of short-term investments	(194,219)	(284,918)	(174,114)
Proceeds from divested business	—	11,003	—
Acquisition of businesses, net	—	—	(375)
Net cash used in investing activities	(2,583)	(107,195)	(33,891)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from convertible notes	450,000	—	—
Payment of issuance costs in connection with convertible notes	(5,751)	—	—
Payments on long-term debt	(545,321)	(6,885)	(6,885)
Payments for finance leases and other	(1,368)	(1,708)	(1,421)
Proceeds from stock option exercises and employee stock purchases	6,781	4,585	7,193
Repurchase of common stock for tax withholdings on equity awards	(23,436)	(6,708)	(4,137)
Other adjustments, net	—	—	(578)
Net cash used in financing activities	(119,095)	(10,716)	(5,828)
Foreign currency effect on cash	362	436	(138)
NET CHANGE IN CASH AND CASH EQUIVALENTS	27,096	53,922	(19,157)
CASH AND CASH EQUIVALENTS — Beginning of year	129,441	75,519	94,676
CASH AND CASH EQUIVALENTS — End of year	$ 156,537	$ 129,441	$ 75,519

Supplemental disclosure of non-cash activities (See *Note 24 - Supplemental Cash Flow Information*)

See 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, millimeter wave 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 operating segment that designs, develops, manufactures and markets 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. In the Consolidated Balance Sheets and Notes Consolidated Financial Statements, certain prior year balances have been reclassified to conform to the current year presentation.

We have a 52- or 53-week fiscal year ending on the Friday closest to the last day of September. Fiscal years 2021 and 2019 included 52 weeks, and fiscal year 2020 included 53 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. Our first quarter of fiscal year 2020, ended January 3, 2020, included 14 weeks.

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.

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 at period end. Unrealized gains and losses that are deemed to be unrelated to credit losses are recorded in accumulated other comprehensive income and loss as a separate component of stockholders' equity.

A decline in the fair value of any debt security below cost that is deemed to be attributable to credit loss results in a charge to earnings and the corresponding establishment of an allowance for credit losses against the cost basis of the security. Premiums and discounts are amortized (accreted) 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 Other expense, net in our Consolidated Statements of Operations 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, net 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 as an equity security and reported in Other investments in our Consolidated Balance Sheets. We have elected to measure our equity security, which does not have a readily determinable fair value and does not qualify for the practical expedient under Accounting Standards Codification ("ASC") 820, *Fair Value Measurement*, at cost less any impairment. The investment is periodically evaluated for impairment. An impairment loss is 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 4 - 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 and Equipment—Property 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
Computer equipment and software	2 - 5
Furniture and fixtures	7 - 10
Finance lease assets and 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 fiscal August 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 fair value to the carrying value of the reporting unit. For our assessment of indefinite-lived assets we compare the carrying value of the asset to the estimated fair value of the asset. If impairment exists, a loss is recorded to write down the value of the assets to their fair values. We performed our annual impairment tests of our goodwill and indefinite-lived intangible assets and the results of these tests indicated that our goodwill and indefinite-lived intangible assets were not impaired as of August 27, 2021 or August 28, 2020.

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, see *Note 10 - Impairments*, for further detail.

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.

Leases—We have operating leases for certain facilities, as well as manufacturing and office equipment. We have financing leases for our corporate headquarters, including our fabrication facility, and to a lesser extent, various manufacturing equipment.

These leases expire at various dates through 2038, and certain of these leases have renewal options with the longest ranging up to two ten-year periods.

We determine that a contract contains a lease at lease inception if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. In evaluating whether the right to control an identified asset exists, we assess whether we have the right to direct the use of the identified asset and obtain substantially all of the economic benefit from the use of the identified asset. Leases with a term greater than one year are recognized on the balance sheet as right-of-use ("ROU") assets and lease liabilities. For leases with a term of one year or less, categorized as short-term leases, we elected not to recognize the lease liability for these arrangements and the lease payments are recognized in the Consolidated Statements of Operations on a straight-line basis over the lease term. ROU assets and lease liabilities are recognized at the present value of future minimum lease payments over the lease term on the commencement date. ROU assets are initially measured as the amount of the initial lease liability, adjusted for initial direct costs, lease payments made at or before the commencement date, and reduced by lease incentives received. We include options to renew or terminate when determining the lease term when it is reasonably certain that the option will be exercised. Our lease agreements do not contain any material residual value guarantees or restrictive covenants.

Our leases may contain lease and non-lease components. We elected to account for lease and non-lease components in a contract as part of a single lease component. Fixed payments are considered part of the single lease component and included in the ROU assets and lease liabilities. Additionally, lease contracts typically include variable payments and other costs that do not transfer a separate good or service, such as reimbursement for real estate taxes and insurance, which are expensed as incurred.

Our leases generally do not provide an implicit interest rate. As a result, we utilize our incremental borrowing rates, which are the rates incurred to borrow on a collateralized basis over a similar term and amount equal to the lease payments in a similar economic environment.

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

We recognize 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. Non-product development and license revenue is not significant to our Revenue or Consolidated Statements of Operations for the periods presented. 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 stand-alone selling price.

Our product revenue is recognized when the customer obtains control of the product, 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 as of October 1, 2021 and October 2, 2020.

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 income (loss) per share is computed by dividing net income (loss) by the weighted-average number of common shares outstanding during the period, excluding the dilutive effect of common stock equivalents. Diluted net income (loss) per share reflects the dilutive effect of common stock equivalents, such as stock options, warrants, restricted stock units and convertible debt, 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. We recognize transfers between levels of the fair value hierarchy at the end of the reporting period.

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 fair 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. Our common stock warrants were classified as Level 3 due to unobservable inputs. We used the Black-Scholes option-pricing model to estimate the fair value of our common stock warrants, inclusive of assumptions for the risk-free interest rate, dividends, expected term and estimated volatility.

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 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, 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 our 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. We account for forfeitures when they occur. 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 as of each period end date, which is equivalent to the closing price of a share of our common stock on the period end date multiplied by the number of units earned, 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 vesting.

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 maintain 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 October 1, 2021 and October 2, 2020. 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 2021

On the first day of fiscal year 2021, we adopted Accounting Standards Update ("ASU") 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. This ASU introduces a new accounting model known as Credit Expected Credit Losses ("CECL"), which requires earlier recognition of credit losses. The CECL model utilizes a lifetime expected credit loss measurement objective for the recognition of credit losses for receivables at the time the financial asset is originated or acquired, replacing the current incurred loss methodology that delays recognition of credit losses until a probable loss has been incurred. There are other provisions within the standard affecting how impairments of other financial assets may be recorded and presented, as well as expanded disclosures. There was no impact to our consolidated financial statements from the adoption of this guidance.

In January 2017, the Financial Accounting Standards Board (the "FASB") issued ASU 2017-04, *Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment.* ASU 2017-04 simplifies the subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test. Instead, a one-step quantitative impairment test calculates goodwill impairment as the excess of the carrying value of a reporting unit over its fair value, up to the carrying value of the goodwill. This ASU should be applied on a prospective basis. We adopted this ASU in the first quarter of fiscal year 2021 and the adoption of this update did not have an impact on our consolidated financial statements and related disclosures.

Pronouncements for Adoption in Subsequent Periods

In March 2020, the FASB issued ASU 2020-04, *Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting*, which provides optional expedients and exceptions to applying the guidance on contract modifications, hedge accounting, and other transactions, to simplify the accounting for transitioning from the London Interbank Offered Rate, and other interbank offered rates expected to be discontinued, to alternative reference rates. The guidance in this Update was effective upon its issuance. If elected, the guidance is to be applied prospectively through December 31, 2022. We are currently evaluating the effect the potential adoption of this ASU will have on our consolidated financial statements, including but not limited to our Credit Agreement, as defined in *Note 16, Debt*.

