LATTICE SEMICONDUCTOR CORP
Form 10-K
February 26, 2019
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UNITED STATES
SECURITIES AND
EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)

þ	ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE FISCAL YEAR ENDED DECEMBER 29, 2018
	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: 000-18032

LATTICE SEMICONDUCTOR CORPORATION
(Exact name of registrant as specified in its charter)

Delaware	93-0835214
(State of Incorporation)	(I.R.S. Employer Identification Number)

5555 NE Moore Court, Hillsboro, Oregon 97124-6421
(Address of principal executive offices) (Zip Code)
Registrant's telephone number, including area code: (503) 268-8000

_____

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

_____

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

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

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

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

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 þ 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 þ No ¨

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a 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. (Check one):

Large accelerated filer ¨	Accelerated filer þ	Non-accelerated filer ¨
Smaller reporting company ¨	Emerging growth company ¨	

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

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

Aggregate market value of voting stock held by non-affiliates of the registrant as of June 29, 2018	$575,075,952
Number of shares of common stock outstanding as of February 21, 2019	131,598,332

DOCUMENTS INCORPORATED BY REFERENCE

The information required by Part III of this Report, to the extent not set forth herein, is incorporated herein by reference from the registrant's definitive proxy statement relating to the 2019 Annual Meeting of Stockholders, which definitive proxy statement shall be filed with the Securities and Exchange Commission within 120 days after the end of the fiscal year to which this Report relates.

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ANNUAL REPORT ON FORM 10-K
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Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These involve estimates, assumptions, risks and uncertainties. Any statements about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. We use words or phrases such as “anticipates,” “believes,” “could,” “estimates,” “expects,” “intends,” “plans,” “predicts,” “projects,” “should,” “continue,” “ongoing,” “future,” “potential” and similar words or phrases to identify forward-looking statements.

Examples of forward-looking statements include, but are not limited to, statements about: our transitions to newly adopted accounting standards; the effect of new accounting standards on our consolidated financial statements and financial results; the effects of sales mix on our gross margin in the future; our judgments involved in revenue recognition; our strategies and beliefs regarding the markets in which we compete or may compete; our expectations regarding emerging trends and market opportunities, our expectations regarding market infrastructure and growth areas, our future investments in research and development and our product leadership; our expectations regarding cash provided by or used in operating activities; our expectations regarding royalties under collaborative agreements; our expectations regarding our ability to service our debt obligations; our expectations regarding restructuring charges under and timing of restructuring plans; our expectation regarding payment of foreign and U.S. federal income taxes; the sufficiency of our financial resources to meet our operating and working capital needs through at least the next 12 months; our intention to continually introduce new products and enhancements and reduce manufacturing costs; our expectation of production volumes and the associated revenue streams for certain mobile handset providers; our continued participation in or sources of revenue from standard setting initiatives or consortia that develop and promote the High-Definition Multimedia Interface ("HDMI") specification including our expectations regarding sharing of HDMI royalty revenues; our plans to continue to monetize our patent portfolio through sales of non-core patents; our beliefs regarding our disclosure controls and procedures; the adequacy of assembly and test capacity commitments; our expectations regarding taxes and tax adjustments, particularly with respect to the 2017 Tax Act; our expectations regarding the outcome of tax and other audits; our valuation allowance and uncertain tax positions; our beliefs regarding the adequacy of our liquidity, capital resources and facilities; our intention to sublease vacated leased space in San Jose, California and Portland, Oregon; our expectations regarding our implementation of a company-wide enterprise resource planning system; our beliefs regarding legal proceedings, and our expectations regarding the impact of sanctions imposed by the United States Department of Commerce.

Forward-looking statements involve estimates, assumptions, risks, and uncertainties that could cause actual results to differ materially from those expressed in the forward-looking statements. The key factors, among others, that could cause our actual results to differ materially from the forward-looking statements included global economic conditions and uncertainty, including as a result of trade related restrictions or tariffs, the concentration of our sales in certain end markets, particularly as it relates to the concentration of our sales in the Asia Pacific region, market acceptance and demand for our existing and new products, market and technology trends, our ability to license or sell our intellectual property, any disruption of our distribution channels, the impact of competitive products and pricing, unexpected charges, delays or results relating to our restructuring plans, unexpected complications with our implementation of a company-wide enterprise resource planning system, the effect of any downturn in the economy on capital markets and credit markets, unanticipated taxation requirements or positions of the U.S. Internal Revenue Service or other taxing authority, unanticipated effects of tax reform, or unexpected impacts of accounting guidance. In addition, actual results are subject to other risks and uncertainties that relate more broadly to our overall business, including those more fully described herein and that are otherwise described from time to time in our filings with the Securities and Exchange Commission, including but not limited to the items discussed in “Risk Factors” in Item 1A of Part I of this Annual Report on Form 10-K.

You should not unduly rely on forward-looking statements because our actual results could differ materially from those expressed in any forward-looking statements made by us. In addition, any forward-looking statement applies only as of the date on which it is made. We do not plan to, and undertake no obligation to, update any forward-looking statements to reflect events or circumstances that occur after the date on which such statements are made or to reflect the occurrence of unanticipated events.

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PART I

Item 1. Business

Overview

Lattice Semiconductor Corporation and its subsidiaries (“Lattice,” the “Company,” “we,” “us,” or “our”) develop semiconducto technologies that we monetize through products, solutions, design services, and licenses. We engage in smart connectivity, control, and compute solutions, providing intellectual property ("IP") and low-power, small form-factor programmable logic devices that enable global customers to quickly and easily develop innovative, smart, and connected products. We help their products become more aware, interact more intelligently, and make better and faster connections. In an increasingly intense global technology market, we help our customers get their products to market faster than their competitors. Our broad end-market exposure extends from mobile devices and consumer electronics to industrial and automotive equipment, communications and computing infrastructure, and licensing and services.

Our historic focus was on programmable logic devices ("PLDs"). In 2011, we made the strategic decision to competitively differentiate from other established programmable logic companies with ultra-low power and ultra-small sized field programmable gate array ("FPGA") solutions, a type of PLD. As a result, we acquired a leader in this technology, SiliconBlue Technologies, Inc. in 2011, and FPGA solutions and PLDs comprised our core business. In 2015, we broadened our product offerings by acquiring Silicon Image, Inc. (“Silicon Image”), a connectivity standards developer and semiconductor company. Over the past year we have re-focused more significantly on our core business of FPGA solutions and have divested various non-core assets and product lines acquired in our 2015 acquisition of Silicon Image.

Our FPGA devices provide us with a strong, growing base of control, connect, and compute technologies. We believe there are multiple growth areas that will allow us to increase our addressable market. In particular, we believe there are several emerging trends in servers, infrastructure, and smart devices that are opportunities for Lattice:

- With the growth of data centers, our “processor agnostic” solutions are ideal for control and connect functions in enterprise and data center server applications.
- With the expected continued communications infrastructure build-out from 5G deployment, Lattice solutions are being adopted to control and connect a variety of functions in critical systems.
- With the increase in electrification and the proliferation of sensors in smart factories and automobiles, our low power, small form factor solutions are ideal for everything from battery powered systems and sensor applications to video formats.
- With the increase in artificial intelligence and machine learning and a multitude of applications at the network edge, Lattice has the capabilities to provide solutions. These applications often act independently and need to make instantaneous decisions. As such, they need their own computing and learning capabilities to perform functions like face detection, image recognition, and video analytics – capabilities that we have today as a result of technology obtained with the acquisition of Silicon Image.