In August 2020, the FASB issued ASU 2020-06, *Debt—Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*, which simplifies the accounting for certain financial instruments with characteristics of liability and equity, including convertible instruments and contracts on an entity's own equity. The standard reduces the number of models used to account for convertible instruments, removes certain settlement conditions that are required for equity contracts to qualify for the derivative scope exception, and requires the if-converted method for calculation of diluted earnings per share for all convertible instruments. The standard is effective for public companies for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2021. Early adoption is permitted, and we plan to adopt this amendment as of October 2, 2021, the first day of fiscal year 2022. We expect the resulting impact will be to reclassify $72.2 million of the equity component of our 2026 Convertible Notes, as defined in *Note 16 - Debt*, from additional paid-in capital to long-term debt, with the remaining $7.5 million to accumulated deficit. On a prospective basis, there will be a reduction of our reported effective interest rate of 4.25% on our 2026 Convertible Notes to their stated 0.25% coupon rate. For additional information regarding our debt, refer to *Note 16 - Debt.*

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		
	2021	2020	2019
Telecom	$ 188,391	$ 209,477	$ 180,938
Industrial & Defense	280,221	194,506	204,638
Data Center	138,308	126,054	114,132
Total	$ 606,920	$ 530,037	$ 499,708

	Fiscal Years		
Revenue by Geographic Region	2021	2020	2019
United States	$ 277,850	$ 217,474	$ 239,510
China	165,931	192,989	132,329
Asia Pacific, excluding China (1)	93,572	84,997	80,136
Other Countries (2)	69,567	34,577	47,733
Total	$ 606,920	$ 530,037	$ 499,708

(1) Asia Pacific primarily represents Taiwan, Japan, Singapore, Thailand, South Korea, Australia and Malaysia.
(2) No country or region represented greater than 10% of our total revenue as of the dates presented, other than the United States, 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 advanced consideration received from customers for contracts prior to the transfer of control to the customer, and therefore revenue is subsequently recognized upon delivery of products and services.

As of October 1, 2021, October 2, 2020 and September 27, 2019 our contract liabilities were $2.8 million, $9.9 million and $10.7 million, respectively. During the fiscal years ended October 1, 2021 and October 2, 2020, we recognized net sales of $9.4 million and $1.9 million, respectively, that were included in the contract liabilities balance at the beginning of the period. The decrease in contract liabilities during the fiscal year ended October 1, 2021 was primarily related to recognition of license and non-product development revenue, partially offset by the deferral of revenue for invoiced products and services prior to when certain of our customers obtained control of the product and or services.

As of October 1, 2021 and October 2, 2020, $0.9 million and $3.5 million of our contract liabilities were recorded as other long-term liabilities on our Consolidated Balance Sheets, respectively, with the remainder recorded in Accrued liabilities.

4. 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 are summarized in the tables below (in thousands):

	October 1, 2021			
	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Aggregate Fair Value
Corporate bonds	$ 73,653	$ 151	$ (171)	$ 73,633
Commercial paper	114,718	21	(7)	114,732
Total investments	$ 188,371	$ 172	$ (178)	$ 188,365

	October 2, 2020			
	Amortized Cost	Gross Unrealized Holding Gains	Gross Unrealized Holding Losses	Aggregate Fair Value
Corporate bonds	$ 68,605	$ 348	$ (333)	$ 68,620
Commercial paper	134,913	192	(14)	135,091
Total investments	$ 203,518	$ 540	$ (347)	$ 203,711

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

	October 1, 2021
Less than 1 year	$ 120,590
Over 1 year	67,775
Total investments	$ 188,365

We have determined that the gross unrealized losses on available for sale securities at October 1, 2021 and October 2, 2020 are temporary in nature and/or do not relate to credit loss, therefore there is no expense for credit losses recorded in our Consolidated Statements of Operations. We review our investments to identify and evaluate investments that have indications of possible impairment due to credit loss. The techniques used to measure the fair value of our investments are described in *Note 2 - Summary of Significant Accounting Policies*. Factors considered in determining whether a loss is due to credit loss include the extent to which fair value has been less than the cost basis, adverse conditions, 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.

During the fiscal years ended October 1, 2021, October 2, 2020 and September 27, 2019, we received proceeds from sales and maturities of available-for-sale securities of $209.3 million, $183.9 million and $173.0 million, respectively. During the fiscal years ended October 1, 2021, October 2, 2020 and September 27, 2019, gross realized gains were $0.5 million, $0.3 million and $0.2 million, respectively. During the fiscal years ended October 1, 2021, October 2, 2020 and September 27, 2019, gross realized losses were less than $0.1 million, $0.1 million and $0.2 million, respectively. Gross realized gains and losses were recorded within other expense in each period presented.

Other Investments — As of October 1, 2021 and October 2, 2020, we held two non-marketable equity investments classified as other long-term investments, which includes an investment in a Series B preferred stock ownership of a privately held manufacturing corporation with preferred liquidation rights over other equity shares. As the equity securities do not have a readily determinable fair value and do not qualify for the practical expedient under ASC 820, *Fair Value Measurement*, we have elected to account for this investment at cost less any impairment. During the fiscal quarter ended October 2, 2020, we identified impairment indicators for this investment and recorded an impairment charge of $2.5 million to Other expense. As of October 1, 2021 and October 2, 2020, the carrying value of this investment was $2.5 million.

Also included in long-term investments, is a non-controlling investment of less than 10% of the outstanding equity of a private company, Ampere Computing Holdings LLC (“Ampere”), that was acquired in conjunction with our divestiture of the Compute business during our fiscal year 2018. This investment’s carrying value is updated quarterly based on our proportionate share of the gains or losses, as well as any changes in Ampere's equity, utilizing the equity method. We are a passive investor with limited rights and are not engaged in the operating activities of Ampere. One of Ampere’s other limited liability company members has a call option right to purchase all of our equity during the period following October 27, 2021 and prior to 45 days thereafter, for a maximum fixed price of approximately $128.0 million which may not represent fair market value. We have no control and cannot predict when or if this call option will be exercised, whether our equity position will become liquid or whether it will become further diluted due to capital structure changes to Ampere. Any gain or loss from an exercise of a call option would be recognized at the time it is realized.

During fiscal years 2021, 2020 and 2019, we recorded $2.4 million, $3.4 million and $7.5 million of non-cash net losses associated with this investment as other expense in our Consolidated Statements of Operations. The net loss amounts for fiscal years 2021, 2020 and 2019 include non-cash gains of $9.8 million, $16.6 million and $10.8 million, respectively, associated with changes in Ampere’s equity. The carrying value of this investment was $12.8 million and $15.2 million as of October 1, 2021 and October 2, 2020, respectively.

5. FAIR VALUE

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 October 1, 2021.