To serve these emerging needs, devices require high levels of processing power, speed, and memory, the need to operate with low power consumption, and the ability to integrate complex functionality into a highly compact footprint. These requirements align to the capabilities of our FPGA devices. Our flexible, low power, small form factor FPGAs put us in a unique position to meet these growing market needs.

Our Markets and Customers

We sell our products globally in three primary end markets groups: Mobile and Consumer, Communications and Computing, and Industrial and Automotive. We also provide Intellectual Property licensing and services to these end markets.

In the Mobile and Consumer Market, you can find our solutions making both consumer and prosumer products smarter and thinner, including: smart-phones, wearables, accessories such as chargers and docks, smart home devices, Virtual Reality ("VR") headsets, digital SLR cameras, drones, and other connected devices.

Our Mobile and Consumer customers are driven by the need to deliver richer and more responsive experiences. They typically require:

- More intelligence and computing power. Products need to be always-on and always-aware.
- Longer battery lives for handheld devices and reduced energy consumption for plugged-in devices.
- Real-time transmission of higher resolution video content on larger screen sizes.
- Fast design cycles. Products must be quickly and easily differentiated.
- Smaller form factors. Products need to lay flatter on the wall or fit more easily in people’s pockets.
- Various levels of video processing and analytics.

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Lattice solutions help solve these challenges with the following products and services:

- FPGAs bring multiple benefits to our customers. An FPGA's parallel architecture enables faster processing than competing devices, such as processors, allowing for a user experience with shorter pauses and fewer delays. Our FPGAs have among the lowest power consumption in the industry, enabling the application processor and other high power components to remain dormant longer, resulting in longer battery life. Finally, with some of the industry's smallest packages, we enable thinner end products.
- A full suite of standards-based HDMI Video Connectivity Application Specific Standard Products ("ASSPs") enable the immersive audio-visual experience that consumers demand.
- Intellectual Property Licensing and Services enable customers who wish to develop a proprietary solution to use our proven technology.

Our proprietary solutions help our customers get their products to market faster than typical development cycles. With re-programmability and flexibility, our FPGAs inherently allow our customers to have quicker product development. Our deep engagement with industry standards bodies gives us an intimate knowledge of various video technologies and enables our customers to accelerate their innovation. All of Lattice's solution time-to-market advantages are critical given shorter product life cycles and higher competition in our customers' end markets.

In the Communications and Computing Market, our solutions play key roles in computing systems such as servers and clients, heterogeneous network ("HetNet") small cell base stations, network backhaul, wired access aggregation, and other related applications.

Our Communications and Computing customers need to "connect anything to everything," at ever-increasing data rates.

- As data center servers become smaller and power costs become more dominant, there is a growing requirement for smaller form factors with lower installed and operational costs. Lattice's low cost per look-up table, and high Input-Output ("I/O") count enable customers to use fewer devices in much smaller spaces.
- Additionally, they need simplified control logic, enhanced security, and rigorous power and thermal management.
- Networks typically require progressively higher bandwidth and increased reliability as more data is demanded by consumer and other connected devices. Bandwidth demands are also driven by the rapid transition to a cloud-based infrastructure.
- As wireless cells become more compact without fans, there is a growing requirement for smaller form factors optimized for low power consumption.

We help customers solve these problems with the following products:

- FPGAs optimized for I/O expansion, low cost look-up tables, hardware acceleration, hardware management, and affordability. Our FPGAs consume power at very low rates, which reduces operating costs. Their small form factor enables higher functional density in less space. Finally, our FPGAs are I/O rich, which allows for more connections with system application specific integrated circuits ("ASICs") and ASSPs. Our programmable mixed signal devices make power and thermal management easy and reliable.

Examples of our products enabling intelligent automation in the Industrial and Automotive Market include machine vision, robotics, factory automation, industrial handhelds, surveillance cameras and DVRs, digital signage, driver assistance, automotive infotainment, servers, and data center networks.

Our Industrial and Automotive customers face numerous challenges:

- As smart factories develop, sensors are proliferating and machine vision is becoming higher definition, in turn requiring increasing amounts of data to be gathered, connected, and processed.
- Cars, trucks, and trains are also becoming smarter and more connected. Drivers and passengers are demanding better in-cabin experiences including entertainment, diagnostics, and enhanced safety — often involving multiple displays, cameras, and sensors.

- As factories and automotive manufacturers continue their evolution of computerization, power reduction, faster time to design in and market, lower costs are becoming increasingly normal.

Our product portfolio helps solve these challenges. Our small-sized, low-power FPGAs not only provide the I/O expansion, bridging, connectivity, and processing inherent in FPGAs to the full Industrial Market, but they also form the backbone of several integrated solutions, including complete HD camera and DVR solutions on a single FPGA device and Human-Machine Interfaces (HMI) on a chip.

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Our Products, Services, and Competition

We deliver two types of semiconductor devices to help solve our customers' problems: FPGAs and Video Connectivity ASSPs. We also serve our customers with IP licensing and various other services.

Field Programmable Gate Arrays (“FPGAs”)

FPGAs are regular arrays of logic that can be custom-configured by the user through software. This programmability allows our customers flexibility and reduced time to market while allowing us to offer the chips to many different customers in many different markets. Five product family lines anchor our FPGA offerings:

- The ECP families are our “Connectivity & Acceleration FPGAs.” They offer customers the lowest cost per gate, Digital Signal Processing ("DSP") capability, and Serialize-Deserialize ("SerDes") connectivity. ECP devices are optimized for the Communications and Computing market but also find significant use in the Industrial and Automotive market.
- The MachXO families are known as “Bridging and Expansion FPGAs.” They are control oriented and offer the lowest cost per I/O, along with the lowest cost per look-up table. MachXO families are widely used across our three primary target markets: Communications and Computing, Industrial and Automotive, and Mobile and Consumer.
- iCE40 families are known as the “World’s Smallest FPGAs.” Their small size and ultra-low power make them the optimal products for customizing Consumer mobile and Industrial handheld products. The iCE40 UltraLite was named “Digital Semiconductor Product of the Year” by the 2015 Elektra European Electronics Industry Awards. In 2016, we released the latest member of the family, iCE40 UltraPlus, focused on smart-phone and Internet of things ("IoT") edge devices.
- CrossLink was introduced in 2016 as the world’s first video “pASSP” (programmable Application Specific Standard Part). CrossLink combines the power and speed benefits of hardened video camera and display bridging cores with the flexibility of FPGA fabric. CrossLink was the 2016 recipient of the “Editor’s Choice Award” by EEPW magazine.
- Programmable Mixed Signal devices, such as our Platform Manager 2 and L-ASC10 combine programmable digital logic with analog functionality to help customers manage power, thermal, and control planes in real time.

To enable our customers to get to market faster we support the FPGAs with intellectual property cores, reference designs, development kits, and design software.

Competition for our FPGAs is fragmented:

- While ASICs, ASSPs, and microcontrollers have historically dominated high-volume market segments through low cost and reduced power consumption, our FPGAs have become small enough with sufficiently low power consumption that we are now considered by customers in use cases where they need the architectural benefits of FPGAs, namely programmability with its accelerated time-to-market and the speed that comes from parallelism. Not only can customers use FPGAs to add new features and support new standards, but if a customer’s design is not working as intended, the customer can quickly change it using the programmability of our FPGAs through software. In contrast, ASICs and ASSPs require time consuming and expensive redesign and fabrication. Against microcontrollers, we differentiate our products with smaller sized packages and higher performance.
- Our main FPGA competitors are Xilinx and Intel. Both make FPGAs that are generally focused on the high-density end of the market, making devices that are up to a full order of magnitude larger than ours with the associated increases in power and size. We differentiate from them with ultra-low power and very small sized packages.