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

	October 1, 2021			
	Fair Value	Active Markets for Identical Assets (Level 1)	Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets				
Money market funds	$ 26,363	$ 26,363	$ —	$ —
Commercial paper	114,732	—	114,732	—
Corporate bonds	73,633	—	73,633	—
Total assets measured at fair value	$ 214,728	$ 26,363	$ 188,365	$ —

	October 2, 2020			
	Fair Value	Active Markets for Identical Assets (Level 1)	Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets				
Money market funds	$ 20,139	$ 20,139	$ —	$ —
Commercial paper	135,091	—	135,091	—
Corporate bonds	68,620	—	68,620	—
Total assets measured at fair value	$ 223,850	$ 20,139	$ 203,711	$ —
Liabilities				
Warrant liability	25,312	—	—	25,312
Total liabilities measured at fair value	$ 25,312	$ —	$ —	$ 25,312

The quantitative information utilized in the fair value calculation of our Level 3 liabilities as of October 2, 2020, are as follows:

Liabilities	Valuation Technique	Unobservable Input	October 2, 2020
Warrant liability	Black-Scholes model	Volatility	61.8%
		Discount rate	0.09%
		Expected life	0.2 years
		Exercise price	$14.05
		Stock price	$33.80
		Dividend rate	—%

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		
Warrant Liability	**2021**	**2020**	**2019**
Balance - beginning of year	$ 25,312	$ 12,364	$ 13,129
Net Realized/Unrealized Losses (Gains) Included in Earnings	11,130	12,948	(765)
Settlements	(36,442)	—	—
Balance - end of year	$ —	$ 25,312	$ 12,364

	Fiscal Year
Contingent Consideration	**2019**
Balance - beginning of year	$ 585
Net Realized/Unrealized Losses (Gains) Included in Earnings	65
Settlements	(650)
Balance - end of year	$ —

6. ACCOUNTS RECEIVABLES ALLOWANCES

We generate accounts receivable from customers and they are classified as short-term. We monitor collections and maintain a provision for expected credit losses based on historical trends, current conditions, and relevant forecasted information, in addition to provisions established for any specific collection issues that have been identified.

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

	Fiscal Year		
	2021	**2020**	**2019**
Balance - beginning of year	$ 2,893	$ 5,047	$ 6,795
Provision, net	16,213	10,774	11,989
Charge-offs	(16,311)	(12,928)	(13,737)
Balance - end of year	$ 2,795	$ 2,893	$ 5,047

The balances at the end of fiscal years 2021, 2020 and 2019 are comprised primarily of compensation credits of $2.6 million, $2.8 million and $4.5 million, respectively. The allowance for doubtful accounts is immaterial as of October 1, 2021, October 2, 2020 and September 27, 2019.

7. INVENTORIES

Inventories consist of the following (in thousands):

	October 1, 2021	October 2, 2020
Raw materials	$ 50,950	$ 46,954
Work-in-process	9,201	9,324
Finished goods	22,548	35,306
Total	$ 82,699	$ 91,584

8. PROPERTY AND EQUIPMENT

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

	October 1, 2021	October 2, 2020
Construction in process	$ 24,086	$ 16,174
Machinery and equipment	200,843	191,953
Leasehold improvements	24,347	19,854
Furniture and fixtures	2,377	2,659
Computer equipment and software	17,749	18,487
Finance lease assets	35,589	35,589
Total property and equipment	304,991	284,716
Less accumulated depreciation and amortization	(184,465)	(165,850)
Property and equipment — net	$ 120,526	$ 118,866

Depreciation and amortization expense related to property and equipment for fiscal years 2021, 2020 and 2019 was $23.7 million, $28.5 million and $29.7 million, respectively. Accumulated amortization on finance lease assets as of October 1, 2021 and October 2, 2020 was $4.9 million and $2.5 million, respectively.

9. INTANGIBLE ASSETS

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

	Fiscal Years		
	2021	2020	2019
Cost of revenue	$ 15,296	$ 17,462	$ 29,847
Selling, general and administrative	30,917	32,868	44,872
Total	$ 46,213	$ 50,330	$ 74,719

Intangible assets consist of the following (in thousands):

	October 1, 2021	October 2, 2020
Acquired technology	$ 179,434	$ 179,434
Customer relationships	245,870	245,870
Trade name, indefinite lived	3,400	3,400
Total	428,704	428,704
Less accumulated amortization	(344,019)	(297,806)
Intangible assets — net	$ 84,685	$ 130,898

As of October 1, 2021, our estimated amortization of our intangible assets in future fiscal years, was as follows (in thousands):

	2022	2023	2024	2025	2026	Thereafter
Amortization expense	$ 33,433	26,048	15,410	3,490	1,644	1,260

Accumulated amortization for the acquired technology and customer relationships was $167.3 million and $176.7 million, respectively, as of October 1, 2021, and $152.1 million and $145.7 million, respectively, as of October 2, 2020.

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

	Gross Intangible Assets				
	Total Intangibles	Acquired Technology	Customer Relationships	Trade Name	Total Goodwill
Balance as of September 27, 2019	$ 428,952	$ 179,682	$ 245,870	$ 3,400	$ 314,727
Currency translation adjustments	—	—	—	—	285
Disposals of intangible assets	(248)	(248)	—	—	—
Balance as of October 2, 2020	428,704	179,434	245,870	3,400	315,012
Currency translation adjustments	—	—	—	—	(772)
Balance as of October 1, 2021	$ 428,704	$ 179,434	$ 245,870	$ 3,400	$ 314,240

10. 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 12 - 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 and equipment, were recoverable. 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 and technology intangible assets, respectively, in fiscal year 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 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 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 to intangible assets and assets recorded as construction in process for fiscal year 2019 were $264.8 million.

See *Note 12 - Restructurings* for information related to property and equipment impaired as part of our restructuring actions.

11. ACCRUED LIABILITIES

Accrued liabilities consist of the following (in thousands):

	October 1, 2021	October 2, 2020
Compensation and benefits	$ 33,468	$ 32,254
Distribution costs	8,444	8,889
Current portion of operating leases	7,457	7,601
Product warranty	2,225	1,858
Deferred revenue	1,904	6,346
Professional fees	1,188	1,300
Other	8,688	5,406
Total accrued liabilities	$ 63,374	$ 63,654

12. 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.

There were no restructuring charges incurred during fiscal year 2021. The following is a summary of the restructuring charges incurred for the periods presented (in thousands):

	Fiscal Years	
	2020	2019
Employee-related expenses	$ 378	$ 8,084
Facility-related expenses	761	11,459
Total restructuring expenses	$ 1,139	$ 19,543

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 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
Charges	378	761	1,139
Charges paid/settled	(1,692)	(1,713)	(3,405)
Balance - October 2, 2020	$ 235	$ 26	$ 261
Charges and adjustments	—	—	—
Charges paid/settled	(235)	(26)	(261)
Balance - October 1, 2021	$ —	$ —	$ —

(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.

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 six development facilities in France, Japan, the Netherlands, Florida, Massachusetts and Rhode Island, reducing certain development activities for one of our product lines and no longer investing in the design and development of optical modules and subsystems for Data Center applications (the “2019 Plan”). During the fiscal year ended October 2, 2020, we incurred restructuring expenses of $1.2 million under the 2019 Plan, including $0.8 million of facility-related costs and $0.4 million of employee-related costs. We incurred restructuring charges of $11.6 million in the fiscal year ended September 27, 2019, 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. This action was completed during fiscal 2020 and we do not expect to incur further costs. The remaining charges were paid during fiscal year 2021.

The following is a summary of the costs incurred and remaining balances included in accrued expenses related to the 2019 Plan actions taken (in thousands):

	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 - September 27, 2019	$ 1,536	$ 457	$ 1,993
Charges and adjustments	378	819	1,197
Charges paid/settled	(1,679)	(1,250)	(2,929)
Balance - October 2, 2020	$ 235	$ 26	$ 261
Charges paid/settled	(235)	(26)	(261)
Balance - October 1, 2021	$ —	$ —	$ —

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 were paid during fiscal year 2020.