Video Connectivity Application Specific Standard Products ("ASSPs")

In the Mobile and Consumer market, consumers need to connect many different types of audio-video devices and expect them to work seamlessly together. We refer to these connections as “Video Connectivity.” Industry standards, such as HDMI, and USB Type-C, ensure that consumers are able to successfully make those connections. These industry standards support resolutions up to 8K, High Dynamic Range, Deep Color, and HDCP 2.2 content protection.

Our Video Connectivity ASSPs implement these standards along with value-added features and allow consumer original equipment manufacturers ("OEMs") to quickly get feature rich and interoperable products to market.

Our Video Connectivity ASSPs perform many functions, including ensuring interoperability, enhancing picture quality, converting between resolutions, and transmitting / receiving content without the need for additional components. Specific device types include port processors, port controllers, video processors, transmitters, receivers, bridges, and converters. These devices are used in products such as mobile phones, UHD TVs, home theater systems, HDMI cable extenders, automotive infotainment, PCs, video accessories, projectors, and monitors.

In general, our Video Connectivity competition includes:

- HDMI functionality offered in either discrete devices or integrated into system-on-a-chip products. These are offered by a small number of companies.
- In-house semiconductor solutions designed by large consumer electronics OEMs.
- Alternative HD connectivity technologies such as DisplayPort and MiraCast, which are offered by select companies.

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We believe that we have a competitive advantage because of our deep engagement with industry standards bodies. This involvement has enabled us to bring our “standards plus” products and IP to market more quickly and gives our customers confidence that we have the expertise needed to successfully execute.

Intellectual Property (IP) Licensing and Services

Lattice has a broad set of technological capabilities and many U.S. and international patents. We generate revenue from our technology portfolio via upfront fees and on-going royalty payments through the following activities:

- Standard IP Licensing - these activities include our participation in two consortia for the licensing of HDMI and MHL technologies to customers who adopt the technology into their products and voluntarily report their usage and royalties. The royalties are split between consortium members, including us.
- IP Core Licensing - some customers need Lattice’s technology for specific functions or features, but for various reasons are not able to use our silicon solutions. In those cases, we may license them IP cores, which they can integrate into their own ASICs. In contrast to the use of consortia, these licensing activities are generally performed internally.
- Patent Monetization - we sell certain patents from our portfolio generally for technology that we are no longer actively developing. The revenue from these sales generally consists of upfront payments and potential future royalties.
- IP Services - projects and design services for customers who wish to develop specific solutions that harness our proven technology and expertise.

Research and Development

We place a substantial emphasis on new product development, where return on investment is the key driver, and believe that continued investment in research and development is required to maintain and improve our competitive position. Our product development activities emphasize new proprietary products, advanced packaging, enhancement of existing products and process technologies, improvement of software development tools, development of innovative technology standards, and enhanced services. Research and development activities occur primarily in Hillsboro, Oregon; San Jose, California; Shanghai, China; and Muntinlupa City, Philippines.

We believe that a continued commitment to research and development is essential to maintaining product leadership and providing innovative new product offerings and, therefore, we expect to continue to make significant future investments in research and development.

Operations

We do not manufacture our own silicon products. We maintain strategic relationships with large, established semiconductor foundries to source our finished silicon wafers. This strategy allows us to focus our internal resources on product and market development, and eliminates the fixed cost of owning and operating semiconductor manufacturing facilities. We are able to take advantage of the ongoing advanced process technology development efforts of semiconductor foundries, and to choose to apply those technologies when they become most economically beneficial to us and to our customers.

Lattice and Fujitsu Limited ("Fujitsu") have entered into agreements pursuant to which Fujitsu manufactures our next generation products on its 130nm, 90nm and 65nm CMOS process technologies, as well as embedded flash memory in these technical nodes. United Microelectronics Corporation ("UMC") manufactures certain of our next generation 40nm products. Taiwan Semiconductor Manufacturing Company Ltd. (“TSMC”) manufactures our acquired SiliconBlue and Silicon Image products. Seiko Epson ("Epson") manufactures our 500nm, 350nm, 250nm and 180nm products.

All of our assembly and volume test operations are performed by outside suppliers. We perform certain test operations as well as reliability and quality assurance processes internally. We have achieved and maintained ISO9001:2015 Quality Management Systems Certification and released a line of products qualified to the AEC-Q100 Reliability Standard.

We rely on third party vendors to provide cost-effective and efficient supply chain services. Among other activities, these outsourced services relate to direct sales logistics, including order fulfillment, inventory management and warehousing, and shipment of inventory to third party distributors.

Wafer Fabrication

We source silicon wafers from our foundry partners, Fujitsu and Epson in Japan, and TSMC and UMC in Taiwan, pursuant to agreements with each company and their respective affiliates. We negotiate wafer volumes, prices and other terms with our foundry partners and their respective affiliates on a periodic basis.

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Assembly

After wafer fabrication and initial testing, we ship wafers to independent subcontractors for assembly. During assembly, wafers are separated into individual die and encapsulated in plastic packages. We have qualified two major assembly partners, Advanced Semiconductor Engineering ("ASE") and Amkor Technology ("Amkor') and are second sourced where volume and customer requirements are necessary. All ASE and Amkor manufacturing of our products is in Asia. We negotiate assembly prices, volumes and other terms with our assembly partners and their respective affiliates on a periodic basis.

We currently offer an extensive list of standard products in lead (Pb) free packaging. Our lead-free products meet the European Parliament Directive entitled "Restrictions on the use of Hazardous Substances" ("RoHS"). A select and growing subset of our ROHS compliant products are also offered with a "Halogen Free" material set.

Testing (Sort and Final Test)

We electrically sort test the die on most wafers prior to shipment for assembly. Wafer sort testing is primarily performed by Amkor in Japan and our second source King Yuan Electronics Co. (“KYEC”) in Taiwan. Some legacy products are tested at Unisem Group in Indonesia.

Following assembly, but prior to customer shipment, each product undergoes final testing and quality assurance procedures. Final testing is performed by ASE and Amkor, our assembly partners in Asia.

Sales and Revenue

We generate revenue by monetizing our technology and patents using two go-to-market strategies:

- Product and Technology Sales: Involves direct and channel sales of silicon-based products with their associated software solutions and services.
- Intellectual Property Licensing and Services: Involves the licensing or sale of intellectual property that we have developed, some of which we use in our products, and certain design services that we may provide.

Seasonality

While we periodically may experience some seasonal trends in the sale of our products, general economic conditions and the cyclical nature of the end markets we serve generally have a greater impact on our business and financial results than seasonal trends.

Backlog

Our backlog consists of orders from distributors and certain OEMs that require delivery within the next year. Historically, our backlog has not been a predictor of future sales or customer demand for the following reasons:

- Purchase orders, consistent with common industry practices, can generally be revised or canceled up to 30 days before the scheduled delivery date without significant penalty.
- Our backlog for distributors is valued at list price, which in most cases is substantially higher than the prices ultimately recognized as revenue.
- A sizable portion of our revenue comes from our "turns business," where the product is ordered and delivered within the same quarter.

A portion of our revenue arises from vendor-managed inventory arrangements where the timing and volume of customer utilization is difficult to predict.

Sales and Customers

We primarily sell our products to end customers from Lattice Semiconductor Corporation or our wholly-owned subsidiary, Lattice SG Pte. Ltd. We sell both directly and through a network of independent manufacturers' representatives. Additionally, we sell indirectly through independent distributors. We also employ a direct sales management and field applications engineering organization to support our end customers and indirect sales resources. Our end customers are primarily original equipment manufacturers ("OEMs") in the Communications and Computing, Mobile and Consumer, and Industrial and Automotive end markets.