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

	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	$ —	$ 451	$ 451
Charges and adjustments	—	(18)	(18)
Charges paid/settled	—	(433)	(433)
Balance - October 2, 2020	$ —	$ —	$ —

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 the remaining charges were paid during fiscal year 2020.

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

	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	$ 13	$ 70	$ 83
Charges and adjustments	—	(40)	(40)
Charges paid/settled	(13)	(30)	(43)
Balance - October 2, 2020	$ —	$ —	$ —

13. 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		
	2021	**2020**	**2019**
Balance — beginning of year	$ 1,858	$ 3,273	$ 5,756
Provisions (benefit)	5,677	2,271	(3,053)
(Payments) direct charges	(5,310)	(3,686)	570
Balance — end of year	$ 2,225	$ 1,858	$ 3,273

14. 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 years ended October 1, 2021, October 2, 2020 and September 27, 2019, we contributed $2.3 million, $2.3 million and $2.6 million to our 401(k) Plan for calendar years 2020, 2019 and 2018, respectively.

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 $1.3 million, $1.0 million and $1.1 million for fiscal years 2021, 2020 and 2019, respectively.

15. COMMITMENTS AND CONTINGENCIES

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 2021 and 2020, the estimated costs for the removal of these assets are recorded as asset retirement obligations in other long-term liabilities were $1.9 million and $1.9 million, respectively.

Purchase Commitments—As of October 1, 2021, we had outstanding non-cancelable purchase commitments of $82.7 million primarily for purchases of services and inventory supply arrangements. In addition, we have $27.2 million in fixed payments associated with a power purchase agreement that is expected to commence in fiscal 2022 and has a 15-year term. See *Note 17- Financing Obligation* for additional detail on the power purchase agreement.

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 litigation. 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 October 1, 2021.

16. DEBT

The following represents the outstanding balances and effective interest rates of our borrowings as of October 1, 2021 and October 2, 2020, (in thousands, except percentages):

	October 1, 2021		October 2, 2020	
	Principal Balance	Effective Interest Rate	Principal Balance	Effective Interest Rate
LIBOR plus 2.25% term loans due May 2024	$ 120,766	2.33 %	$ 666,087	2.40 %
0.25% convertible notes due March 2026	450,000	4.25 %	—	— %
Total principal amount outstanding	570,766		666,087	
Less: Unamortized discount on term loans and deferred financing costs	(5,567)		(7,030)	
Less: Unamortized discount on convertible notes	(73,102)		—	
Less: Current portion of long term debt	—		6,885	
Total long-term debt	$ 492,097		$ 652,172	

Term Loans

As of October 1, 2021, we are party to a credit agreement dated as of May 8, 2014 with a syndicate of lenders and Goldman Sachs Bank USA, 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”).

The Credit Agreement consists 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 expired on November 8, 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%.

During fiscal year 2021, we repaid $543.6 million in principal under the Term Loans using $443.6 million of the net proceeds from our 2026 Convertible Notes offering, described below, as well as existing cash and short-term investments. In connection with these prepayments, during fiscal year 2021, we expensed unamortized deferred financing costs and recognized losses on extinguishment of debt of $4.4 million within the Other expense, net line in our Consolidated Statements of Operations. The loss on extinguishment is a non-cash adjustment to cash flows from operating activities in our Consolidated Statements of Cash Flows for the fiscal year 2021.

As of October 1, 2021, there are no minimum principal repayments on the Term Loans until 2024 when the remaining principal balance of $120.8 million becomes due. The fair value of the Term Loans was estimated to be approximately $120.2 million as of October 1, 2021 and was determined using Level 2 inputs, including a quoted price from a financial institution.

As of October 1, 2021, approximately $1.0 million of deferred financing costs remain unamortized, of which $0.9 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 less than $0.1 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.

2026 Convertible Notes

On March 25, 2021, we issued 0.25% convertible senior notes due in 2026, pursuant to an indenture dated as of such date (the “Indenture”), between the Company and U.S. Bank National Association, as trustee, with an aggregate principal amount of $400.0 million (the “Initial Notes”), and on April 6, 2021, we issued an additional $50.0 million aggregate principal amount (the “Additional Notes”) (together, the “2026 Convertible Notes”). No additional 2026 Convertible Notes will be issued and the aggregate principal balance is $450.0 million. The 2026 Convertible Notes will mature on March 15, 2026, unless earlier converted, redeemed or repurchased.

The Additional Notes were issued and sold to the initial purchaser of the Initial Notes, pursuant to the option to purchase the Additional Notes granted by the Company to the initial purchaser and have the same terms as the Initial Notes.

Holders of the 2026 Convertible Notes may convert their notes at their option at any time prior to the close of business on the business day immediately preceding December 15, 2025 in multiples of $1,000 principal amount, only under the following circumstances: (i) during any fiscal quarter commencing after the fiscal quarter ending on July 2, 2021 (and only during such fiscal quarter), if the last reported sale price of our common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on the last trading day of the immediately preceding fiscal quarter is greater than or equal to 130% of the conversion price for the notes on each applicable trading day; (ii) during the five business day period after any five consecutive trading day period (the "Measurement Period") in which the "trading price" (as defined in the Indenture) per $1,000 principal amount of the notes for each trading day of the Measurement Period was less than 98% of the product of the last reported sale price of our common stock and the conversion rate for the notes on each such trading day; (iii) if we call such notes for redemption, at any time prior to the close of business on the second scheduled trading day immediately preceding the applicable redemption date; or (iv) upon the occurrence of specified corporate events described in the Indenture. On or after December 15, 2025 until the close of business on the second scheduled trading day immediately preceding the maturity date, holders may convert their notes in multiples of $1,000 principal amount, regardless of the foregoing circumstances.

The initial conversion rate for the 2026 Convertible Notes is 12.1767 shares of common stock per $1,000 principal amount of the notes, equivalent to an initial conversion price of approximately $82.12 per share of common stock. The conversion rate will be subject to adjustment upon the occurrence of certain specified events in the Indenture.

Upon conversion of the 2026 Convertible Notes, we had the option to pay or deliver, as the case may be, cash, shares of our common stock or a combination of cash and shares of our common stock, at our election (subject to, and in accordance with, the settlement provisions of the Indenture). In November 2021, we made an irrevocable election to pay cash up to the aggregate principal amount of the notes to be converted and pay or deliver, as the case may be, cash, shares of our common stock or a combination of cash and shares of our common stock, at our election, in respect of the remainder, if any, of our conversion obligation in excess of the aggregate principal amount of the notes being converted (subject to, and in accordance with, the settlement provisions of the Indenture). We may not redeem the notes prior to March 20, 2024. We may redeem for cash all or any portion of the notes, at our option, on or after March 20, 2024 if the last reported sale price per share of our common stock has been at least 130% of the conversion price then in effect for at least 20 trading days (whether or not consecutive), including the trading day immediately preceding the date on which we provide notice of redemption, during any 30 consecutive trading day period ending on, and including, the trading day immediately preceding the date on which we provide notice of redemption, at a redemption price equal to 100% of the principal amount of the notes to be redeemed, plus accrued and unpaid interest, to, but not including, the redemption date.

The Indenture does not contain any financial or operating covenants or restrictions on the payments of dividends, the making of investments, the incurrence of indebtedness or the purchase or prepayment of securities by us or any of our subsidiaries.