We have agreements with 20 manufacturers' representatives in North America. We have established sales channels in over 44 foreign countries and maintain a network of 10 international sales representatives. A substantial portion of our sales are made through distributors.

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We provide global technical support to our end customers with engineering staff based at our headquarters, product development centers and selected field sales offices. We maintain numerous domestic and international field sales offices in major metropolitan areas.

Resale of product by distributors accounted for approximately 83% of our net revenue in fiscal 2018, approximately 77% of our net revenue in fiscal 2017, and approximately 73% of our net revenue in fiscal 2016. We expect our distributors to generate a significant portion of our revenue in the future. We depend on our distributors to sell our products to end customers, complete order fulfillment, and maintain sufficient inventory of our products. Our distributors also provide technical support and other value-added services to our end customers. We have two global distributors. We also have regional distribution in Asia, Japan, Israel, and North America, and we sell through three major on-line distributors.

In fiscal years 2018, 2017, and 2016, our revenue was broadly distributed across end markets and end customers, with no individual end customer accounting for more than 10% of the total revenue.

Revenue from foreign sales as a percentage of total revenue was 90%, 87%, and 88%, for fiscal 2018, 2017, and 2016, respectively. We assign revenue to geographies based on ship-to location of the end customer, where available, and based upon the location of the distributor to which the product was shipped otherwise (see "Geographic Information" in Note 21 - Segment and Geographic Information to our Consolidated Financial Statements in Part II, Item 8). Both foreign and domestic sales are denominated in U.S. dollars.

Intellectual Property, Patents, and Licensing

Intellectual Property

We seek to protect our products and technologies primarily through patents, trade secrecy measures, copyrights, mask work protection, trademark registrations, licensing restrictions, confidentiality agreements and other approaches designed to protect proprietary information. There can be no assurance that others may not independently develop competitive technology not covered by our intellectual property rights or that measures we take to protect our technology will be effective.

Patents

We hold numerous United States and international patents and have patent applications pending in the United States and internationally. Our current patents will expire at various times between 2019 and 2037, subject to our payment of periodic maintenance fees. There can be no assurance that pending or future patent applications will result in issued patents, or that any issued patents will survive challenges to their validity. Although we believe that our patents have value, there can be no assurance that our patents, or any additional patents that may be issued in the future, will provide meaningful protection from competition. We believe that our success will depend primarily upon the technical expertise, experience, and creativity, and the sales and marketing abilities of our personnel.

Patent and other proprietary rights infringement claims are common in our industry. There can be no assurance that, with respect to any claim made against us, we would be able to successfully defend against the claim or that we could obtain a license that would allow us to use the proprietary rights on terms or under conditions that would not harm our business.

Licenses

We have acquired various licenses from third parties to certain technologies that are implemented in IP cores or embedded in our products. Those licenses support our continuing ability to make and sell these products to our customers. While our various licenses are important to our success, we believe our business as a whole is not materially dependent on any particular license, or group of licenses.

Our Team

As of December 29, 2018, we had 754 full-time employees worldwide. We believe that our future success will depend, in part, on our ability to continue to attract and retain highly skilled technical, sales, and management personnel. None of our employees are represented by a collective bargaining agreement. We have never experienced any work stoppages and consider our employee relations to be good.

Corporate Background

Lattice was incorporated in Oregon in 1983 and reincorporated in Delaware in 1985. In the first quarter of 2019, we relocated our corporate headquarters to our facility at 5555 NE Moore Court, Hillsboro, Oregon 97124. Our website is www.latticesemi.com. Information contained or referenced on our website is not incorporated by reference into, and does not form a part of, this Annual Report on Form 10-K. Our common stock trades on the NASDAQ Global Select Market under the symbol LSCC.

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Reporting Calendar

We report based on a 52 or 53-week fiscal year ending on the Saturday closest to December 31. Our fiscal 2018, 2017, and 2016 were 52-week years that ended December 29, 2018, December 30, 2017, and December 31, 2016, respectively. Our fiscal 2019 will be a 52-week year and will end on December 28, 2019. All references to quarterly or yearly financial results are references to the results for the relevant fiscal period.

Available Information

We make available, free of charge through the Investor Relations section of our website at www.latticesemi.com, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy statements and amendments to those reports and statements as soon as reasonably practicable after such materials are electronically filed with, or furnished to, the SEC. You may also obtain free copies of these materials by contacting our Investor Relations Department at 5555 NE Moore Court, Hillsboro, Oregon 97124, telephone (503) 268-8000. Our SEC filings are also available at the SEC's website at www.sec.gov. The content on any website referred to in this filing is not incorporated by reference into this filing unless expressly noted otherwise.

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ITEM 1A. Risk Factors

The following risk factors and other information included in this Annual Report should be carefully considered before making an investment decision relating to our common stock. If any of the risks described below occur, our business, financial condition, operating results and cash flows could be materially adversely affected. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations and financial results.

We rely on a concentrated number of subcontractors to supply and fabricate silicon wafers for our semiconductor products. If they are unable to do so on a timely and cost-effective basis in sufficient quantities and using competitive technologies, we may incur significant costs or delays.

We rely on a concentrated number of independent foundries in Asia to supply and fabricate silicon wafers for our semiconductor products, including Fujitsu, United Microelectronics Corporation, Taiwan Semiconductor Manufacturing, and Seiko Epson. Our success is dependent upon our ability to successfully partner with our foundry partners and their ability to produce wafers with competitive performance attributes and prices. Establishing, maintaining and managing multiple foundry relationships requires the investment of management resources as well as costs. If we fail to maintain our foundry relationships, if our foundry partners do not provide facilities and support for our development efforts, or if we elect or are required to change foundries, we may incur significant costs and delays. If our foundry partners are unable to, or do not, manufacture sufficient quantities of our products at acceptable yields, we may be required to allocate the affected products among our customers, prematurely limit or discontinue the sales of certain products, or incur significant costs to transfer products to other foundries, which could adversely affect our customer relationships and operating results.

Any adverse change in our relationship with our distributors or our distributors' performance could harm our sales.

We depend on a concentrated group of distributors to sell our products to end customers, complete order fulfillment, and maintain sufficient inventory of our products. Our distributors also provide technical support and other value-added services to our end customers. In fiscal 2018, revenue attributable to distributors accounted for 83% of our total revenue, with two distributors accounting for 54% of total revenue. In fiscal 2017, distributors accounted for 77% of our total revenue with two distributors accounting for 51% of total revenue. We have significant outstanding receivables with our top distributors, and expect our distributors to generate a significant portion of our revenue in the future. Any adverse change to our relationships with our distributors or a failure by one or more of our distributors to perform its obligations to us could have a material impact on our business. A significant reduction of effort by a distributor to sell our products, a material change in our relationship with one or more distributors, or a reduction in the financial health of our distributors may result in the inability of distributors to effectively perform services on our behalf or pay receivables, reduce our access to certain end customers, or adversely affect our ability to sell our products.

Our success and future revenue depends on our ability to develop and introduce new products that achieve customer and market acceptance.

We compete in a dynamic environment characterized by rapid technology and product evolution, generally followed by a relatively longer process of ramping up to volume production on advanced technologies. Our markets are also characterized by evolving industry standards, frequent new product introduction, short product life cycles, and increased demand for higher levels of integration and smaller process geometry. Our competitive position and success depends on our ability to innovate, develop, and introduce new products that compete effectively on the basis of price, density, functionality, power consumption, form factor, and performance, and our addressing the evolving needs of the markets we serve. These new products typically are more technologically complex than their predecessors. In

addition, we expect revenue related to mature products to decline over time in a normal product life cycle. As a result, we may be increasingly dependent on revenue derived from our newer products.

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Our future growth and the success of new product introductions depend upon numerous factors, including:

- timely completion and introduction of new product designs;
- ability to generate new design opportunities and design wins, including those which result in sales of significant volume;
- achievement of necessary volume of production to achieve acceptable cost;
- availability of specialized field application engineering resources supporting demand creation and customer adoption of new products;
- ability to utilize advanced manufacturing process technologies;
- achieving acceptable yields and obtaining adequate production capacity from our wafer foundries and assembly and test subcontractors;
- ability to obtain advanced packaging;
- availability of supporting software design tools;
- utilization of predefined IP logic;
- market acceptance of our HDMI-enabled and mobile products;
- customer acceptance of advanced features in our new products;
- availability of competing alternative technologies; and
- market acceptance of our customers' products.

The failure of any of these factors, among others, could adversely affect our product innovation, development and introduction efforts and our financial condition and results of operations.

Our global business operations expose us to various economic, legal, regulatory, political, and business risks.

We have significant international operations, including foreign sales offices to support our international customers and distributors, which account for the majority of our revenue, and operational and research and development sites in China, the Philippines, and other Asian locations. In addition, we purchase our wafers from foreign foundries; have our commercial products assembled, packaged, and tested by subcontractors located outside of the United States; and rely on an international service provider for inventory management, order fulfillment, and direct sales logistics.

These and other integral business activities outside of the United States are subject to the operational challenges, risks and uncertainties associated with conducting business in foreign economic and regulatory environments including trade barriers; political instability, acts of war or terrorism, natural disasters, economic sanctions; weak economic conditions, environmental regulations; labor regulations; import and export regulations; tax or freight rates, duties; trade restrictions; interruptions in transportation or infrastructure, changes in trade policies; anti-corruption laws; domestic and foreign governmental regulations; potential vulnerability of and reduced protection for intellectual property; disruptions or delays in production or shipments; and instability or fluctuations in currency exchange rates, any of which could have a material adverse effect on the operations of one of our international customers, distributors or service providers and could adversely affect our business, financial condition, and operating results.

If we fail to comply with the many laws and regulations to which we are subject, we may be subject to significant fines, penalties or liabilities for noncompliance, which could harm our business and financial results. For example, effective May 2018, the European Union adopted the General Data Protection Regulation (“GDPR”), which established new requirements regarding the handling of personal data and non-compliance monetary penalties of up to the higher of 20 million Euros or 4% of worldwide revenue. Any inability or perceived inability to adequately comply with applicable laws or regulations, including GDPR, could result in additional cost and liability to our business and could adversely affect our financial condition and results of operations.

Moreover, our financial condition and results of operations could be affected in the event of political instability, including as a result of terrorist activity, U.S. or other military actions, actions against our customers, the United Kingdom referendum in June 2016 (commonly referred to as "Brexit"), or economic crises in countries where our main wafer suppliers, end customers, contract manufacturers, and logistics providers are located.

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The semiconductor industry routinely experiences cyclical market patterns and a significant industry downturn could adversely affect our operating results.

Our revenue and gross margin can fluctuate significantly due to downturns in the highly cyclical semiconductor industry. These downturns can be severe and prolonged and can result in price erosion and weak demand for our products. Weak demand for our products resulting from general economic conditions affecting the end markets we serve or the semiconductor industry specifically and reduced spending by our customers can result, and in the past has resulted, in diminished product demand, high inventory levels, erosion of average prices, excess and obsolete inventories and corresponding inventory write-downs. Our expense levels are based, in part, on our expectations of future sales. Many of our expenses, particularly those relating to facilities, capital equipment, and other overhead, are relatively fixed. We might be unable to reduce spending quickly enough to compensate for reductions in sales. Accordingly, shortfalls in sales could adversely affect our operating results. Furthermore, any significant upturn in the semiconductor industry could result in increased competition for access to raw materials and third-party service providers. The dynamics of the markets in which we operate make prediction of and timely reaction to such events difficult. Due to these and other factors, our past results are not reliable predictors of our future results and cyclical changes in the semiconductor industry could adversely affect our operating results.

General economic conditions and deterioration in the global business environment could have a material adverse effect on our business, operating results, and financial condition.

Adverse economic conditions or our customers' perceptions of the economic environment may negatively affect customer demand for our products and services and result in delayed or decreased spending. Several factors contribute to these weak economic conditions, including volatility in the financial markets, lower levels of consumer liquidity, higher interest rates, price increases for materials and components, and political uncertainty. Weak global economic conditions in the past have resulted in weak demand for our products in certain geographies and had an adverse impact on our results of operations. If global economic conditions weaken, our business could be harmed due to customers or potential customers reducing or delaying orders. In addition, the inability of customers to obtain credit, the insolvency of one or more customers, tariffs applicable to our customers' products, or the insolvency of key suppliers could result in sales or production delays. Any of these effects could impact our ability to effectively manage inventory levels and collect receivables, require additional restructuring actions, and decrease our revenue and profitability. Uncertainty about future economic conditions makes it difficult for us to forecast operating results and to make decisions about future investments. Any or all of these factors could adversely affect our financial condition and results of operations in the future.

Our business depends on the proper functioning of internal processes and information technology systems, and failure of these processes and systems may cause business disruptions.

We rely on various information technology ("IT") networks and systems to manage our operations, including financial reporting, and we regularly make changes to improve them as necessary by periodically implementing new, or upgrading or enhancing existing, operational and IT systems, procedures, and controls. These systems are supported by subcontractors, and they may also be subject to power and telecommunication outages or other general system failures. The legal, regulatory and contractual environment surrounding information security and data privacy is complex and evolving. We have recently undergone a significant integration and systems implementation that included implementation of a new enterprise resource planning ("ERP") system to standardize our processes worldwide and adopt best-in-class capabilities. We committed significant resources to this new ERP system, which replaced multiple legacy systems. We are focused on realizing the full analytical functionality of this conversion, which is extremely complex, in part, because of the wide range of processes that must be integrated.

During our use of the new ERP system and our other information technology systems, we may experience delays or disruptions in the integration of our new or enhanced systems, procedures, or controls. The policies and security measures established with our new ERP system and other information technology systems may be vulnerable to data breaches, cyber-attacks or fraud. We may also encounter errors in data, an inability to accurately process or record transactions, and security or technical reliability issues. All of these could harm our ability to conduct core operating functions such as processing invoices, shipping and receiving, recording and reporting financial and management information on a timely and accurate basis, and could impact our internal control compliance efforts. If the technical solution or end user training are inadequate, it could limit our ability to manufacture and ship products as planned. We have various systems that remain that may be nearing the end of their useful life or vendor support, which will ultimately need to be replaced. Failure of our IT systems or difficulties or delays in maintaining, managing, and integrating them could adversely affect the Company’s controls and procedures and could impact the Company's ability to perform necessary operations, which could materially adversely affect our business.

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Data breaches and cyber-attacks and cyber-fraud could compromise our intellectual property or other sensitive information or result in losses.