The proceeds from the issuance of the 2026 Convertible Notes have been allocated between the conversion feature recorded as equity and the liability for the notes themselves. The carrying amount of the liability component was calculated by measuring the fair value of a similar debt instrument that does not have an associated convertible feature. The carrying amount of the equity component representing the conversion option was determined by deducting the fair value of the liability component from the par value of the 2026 Convertible Notes. The difference of $80.7 million between the principal amount of the 2026 Convertible Notes and the liability component (the "Debt Discount") is amortized to interest expense using the effective interest method over the term of the 2026 Convertible Notes. The equity component of the 2026 Convertible Notes is included in additional paid-in capital in the consolidated balance sheet and is not remeasured as long as it continues to meet the conditions for equity classification.

In accounting for the transaction costs related to the 2026 Convertible Notes, we allocated the total amount incurred of approximately $5.7 million to the liability and equity components of the 2026 Convertible Notes based on the proportion of the proceeds allocated to the debt and equity components. Issuance costs attributable to the liability component were approximately $4.7 million, were recorded as additional Debt Discount and are amortized to interest expense over the contractual terms of the 2026 Convertible Notes. Issuance costs attributable to the equity component were approximately $1.0 million and are recorded as a reduction of additional paid in capital in stockholders' equity.

For fiscal year 2021, accretion of the Debt Discount included in interest expense was $7.6 million, and as of October 1, 2021, the unamortized discount on the 2026 Convertible Notes was $73.1 million. For fiscal year 2021, total interest expense for the 2026 Convertible Notes was $8.2 million.

The fair value of our 2026 Convertible Notes, including the conversion feature, was $479.4 million as of October 1, 2021 and was determined based on quoted prices in markets that are not active, which is considered a Level 2 valuation input.

There are no future minimum principal payments under the notes as of October 1, 2021; the full amount of $450.0 million is due in fiscal 2026.

17. FINANCING OBLIGATION

On July 17, 2020, we entered into a power purchase agreement, which includes installation of electric power and thermal energy producing systems at our fabrication facility in Lowell, Massachusetts. This system is expected to reduce our consumption of energy while delivering sustainable, resilient energy for heating and cooling. Despite not being the legal owner of these systems, for accounting purposes only we are deemed to be the owner of the power generator during construction since we control the use of the asset. As of October 1, 2021, we capitalized $8.9 million of construction in process to Property and equipment, net and recorded a corresponding liability of $8.9 million primarily to Financing obligation on our consolidated balance sheet. The financing obligation was calculated based on future fixed payments allocated to the power generator of $16.8 million over the 15-year term, discounted at an implied discount rate of 7.7%, and the remaining future minimum payments are for power purchases. In total, we have $27.2 million in fixed payments associated with the power purchase agreement which is expected to commence in fiscal 2022 and has a 15-year term.

18. LEASES

Included in our Consolidated Balance Sheets were the following amounts related to operating and finance lease assets and liabilities (in thousands):

	October 1, 2021	October 2, 2020	Consolidated Balance Sheet Classification
Assets:			
Operating lease ROU assets	$ 29,946	$ 33,307	Other long-term assets
Finance lease assets	30,664	33,127	Property and equipment, net
Total lease assets	$ 60,610	$ 66,434	
Liabilities:			
Current:			
Operating lease liabilities	$ 7,457	$ 7,601	Accrued liabilities
Finance lease liabilities	958	1,368	Current portion of finance lease obligations
Long-term:			
Operating lease liabilities	28,607	31,837	Other long-term liabilities
Finance lease liabilities	28,037	28,994	Finance lease obligations, less current portion
Total lease liabilities	$ 65,059	$ 69,800	

The weighted-average remaining lease terms and weighted-average discount rates for operating and finance leases were as follows:

	October 1, 2021	October 2, 2020
Weighted-average remaining lease term (in years):		
Operating leases	6.0	6.4
Finance leases	16.4	17.0
Weighted-average discount rate:		
Operating leases	5.9 %	6.2 %
Finance leases	6.6 %	6.7 %

The components of lease expense were as follows (in thousands):

	Fiscal Year October 1, 2021	Fiscal Year October 2, 2020
Finance lease cost:		
Amortization of lease assets	$ 2,462	$ 3,022
Interest on lease liabilities	1,979	2,155
Total finance lease cost	$ 4,441	$ 5,177
Operating lease cost	$ 9,732	$ 9,815
Variable lease cost	$ 3,091	$ 2,645
Short-term lease cost	$ 217	$ 368
Sublease income	$ 694	$ 592

Rent expense incurred under non-cancelable operating leases was $9.7 million in fiscal year 2019.

Cash paid for amounts included in the measurement of lease liabilities were as follows (in thousands):

	Fiscal Year Ended October 1, 2021	Fiscal Year Ended October 2, 2020
Cash paid for amounts included in measurement of lease liabilities:		
Operating cash flows from operating leases	$ 10,383	$ 9,562
Operating cash flows from finance leases	$ 1,979	$ 2,155
Financing cash flows from finance leases	$ 1,368	$ 1,708
Non-cash activities:		
Operating lease ROU assets obtained in exchange for new lease liabilities	$ 4,890	$ 3,788
Financing lease assets obtained in exchange for new lease liabilities	$ —	$ 586

As of October 1, 2021, maturities of lease payments by fiscal year were as follows (in thousands):

Fiscal year ending:	Operating Leases	Finance Leases
2022	$ 9,353	$ 2,836
2023	7,762	2,820
2024	6,877	2,855
2025	4,783	2,783
2026	3,847	2,680
Thereafter	10,447	34,472
Total lease payments	$ 43,069	$ 48,446
Less: interest	(7,005)	(19,451)
Present value of lease liabilities	$ 36,064	$ 28,995

19. 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 October 1, 2021 and October 2, 2020. The outstanding shares of common stock as of October 1, 2021 presented in the accompanying Consolidated Statements of Stockholders' Equity, excludes 2,093 unvested shares of restricted stock awards, issued as compensation to employees that were subject to forfeiture. There were 5,414 unvested shares of restricted stock awards that were subject to forfeiture as of October 2, 2020.

Common Stock Warrants—In March 2012, we issued warrants to purchase 1,281,358 shares of common stock for $14.05 per share. During November 2020, Summit Partners Private Equity Fund VII-A, L.P., Summit Partners Private Equity Fund VII-B, L.P., Summit Investors I, LLC, Summit Investors I (UK), L.P. and Mainsail Partners II, L.P. made cashless exercises of warrants for 1,281,358 shares at an exercise price of $14.05 per share, resulting in the issuance of 857,631 shares of common stock.

Through the date of exercise, we recorded 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 Consolidated Statements of Operations. As of October 1, 2021, no warrants remain outstanding.

20. SHARE-BASED COMPENSATION PLANS

Stock Plans

We have five equity incentive plans: the Amended and Restated 2009 Omnibus Stock Plan ("2009 Plan"), the 2012 Omnibus Incentive Plan, as amended ("2012 Plan"), the 2021 Omnibus Incentive Plan ("2021 Plan"), the 2012 Employee Stock Purchase Plan, as amended and restated ("2012 ESPP") and the 2021 Employee Stock Purchase Plan ("2021 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. The 2021 Plan replaced the 2012 Plan and, following the adoption of the 2021 Plan on March 4, 2021, no additional awards have been or will be made under the 2012 Plan. We have outstanding awards under the 2021 Plan, as well as the 2012 Plan. Under the 2021 Plan, we have the ability to issue incentive stock options ("ISOs"), non-statutory stock options ("NSOs"), stock appreciation rights ("SARS"), restricted stock awards ("RSAs"), unrestricted stock awards, stock units (including restricted stock units ("RSUs") and performance-based restricted stock units ("PRSUs")), performance awards, cash awards, and other share-based awards to employees, directors, consultants and advisors. The ISOs and NSOs must be granted at an exercise price, and the SARS must be granted at a base value, per share of not less than 100% of the closing price of a share of our common stock on the date of grant (or, if no closing price is reported on that date, the closing price on the immediately preceding date on which a closing price was reported) (110% in the case of certain ISOs). Options granted primarily vest based on certain market-based and performance-based criteria as described below and generally have a term of four to seven years. Certain of the share-based awards granted and outstanding as of October 1, 2021, are subject to accelerated vesting upon a sale of the Company or similar changes in control.

As of October 1, 2021, we had 5.9 million shares available for future issuance under the 2021 Plan and 1.5 million shares available for issuance under our 2021 ESPP.

Incentive Stock Units

Outside of the five 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.

A summary of ISU activity for fiscal year 2021 is as follows (in thousands, except per unit amounts):

	Number of Units	Weighted-Average Grant Date Fair Value
Issued and unvested - October 2, 2020	226	$ 21.83
Granted	44	36.91
Vested	(77)	23.40
Forfeited, canceled or expired	(57)	23.66
Issued and unvested - October 1, 2021	136	$ 25.06

As of October 1, 2021 and October 2, 2020, the fair value of outstanding awards was $8.9 million and $7.6 million, respectively, and the associated accrued compensation liability was $6.2 million and $4.6 million, respectively. During fiscal years 2021, 2020 and 2019, 76,894, 62,344 and 69,035 ISU awards vested, respectively, and were paid at a fair value of $4.2 million, $1.9 million and $1.2 million, respectively.

During fiscal years 2021, 2020 and 2019, we recorded an expense for these ISU awards of $5.8 million, $4.4 million and $1.3 million, respectively. These expenses are not included in the share-based compensation expense totals below.

Employee Stock Purchase Plan

The 2021 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 2021 ESPP, the board of directors has limited discretion to set the length of the offering periods thereunder. As of October 1, 2021, no purchases have been made under the 2021 ESPP Plan. In fiscal years 2021, 2020 and 2019, 166,275, 272,469 and 421,777 shares of common stock were issued under the 2012 ESPP, 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		
	2021	2020	2019
Cost of revenue	$ 3,298	$ 3,609	$ 2,936
Research and development	13,332	12,794	8,551
Selling, general and administrative	18,368	19,271	12,305
Total	$ 34,998	$ 35,674	$ 23,792

As of October 1, 2021, 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 $39.7 million, which we expect to recognize over a weighted-average period of 2.0 years. As of October 1, 2021, total unrecognized compensation cost related to the 2021 ESPP was $0.2 million.

Restricted Stock Awards and Units

A summary of RSU, PRSU and RSA activity for fiscal year 2021 is as follows (in thousands, except per share amounts):

	Number of Shares	Weighted-Average Grant Date Fair Value
Issued and unvested - October 2, 2020	2,788	$ 20.84
Granted	968	31.32
Vested	(1,285)	21.38
Forfeited, canceled or expired	(120)	26.51
Issued and unvested - October 1, 2021	2,351	$ 24.57

The total fair value of restricted stock awards and units vested was $64.1 million, $19.1 million and $11.7 million for the fiscal years 2021, 2020 and 2019, respectively. RSUs granted generally vest over a period of three or 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 typically 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 in November following the performance period in which the performance condition was met, when the Company's annual financial performance is announced to the financial markets. 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. During fiscal year 2021, the performance condition for 143,485 target shares were earned at 300%, and therefore 430,455 shares with a total grant date fair value of $7.7 million vested in November 2020 when the service condition was achieved. During fiscal year 2021, we granted 94,832 PRSUs and 10,644 were forfeited. The amount of incremental PRSU awards that could ultimately vest if all performance criteria are achieved would be 1,197,675 shares assuming a maximum of 300% of the targeted shares.

We granted 200,000 market-based PRSUs 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 stockholder 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	—

Stock Options

A summary of stock option activity for fiscal year 2021 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 - October 2, 2020	325	$ 15.12		
Granted	—	—		
Exercised	(120)	16.54		
Forfeited, canceled or expired	—	—		
Options outstanding - October 1, 2021	205	$ 14.29	7.40	$ 10,465
Options vested - October 1, 2021	205	$ 14.29	7.40	$ 10,465
Options exercisable - October 1, 2021	205	$ 14.29	7.40	$ 10,465

Aggregate intrinsic value represents the difference between our closing stock price on October 1, 2021, and the exercise price of outstanding, in-the-money options. The total intrinsic value of options exercised was $5.3 million, $1.4 million and $0.7 million for fiscal years 2021, 2020 and 2019, respectively.

Stock Options with Market-based Vesting Criteria

We grant NSOs 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. As of October 1, 2021, all stock options with market-based vesting criteria have vested and no unrecognized compensation cost remains to be recognized.

There were no stock options with market-based vesting criteria granted for fiscal years 2021 and 2020, respectively. Stock options with market-based vesting criteria granted for fiscal year 2019 was 585,000 at weighted average grant date fair value of $7.47 per share, or total grant date fair value of $2.4 million.

These NSOs 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 Year
	2019
Risk-free interest rate	2.8 %
Expected term (years)	3.90
Expected volatility	51.9 %
Target price	$53.87

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 then current 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 October 1, 2021 was $0.1 million.

21. 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):

	October 1, 2021	October 2, 2020
Deferred tax assets:		
Net operating loss and credit carryforward	$ 268,450	$ 278,418
Intangible assets	20,853	15,880
Accrued expenses	17,938	14,564
Lease obligations	13,481	12,732
Minority equity investments	1,564	1,010
Property and equipment	—	3,274
Interest	—	5,471
Gross deferred tax asset	322,286	331,349
Less valuation allowance	(250,287)	(277,442)
Deferred tax asset, net of valuation allowance	$ 71,999	$ 53,907
Deferred tax liabilities:		
Convertible notes	$ (17,734)	$ —
Right of use lease asset	(14,680)	(14,057)
Property and equipment	(2,307)	—
Deferred tax liabilities	(34,721)	(14,057)
Net deferred tax asset	$ 37,278	$ 39,850

As of October 1, 2021 and October 2, 2020, our Consolidated Balance Sheets included $39.5 million and $41.9 million, respectively, of deferred income taxes recorded as long-term assets and $2.2 million and $2.1 million, respectively, of deferred income taxes recorded in Other long-term liabilities.

As of October 1, 2021, we had $855.8 million of gross federal net operating loss (“NOL”) carryforwards, primarily related to acquisitions made in prior fiscal years. The federal NOL carryforwards will expire at various dates through 2038 for losses generated prior to the tax period ended September 27, 2019. For losses generated during the tax period ended September 27, 2019 and future years, the NOL carryforward period is indefinite. 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 (loss) income from continuing operations before taxes were as follows (in thousands):

	Fiscal Years		
	2021	2020	2019
United States	$ 15,984	$ (65,915)	$ (458,617)
Foreign	26,961	24,353	35,464
Income (loss) from operations before income taxes	$ 42,945	$ (41,562)	$ (423,153)

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

	Fiscal Years		
	2021	2020	2019
Current:			
Federal	$ 32	$ (834)	$ 70
State	73	48	36
Foreign	2,403	1,958	876
Current provision (benefit)	2,508	1,172	982
Deferred:			
Federal	9,596	(8,635)	(21,560)
State	(2,379)	(22,613)	12,907
Foreign	3,177	9,686	(41,108)
Change in valuation allowance	(7,930)	24,906	9,424
Deferred provision (benefit)	2,464	3,344	(40,337)
Total provision (benefit)	$ 4,972	$ 4,516	$ (39,355)

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. We have significant negative objective evidence in the form of adjusted cumulative losses in the U.S. over the three-year period ended October 1, 2021 that resulted in our continued determination that there was not sufficient objectively verifiable positive evidence to offset this negative objective evidence and we concluded that a full valuation allowance was still appropriate for our U.S. deferred tax assets.