We maintain sensitive data on our networks and the networks of our business partners and third-party providers, including proprietary and confidential information relating to our intellectual property, personnel, and business, and that of our customers and third-party providers. We believe that companies have been increasingly subject to a wide variety of security incidents, cyber-attacks, hacking, phishing, and other attempts to gain unauthorized access or engage in fraudulent behavior. Cyber-attacks have become more prevalent, sophisticated and much harder to detect and defend against and it is often difficult to anticipate or detect such incidents and to assess the damage caused by them. Our policies and security measures cannot guarantee security, and our information technology infrastructure, including our networks and systems, may be vulnerable to data breaches, cyber-attacks or fraud. In the past, third parties have attempted to penetrate and/or infect our network and systems with malicious software and phishing attacks in an effort to gain access to our network and systems. In addition, we are subject to the risk of third parties falsifying invoices and similar fraud, frequently by obtaining unauthorized access to our vendors' and business partners' networks.

In some circumstances, we may partner with third-party providers and provide them with certain sensitive data. If these third parties fail to adopt or adhere to adequate data security practices, or in the event of a breach of their networks, this sensitive data may be improperly accessed, used or disclosed. These data breaches and any unauthorized access or disclosure of sensitive data could compromise our intellectual property, expose sensitive business information and subject us to third party claims.

The increase in cyber-attacks has resulted in an increased focus on cybersecurity by certain government agencies. Cyber-attacks or any investigation or enforcement action related to cybersecurity could cause us to incur significant remediation costs, result in product development delays, disrupt key business operations, and divert attention of management and key information technology resources. In addition, we may incur loss as a result of cyber-fraud, such as those experienced by other companies by making unauthorized payments irrespective of robust internal controls.

Our reputation, brand, and business could be significantly harmed, and we could be subject to third-party claims or governmental penalties in the event of such a security breach.

Our outstanding indebtedness could reduce our strategic flexibility and liquidity and may have other adverse effects on our results of operations.

As of December 29, 2018, we had approximately $263.0 million outstanding under a Credit Agreement, dated March 10, 2015 (the "Credit Agreement"). Our obligations under the Credit Agreement are guaranteed by our U.S. subsidiaries, and include a requirement to pay quarterly installments of approximately $0.9 million and up to 75% of our annual excess cash flow toward repayment of the facility, with the remaining balance due upon maturity in March 2021. Our ability to meet our debt service obligations depends upon our operating and financial performance, which is subject to general economic and competitive conditions and to financial, business and other factors affecting our operations, many of which are beyond our control. If we are unable to service our debt, we may need to sell material assets, restructure or refinance our debt, or seek additional equity capital. Prevailing economic conditions and global credit markets could adversely impact our ability to sell material assets, restructure or refinance our debt on terms acceptable to us, or at all, or we may not be able to restructure or refinance our debt without incurring significant additional fees and expenses.

The Credit Agreement also contains restrictive covenants, including limitations on liens, mergers and consolidations, sales of assets, payment of dividends, and additional indebtedness. The amount and terms of our indebtedness, as well as our credit rating, could have important consequences, including the following:

- we may be more vulnerable to economic downturns, less able to withstand competitive pressures, and less flexible in responding to changing business and economic conditions;
- our cash flow from operations may be allocated to the payment of outstanding indebtedness, and not to research and development, operations or business growth;
- we might not 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 ability to make distributions to our stockholders in a sale or liquidation may be limited until any balance on the facility is repaid in full; and
- our ability to incur additional debt, including for working capital, acquisitions, or other needs, is more limited.

If we breach a loan covenant, the lenders could accelerate the repayment of the facility. We might not have sufficient assets to repay our indebtedness upon acceleration. If we are unable to repay or refinance the indebtedness upon acceleration or at maturity, the lenders could initiate a bankruptcy proceeding against us or collection proceedings with respect to our assets and subsidiaries securing the facility, which could materially decrease the value of our common stock.

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We depend on a concentrated group of end customers for a significant portion of our revenues. If any of these end customers reduce their use of our products, our revenue could decrease significantly.

A significant portion of our revenue depends on sales to a concentrated number of customers. In fiscal 2018, even though no individual end customer accounted for more than 10% of our total revenue, our top five end customers accounted for approximately 18% of our total revenue. If our relationships with any material customers were to diminish, if these customers were to develop their own solutions or adopt alternative solutions or competitors' solutions, if any one or more of our concentrated groups of customers were to experience significantly adverse financial conditions, or if as a result of trade disputes or sanctions these customers were restricted from purchasing our products, our results could be adversely affected.

In addition, our customer's continued use of our products is frequently reevaluated, as certain of our customers' product life cycles are relatively short and they continually develop new products. The selection process for our products to be included in our customers' new products is highly competitive. There are no guarantees that our products will be included in the next generation of products introduced by these customers.

We may be unable to successfully develop and produce products on smaller geometries.

To remain competitive, we expect to continue to transition our semiconductor products to increasingly smaller nanometer geometries. Continual transition requires new and changes to existing manufacturing process technologies, which could have significantly higher mask and prototyping costs, as well as additional expenditures for engineering design tools. We may determine that we cannot transition on a cost-effective basis; and therefore not offer a competitive product.

In addition to costs, we depend on our relationships with our foundry partners to transition to smaller geometry processes successfully. Our foundry partners are limited by their existing obligations and technological capabilities. We make no assurance that our foundry partners would be able to effectively manage a transition of our products to smaller nanometer geometries in a timely manner, or at all. If we or any of our foundry partners experience significant delays in or fail to efficiently implement a transition to smaller process geometries, we could experience reduced manufacturing yields, delays in product deliveries, and increased expenses, all of which could adversely affect our relationships with our customers and our financial condition and operating results.

Our business could suffer as a result of tariffs and trade sanctions or similar actions.

The imposition by the United States of tariffs, sanctions or other restrictions on goods imported from outside of the United States or countermeasures imposed in response to such government actions could adversely affect our operations or our ability to sell our products globally, which could adversely affect our operating results and financial condition. In 2018, the President of the United States signed an order to impose a tariff on imports from certain countries, including China. The materials subject to these tariffs may impact the cost of raw materials used by our suppliers or in our customers’ products. The imposition of further tariffs by the United States on a broader range of imports, or further retaliatory trade measures taken in response to additional tariffs, could increase costs in our supply chain or reduce demand of our customers’ products, either of which could adversely affect our results of operations.

Our customers or suppliers could also become subject to U.S. regulatory scrutiny or export restrictions. For example, the United States Department of Commerce imposed sanctions on one of our customers in China in 2018, which prevented us from doing business with them until the sanctions were lifted. The U.S. Justice Department filed criminal charges against another of our customers in China and has otherwise taken a negative tone to perceived business practices by this customer and others in China. Revenue from distributors and end customers in China represented approximately 51% of our total revenue in 2018. Future sanctions similar to those imposed in the past could adversely

affect our ability to earn revenue from these and similar customers. We cannot predict what impact these and future actions, sanctions or criminal charges could have on our customers or suppliers, and therefore our business. If any of our other customers or suppliers become subject to sanctions or other regulatory scrutiny, or if our customers are affected by tariffs or other government trade restrictions, our business and financial condition could be adversely affected.

We compete against companies that have significantly greater resources than us and numerous other product solutions.

The semiconductor industry is highly competitive and many of our direct and indirect competitors have substantially greater financial, technological, manufacturing, marketing, and sales resources. Consolidation in our industry may increasingly mean that our competitors have greater consolidated resources, or other synergies, that could put us at a competitive disadvantage. We currently compete directly with companies that have licensed our technology or have developed similar products, as well as numerous semiconductor companies that offer products based on alternative solutions, such as applications processor, application specific standard product, microcontroller, analog, and digital signal processing technologies. Competition from these semiconductor companies may intensify as we offer more products in any of our end markets. These competitors include established, multinational semiconductor companies, as well as emerging companies.

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The intellectual property licensing component of our business strategy increases our business risk and fluctuation of our revenue and margins.

Our business strategy includes licensing our intellectual property to companies that incorporate it into their technologies that address multiple markets, including markets where we participate and compete. Our Licensing and services revenue may be impacted by the introduction of new technologies by customers in place of the technologies we license, changes in the law that may weaken our ability to prevent the use of our patented technology by others, the expiration of our patents, and changes of demand or selling prices for products using licensed patents. We cannot assure that our licensing customers will continue to license our technology on commercially favorable terms or at all, or that these customers will introduce and sell products incorporating our technology, accurately report royalties owed to us, pay agreed upon royalties, honor agreed upon market restrictions, or maintain the confidentiality of our proprietary information, or will not infringe upon or misappropriate our intellectual property. Our intellectual property licensing agreements are complex and may depend upon many factors that require significant judgments, including completion of milestones, allocation of values to delivered items and customer acceptance.

Our sale of patents and intermittent significant licensing transactions can cause material fluctuations in our revenue and gross margins.

We have generated revenue from the sale of certain patents from our portfolio, generally for non-core technology that we are no longer actively developing. While we plan to continue to monetize our patent portfolio through sales of non-core patents, we may not be able to realize adequate interest or prices for those patents. Accordingly, we cannot provide assurance that we will continue to generate revenue from these sales. In addition, although we seek to be strategic in our decisions to sell patents, we might incur reputational harm if a purchaser of our patents sues one of our customers for infringement of the purchased patent, and we might later decide to enter a space that requires the use of one or more of the patents we sold. In addition, as we sell groups of patents, we no longer have the opportunity to further sell or to license those patents and receive a continuing royalty stream.

Our Licensing and services revenue fluctuates, sometimes significantly, from period to period because it is heavily dependent on a few key transactions being completed in a given period, the timing of which is difficult to predict and may not match our expectations. Because of its high margin, the Licensing and services revenue portion of our overall revenue can have a disproportionate impact on gross profit and profitability. In addition, generating revenue from patent sales and intellectual property licenses is a lengthy and complex process that may last beyond the period in which our efforts begin, and the accounting rules governing the recognition of revenue from patent sales and intellectual property licensing transactions are increasingly complex and subject to interpretation. As a result, the amount of license revenue recognized in any period may differ significantly from our expectations.

Our products are used across different end markets, and a downturn in any of these end markets could cause a meaningful reduction in demand for our products.

Our products are used across different end markets, and demand for our products is difficult to predict and may vary within or among our Industrial and Automotive, Communications and Computing, and Mobile and Consumer end markets. Our target markets may not grow or develop as we currently expect, and demand may increase or change in one or more of our end markets, and changes in demand may reduce our revenue, lower our gross margin and effect our operating results. We have experienced concentrations of revenue at certain customers and within certain end markets, and we regularly compete for design opportunities at these customers and within these markets. Any deterioration in these end markets, reductions in the magnitude of revenue streams, our inability to meet design and pricing requirements, or volatility in demand for our products could lead to a reduction in our revenue and adversely affect our operating results. Our success in our end markets depends on many factors, including the strength or financial performance of the companies in our end markets, our ability to timely meet rapidly changing product

requirements, market needs, and our ability to maintain design wins across different markets and customers to dampen the effects of market volatility. Our inability to accomplish any of the foregoing, or to offset the volatility of the end markets through diversification into other markets, could materially and adversely affect our business, financial condition, and results of operations.

Our margins are dependent on our achieving continued yield improvement.

We rely on obtaining yield improvements and corresponding cost reductions in the manufacture of existing products and on introducing new products that incorporate advanced features and other price/performance factors that enable us to increase revenues while maintaining acceptable margins. To the extent such cost reductions and new product introductions do not occur in a timely manner, or that our products do not achieve market acceptance or market acceptance at acceptable pricing, our forecasts of future revenue, financial condition, and operating results could be materially adversely affected.

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Shortages in, or increased costs of, wafers and materials could adversely impact our gross margins and lead to reduced revenues.

Worldwide manufacturing capacity for silicon wafers is relatively inelastic. If the demand for silicon wafers or assembly material exceeds market supply, our supply of silicon wafers or assembly material could quickly become limited or prohibitively expensive. We typically have short-term wafer supply agreements that do not ensure long-term supply or allocation commitments. A shortage in manufacturing capacity could hinder our ability to meet product demand and therefore reduce our revenue. In addition, silicon wafers constitute a material portion of our product cost. If we are unable to purchase wafers at favorable prices, our financial condition and results of operations will be adversely affected.

The nature of our business and length of our sales cycle makes our revenue, gross margin and net income subject to fluctuation and difficult to accurately predict.

A number of factors, including how products are manufactured to support end markets, yield, wafer pricing, cost of packaging raw materials, product mix, market acceptance of our new products, competitive pricing dynamics, product quality, geographic and/or end market mix, and pricing strategies, can cause our revenue, gross margins and net income to fluctuate significantly either positively or negatively from period to period.

We have limited visibility into the demand for our products, particularly new products, because demand for our products depends upon our products being designed into our end customers' products and those products achieving market acceptance. During our sales cycle, our customers typically test and evaluate our products prior to deciding to include our products into the design of their own products, and then require additional time to begin volume production of their products. This lengthy sales cycle may cause us to incur significant expenses, experience significant production delays and to incur additional inventory costs before we receive a customer order that may be delayed or never get placed. A key strategic customer may demand certain design or production resources to meet their requirements or work on a specific solution, which could cause delays in our normal development schedule and result in significant investment of our resources or missed opportunities with other potential customers. We may incur these expenses without generating revenue from our products to offset the expenses.

While our sales cycles are typically long, our average product life cycles tend to be short as a result of the rapidly changing technology environment in which we operate. Our inventory levels may be higher than historical norms, from time to time, due to inventory build decisions aimed at meeting expected demand from a single large customer, reducing direct material cost or enabling responsiveness to expected demand. In the event the expected demand does not materialize, or if our short sales cycle does not generate sufficient revenue, we may be subject to incremental excess and obsolescence costs.

These factors make it difficult for us to accurately forecast future sales and project quarterly revenues. The difficulty in forecasting future sales weakens our ability to project our inventory requirements, which could result, and in the past has resulted, in inventory write-downs or failure to meet customer product demands in a timely manner. While we may give guidance, the difficulty in forecasting revenues as well as the relative customer and product mix of those revenues limits our ability to provide accurate forward-looking revenue and gross margin guidance.

We may experience a disruption of our business activities due to changes in our executive leadership team and the resulting management transitions.

We have recently experienced significant changes to our executive leadership team. In August 2018, the Company's Board of Directors announced the appointment of Jim Anderson as the Company's President and Chief Executive Officer, whose employment commenced September 4, 2018. From September 2018 to January 2019, the Company

also announced new appointments to executive leadership roles in finance, research and development, marketing, sales and operations. This executive leadership transition may result in loss of personnel with deep institutional knowledge and has the potential to disrupt our operations and relationships with employees, customers and suppliers. We must successfully integrate our new management team members within our organization in order to achieve our operating objectives, and these management transitions may temporarily affect our financial performance and results of operations as our new executive leadership team becomes familiar with our business. In addition, our competitors may seek to use this transition and the related potential disruptions to gain a competitive advantage over us. Our future operating results depend substantially upon the continued service of our key personnel and in significant part upon our ability to attract and retain qualified management personnel. If we are unable to mitigate these or other similar risks, our business activity could be disrupted, and our financial condition and results of operations could be materially adversely affected.

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Acquisitions, divestitures, strategic investments and strategic partnerships could disrupt our business and adversely affect our financial condition and operating results.