The $250.3 million of valuation allowance as of October 1, 2021 relates primarily to federal and state NOLs, tax credit carryforwards and a partial valuation allowance on tax credits in Canada of $7.1 million whose recovery is not considered more likely than not. The $277.4 million of valuation allowance as of October 2, 2020 related primarily to federal and state NOLs, tax credit carryforwards and a partial valuation allowance on tax credits in Canada of $8.0 million, for which recovery is not considered likely. The change during the fiscal year ended October 1, 2021 of $27.1 million primarily relates to the initial recognition of a deferred tax liability relating to our newly issued convertible debt which is offset by a reduction in our valuation allowance, and a reduction in our net NOL and credit carryforwards.

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

	Fiscal Years		
	2021	2020	2019
Federal statutory rate	21.0%	21.0%	21.0%
Change in valuation allowance	(19.4)	(60.5)	(2.4)
Global intangible low taxed income	17.0	(11.4)	(2.9)
Research and development credits	(8.3)	20.7	1.4
Warrant liability	5.4	(6.5)	—
Foreign rate differential	(5.0)	9.1	1.6
Stock compensation	(5.0)	(4.1)	(0.6)
Provision to return adjustments	2.7	25.4	0.3
State taxes net of federal benefit	2.0	0.9	0.9
Intra-entity license transfer	—	(4.6)	9.4
Section 382 adjustment	—	—	(19.3)
Other permanent differences	1.2	(0.9)	(0.1)
Effective income tax rate	11.6%	(10.9)%	9.3%

For fiscal years 2021, 2020 and 2019, the effective tax rates on $42.9 million, $(41.6) million and $(423.2) million, respectively, of pre-tax income (loss) from continuing operations were 11.6%, (10.9)% and 9.3%, respectively. The effective income tax rates for fiscal years 2021, 2020 and 2019 were 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, a fair market value adjustment of our warrant liability and the inclusion of Global Intangible Low Taxed Income. For fiscal year 2020, the effective tax rate was also impacted by an adjustment in our Section 382 limitation which increased our California NOL carryforwards. For fiscal year 2019, the effective tax rate was impacted by a change in our NOL carryforward due to an adjustment in our Section 382 limitation from a prior period acquisition and was also impacted by 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.

On March 27, 2020, the U.S. Congress enacted the Coronavirus Aid Relief & Economic Security Act ("CARES Act"). The CARES Act made a technical correction to the Tax Act impacting the Company's NOL carryforward for the fiscal year ending September 29, 2018 by limiting it to a 20-year carryforward period, rather than having an indefinite life carryforward without the 80% limitation. This technical correction resulted in the Company increasing its indefinite lived deferred tax liability by $1.4 million during fiscal year 2020, with an offsetting adjustment to tax expense.

The liability for unrecognized tax benefits was zero as of October 1, 2021 and $0.3 million as of October 2, 2020 and September 27, 2019. During the fiscal year ending October 1, 2021, we reported a reduction of $0.3 million in unrecognized tax benefits due to closure of the related audit periods. The full reduction in unrecognized tax benefits reduced our income tax expense.

A summary of the fiscal tax years that remain subject to examination, as of October 1, 2021, for the Company's significant tax jurisdictions are:

Jurisdiction	Fiscal Years Subject to Examination
United States—federal	Fiscal Year 2018 - forward
United States—various states	Fiscal Year 2017 - forward
Ireland	Fiscal Year 2016 - forward

Generally, we are no longer subject to federal income tax examinations for fiscal years before 2018, except to the extent of loss and tax credit carryforwards from those years.

22. RELATED-PARTY TRANSACTIONS

During fiscal year 2020, we sold $0.4 million of commercial products to Mission Microwave Technologies, LLC ("Mission"), a MACOM customer and an affiliate of directors John and Susan Ocampo. Together, Mr. and Mrs. Ocampo are MACOM's largest stockholders. Stephen G. Daly, the Company's President and Chief Executive Officer, has an equity interest of less than 1% in Mission.

23. 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		
	2021	2020	2019
Numerator:			
Net income (loss) attributable to common stockholders	$ 37,973	$ (46,078)	$ (383,798)
Denominator:			
Weighted average common shares outstanding-basic	68,449	66,606	65,686
Dilutive effect of equity awards	2,025	—	—
Weighted average common shares outstanding-diluted	70,474	66,606	65,686
Common stock earnings per share-basic:			
Net common stock earnings per share-basic	$ 0.55	$ (0.69)	$ (5.84)
Common stock earnings per share-diluted:			
Net common stock earnings per share-diluted	$ 0.54	$ (0.69)	$ (5.84)

As of October 2, 2020, we had warrants outstanding which were measured at fair value. During fiscal year 2019 we recorded gains of $0.8 million 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 fiscal years 2021, 2020 and 2019, we excluded the effects of the warrant and the respective 87,494, 639,133 and 214,303 potential shares of common stock issuable upon exercise of warrants as the inclusion would be anti-dilutive. The table excludes the effects of 87,494, 1,755,973, and 386,552 shares for fiscal years 2021, 2020 and 2019, 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. The 2026 Convertible Notes do not have an impact on diluted earnings per share for fiscal year 2021.

24. SUPPLEMENTAL CASH FLOW INFORMATION

The following is supplemental cash flow information for the periods presented (in thousands):

	Fiscal Years		
	2021	2020	2019
Cash paid for interest	$ 11,836	$ 24,672	$ 34,157
Cash paid (refunded) for income taxes	$ 1,621	$ (17,465)	$ (1,931)
Non-cash activities:			
Non-cash capital expenditures	$ 9,398	$ 636	$ 840
Issuance of common stock for the cashless exercise of warrants	$ 36,442	$ —	$ —

During fiscal year 2021, we capitalized $8.9 million of non-cash costs to property and equipment associated with construction of a power generator that are paid by our service provider and is included in non-cash capital expenditures above. See *Note 17- Financing Obligation*.

During fiscal year 2019, we capitalized $1.5 million of net construction costs relating to the facility in Lowell, Massachusetts, of which $0.3 million was accounted for as a non-cash transaction as the costs were paid by the developer.

For additional information on the issuance of common stock for the cashless exercise of warrants, see *Note 19- Stockholders' Equity.*

25. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS)

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

	Foreign Currency Items	Other Items	Total
Balance - September 27, 2019	$ 4,330	$ 28	$ 4,358
Foreign currency translation loss, net of tax	458	—	458
Unrealized loss on short-term investments, net of tax	—	193	193
Balance - October 2, 2020	4,788	221	5,009
Foreign currency translation gain, net of tax	(661)	—	(661)
Unrealized gain on short-term investments, net of tax	—	(198)	(198)
Balance - October 1, 2021	$ 4,127	$ 23	$ 4,150

26. 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") 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. In evaluating financial performance and making operating decisions, the CODM primarily uses consolidated metrics. 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 net property and equipment in different geographic regions is presented below (in thousands):

	As of	
Net Property and Equipment by Geographic Region	**October 1, 2021**	**October 2, 2020**
United States	$ 103,527	$ 99,118
Europe [1]	12,766	13,129
Other Countries [2]	4,233	6,619
Total	$ 120,526	$ 118,866

(1) Europe represents Finland, France, Germany, Ireland and Italy.
(2) Other than the United States and Europe, no country or region represented greater than 10% of the total net property and equipment as of the dates presented.

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

	Fiscal Years		
Revenue	**2021**	**2020**	**2019**
Customer A	11 %	14 %	16 %
Customer B	—	12 %	—
Customer C	—	12 %	—

Accounts Receivable	**October 1, 2021**	**October 2, 2020**
Customer A	—	20 %

Customers B and C did not represent more than 10% of revenue in fiscal year ended 2021 and Customer A did not represent more than 10% of accounts receivable as of October 1, 2021. 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 2021, 2020 and 2019, our top ten customers represented an aggregate of 49%, 61% and 54% of total revenue, respectively.

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 October 1, 2021. Based on this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of October 1, 2021.

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 October 1, 2021. In making this assessment, the company's management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated 2013 Framework.

Based on this assessment, our management concluded that, as of October 1, 2021, our internal control over financial reporting is effective based on those criteria.

The effectiveness of our internal control over financial reporting as of October 1, 2021 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 October 1, 2021 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 October 1, 2021, 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 October 1, 2021, 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 October 1, 2021, of the Company and our report dated November 15, 2021 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 15, 2021

ITEM 9B. OTHER INFORMATION.

None.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS.

Not applicable.

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 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days after October 1, 2021.

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 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days after October 1, 2021.

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 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days after October 1, 2021.

Equity Compensation Plan Information

We have two equity compensation plans under which shares are currently authorized for issuance, our 2021 Omnibus Incentive Plan (the “2021 Plan”) and our 2021 Employee Stock Purchase Plan. We also maintain our Amended and Restated 2009 Omnibus Stock Plan, our 2012 Omnibus Incentive Plan (the “2012 Plan”) and our 2012 Employee Stock Purchase Plan, however, no additional awards may be issued under these plans. Each of our aforementioned plans were approved by our stockholders. The following table provides information regarding securities authorized for issuance as of October 1, 2021 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))
Equity Compensation Plans Approved by Security Holders	205,000	$ 14.29	7,448,729
Equity Compensation Plans Not Approved by Security Holders	—	—	—
Total	205,000	$ 14.29	7,448,729

(1) Does not include 2,351,301 unvested shares outstanding as of October 1, 2021 in the form of restricted stock awards or restricted stock units under the 2021 Plan and 2012 Plan, which do not require the payment of any consideration by the recipients.

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 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days after October 1, 2021.

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 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days after October 1, 2021.

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 October 1, 2021 and October 2, 2020

Consolidated Statements of Operations for the Fiscal Years Ended October 1, 2021, October 2, 2020 and September 27, 2019

Consolidated Statements of Stockholders' Equity and Comprehensive (Loss) Income for the Fiscal Years Ended October 1, 2021, October 2, 2020 and September 27, 2019

Consolidated Statements of Cash Flows for the Fiscal Years October 1, 2021, October 2, 2020 and September 27, 2019

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.

Exhibit Number	Description
2.1	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).
2.2	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).
2.3	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).
3.1	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).
3.2	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).
4.1	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).
4.2	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).
4.3	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).
4.4	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).
4.5	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).
4.6	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).
4.7	Description of Securities of MACOM Technology Solutions Holdings, Inc. (incorporated by reference to Exhibit 4.7 to our Annual Report on Form 10-K filed on November 18, 2020).
4.8	Indenture, dated as of March 25, 2021, by and between MACOM Technology Solutions Holdings, Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.1 to our Current Report on Form 8-K filed on March 25, 2021).
4.9	Form of 0.250% Convertible Senior Note due 2026 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed on March 25, 2021).
10.1*	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).

10.2*	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).
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 and restated (incorporated by reference to Exhibit A to our Proxy Statement on Schedule 14A filed on January 19, 2016).
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 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).
10.10*	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).
10.11*	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).
10.12*	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).
10.13	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).
10.14	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).
10.15	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).
10.16	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).
10.17	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).
10.18	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).
10.19	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).
10.20	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).
10.21	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).

10.22	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).
10.23	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).
10.24	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).
10.25	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).
10.26*	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).
10.27*	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).
10.28*	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 10.37 to our Annual Report on Form 10-K filed on November 25, 2019).
10.29*	Form of Restricted Stock Unit Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan for employees in France (incorporated by reference to Exhibit 10.29 to our Annual Report on Form 10-K filed on November 18, 2020).
10.30*	Form of Restricted Stock Unit Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2012 Omnibus Incentive Plan for Canadian Participants (incorporated by reference to Exhibit 10.30 to our Annual Report on Form 10-K filed on November 18, 2020).
10.31*	MACOM Technology Solutions Holdings, Inc. 2021 Omnibus Incentive Plan (incorporated by reference to Exhibit A to our Proxy Statement on Schedule 14A filed on January 15, 2021).
10.32*	Form of Restricted Stock Unit Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2021 Omnibus Incentive Plan (Time-Based and Performance-Based) (incorporated by reference to Exhibit 10.2 to our Quarterly Report on Form 10-Q filed on April 29, 2021).
10.33*	Form of Restricted Stock Unit Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2021 Omnibus Incentive Plan (Time-Based for Non-Employee Directors) (incorporated by reference to Exhibit 10.3 to our Quarterly Report on Form 10-Q filed on April 29, 2021).
10.34*	Form of Restricted Stock Award Agreement under the MACOM Technology Solutions Holdings, Inc. 2021 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.4 to our Quarterly Report on Form 10-Q filed on April 29, 2021).
10.35*	MACOM Technology Solutions Holdings, Inc. 2021 Employee Stock Purchase Plan (incorporated by reference to Exhibit B to our Proxy Statement on Schedule 14A filed on January 15, 2021).
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 October 1, 2021, formatted in Inline XBRL: (i) Consolidated Balance Sheets, (ii) Consolidated Statements of Operations, (iii) Consolidated Statements of Comprehensive Income (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 October 1, 2021, 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 15, 2021

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 15, 2021.

Signature and Title

/s/ Stephen G. Daly
Stephen G. Daly
President and Chief Executive Officer
Director
(Principal Executive Officer)

/s/ John F. Kober
John F. 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 VanLunsen
Gil VanLunsen
Director

/s/ Charles Bland
Charles Bland
Director

/s/ Geoffrey Ribar
Geoffrey Ribar
Director

/s/ John Ritchie
John Ritchie
Director

SUBSIDIARIES OF THE REGISTRANT

Name	Jurisdiction of Incorporation
MACOM Technology Solutions Inc.	Delaware
Mindspeed Technologies, 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 India Private Limited	India
MACOM Technology Solutions (India) Private Limited	India

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statements No. 333-253887, No. 333-216406, No. 333-209610, No. 333-193098, and No. 333-180219 on Form S-8 and Registration Statement No. 333-188728 on Form S-3 of our reports dated November 15, 2021, relating to the 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 for the year ended October 1, 2021.

/s/ Deloitte & Touche LLP
Boston, Massachusetts
November 15, 2021

EXHIBIT 31.1

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: 11/15/2021

/s/ Stephen G. Daly
Stephen G. Daly
President and Chief Executive Officer

EXHIBIT 31.2

CERTIFICATION OF THE CFO PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, John F. 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: 11/15/2021

/s/ John F. Kober
John F. Kober
Senior Vice President and Chief Financial Officer

EXHIBIT 32.1

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 October 1, 2021 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 F. 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
11/15/2021

/s/ John F. Kober
John F. Kober
Senior Vice President and Chief Financial Officer

11/15/2021