We may pursue growth opportunities by acquiring complementary businesses, solutions or technologies through strategic transactions, investments or partnerships. The identification of suitable acquisition, strategic investment or strategic partnership candidates can be costly and time consuming and can distract our management team from our current operations. If such strategic transactions require us to seek additional debt or equity financing, we may not be able to obtain such financing on terms favorable to us or at all, and such transaction may adversely affect our liquidity and capital structure. We may also choose to divest certain non-core assets, which divestitures could lead to charges against earnings and may expose us to additional liabilities and risks. Any strategic transaction might not strengthen our competitive position, may increase some of our risks, and may be viewed negatively by our customers, partners or investors. Even if we successfully complete a strategic transaction, we may not be able to effectively integrate the acquired business, technology, systems, control environment, solutions, personnel or operations into our business or global tax structure. We may experience unexpected changes in how we are required to account for strategic transactions pursuant to U.S. GAAP and may not achieve the anticipated benefits of any strategic transaction. We may incur unexpected costs, claims or liabilities that we incur during the strategic transaction or that we assume from the acquired company, or we may discover adverse conditions post acquisition for which we have limited or no recourse.

We regularly test for goodwill and other impairments as required under U.S. GAAP, and we may incur future impairments.

We are required under U.S. GAAP to test goodwill for possible impairment on an annual basis and to test goodwill and long-lived assets, including amortizable intangible assets, for impairment at any other time that circumstances arise indicating the carrying value may not be recoverable. For purposes of testing goodwill for impairment, the Company currently operates as one reporting unit: the core Lattice ("Core") business, which includes intellectual property and semiconductor devices. Impairment charges related to amortizable intangible assets from the Silicon Image acquisition totaled approximately $12.5 million, $32.4 million, and $7.9 million in fiscal years 2018, 2017, and 2016, respectively. There is no assurance that future impairment tests will indicate that goodwill or amortizable intangible assets will be deemed recoverable. As we continue to review our business operations and test for impairment or in connection with possible sales of assets, we may have impairment charges in the future, which may be material.

We depend on independent contractors to provide key functions in our product development and operations, and any disruption of their services, or an increased in cost of these services, could negatively impact our financial condition and results of operations.

We depend on subcontractors to provide cost effective and efficient services in our product development and supply chain functions, including test and assembly services, software and hardware development, support of intellectual property cores, inventory management, order fulfillment and direct sales logistics.

Our operations and operating results may be adversely affected if we experience problems with our subcontractors that impact the delivery of product to our customers. These problems may include: delays in software or hardware development timelines, prolonged inability to obtain wafers or packaging materials with competitive performance and cost attributes; inability to achieve adequate yields or timely delivery; inability to meet customer timelines or demands, disruption or defects in assembly, test, or shipping services; or delays in stabilizing manufacturing processes or ramping up volume for new products. If our third-party supply chain providers were to reduce or discontinue services for us or their operations are disrupted as a result of a fire, earthquake, act of terrorism, political unrest, governmental uncertainty, war, disease, or other natural disaster or catastrophic event, weak economic conditions, or any other reason, our financial condition and results of operations could be adversely affected.

Litigation and unfavorable results of legal proceedings could adversely affect our financial condition and operating results.

From time to time we are subject to various legal proceedings and claims that arise out of the ordinary conduct of our business. Certain claims may not yet be resolved, including but not limited to any that are discussed under Item 3. Legal Proceedings and "Note 19 - Contingencies" contained in the Notes to Consolidated Financial Statements, and additional claims may arise in the future. Results of legal proceedings cannot be predicted with certainty. Regardless of merit or outcome, claims or litigation may be both time-consuming and disruptive to our operations and cause significant expense and diversion of management attention and we may enter into material settlements to avoid these risks. Should we fail to prevail in certain matters or enter into a material settlement, we may be faced with significant monetary damages or injunctive relief against us that could materially and adversely affect our financial condition and operating results and certain portions of our business.

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Changes to financial accounting standards may affect our results of operations and could cause us to change our business practices.

We prepare our consolidated financial statements to conform to generally accepted accounting principles in the United States, or U.S. GAAP. These accounting principles are subject to interpretation by the American Institute of Certified Public Accountants, the SEC and various bodies formed to interpret and create accounting rules and regulations. Changes in these rules, such as the adoption of ASC 606 - Revenue from Contracts with Customers in fiscal 2018 or ASC 842 - Leases in fiscal 2019, or in the guidance relating to interpretation and adoption of the rules could have a significant effect on our financial results and could affect portions of our business differently.

Accounting requirements related to sales through our distribution channel could result in our reporting revenue in excess of demand.

New revenue standards require recognition of revenue based on estimates and may require us to book revenue from distributors that is in excess of actual end customer demand. Since we have limited ability to forecast inventory levels of our end customers, we depend on the timeliness and accuracy of resale reports from our distributors. Late or inaccurate resale reports could mask significant build-up of inventories in our distribution channel, have a detrimental effect on our ability to properly recognize revenue, and impact our ability to forecast future sales. An inventory build-up in our distribution channel could result in a slowdown in orders, requests for returns from customers, or requests to move out planned shipments. If our distributors do not ultimately sell the inventory and our estimates change, we could be required to materially correct our recognized revenue in a future period, depending on actual results. Any failure to manage these challenges could disrupt or reduce sales of our products and unfavorably impact our financial results.

Our participation in the HDMI standard is evolving. We no longer act as agent for the HDMI standard and accordingly, our share of adopter fees for the HDMI standard is declining and may further decline.

We acted as agent of the HDMI consortium until December 31, 2016 and were responsible for promoting and administering the specification. We received all of the adopter fees paid by adopters of the HDMI specification in connection with our role as agent. In September 2016, the Founders of the HDMI consortium, of which we are a member, amended the Founders Agreement resulting in changes to our role as agent for the HDMI consortium and to the model for sharing adopter fee revenues. Under the terms of the agreement, our role as the agent was terminated effective January 1, 2017 and a new independent entity was appointed to act as the new HDMI licensing agent with responsibility for licensing and the distribution of royalties among Founders. As a result of the amended model for sharing adopter fee revenue, we will be entitled to a reduced share of adopter fees paid by parties adopting the HDMI standard.

We share HDMI royalties with the other HDMI Founders based on an allocation formula, which is reviewed every three years. Our portion of the royalty allocation has declined for the last several years. In 2015, we received between 24% and 25% of the royalty allocation, while for 2016 and 2017, we received 20% of the royalty allocation. The royalty allocation for 2018 and future years is not yet known but may decline. If the royalty allocation continues to decline, our financial performance could be adversely affected. In addition, delays in the signing of new royalty sharing agreements impacted our timing of revenue recognition and ability to recognize revenue related to the royalties in fiscal 2017. With our adoption of ASU 2014-09, Revenue from Contracts with Customers (Topic 606), we will recognize revenue related to royalties based on estimates of the amounts we will be entitled to receive, and these estimates could differ materiality from actual royalty sharing amounts.

Changes in effective tax rates, tax laws and our global organizational structure and operations could expose us to unanticipated tax consequences.

We are subject to taxation in the United States, Singapore, and other countries. We have a global tax structure that aligns our corporate structure with our global business operations, and we currently operate legal entities in multiple countries. In some countries, we maintain multiple entities for tax or other purposes. We may choose to consolidate or integrate certain of these entities, and these integration activities, changes in tax laws, rates, regulations, future jurisdictional profitability of the Company, and related regulatory interpretations in the countries in which we operate may impact the taxes we pay or tax provision we record, which could adversely affect our results of operations. In addition, future effective tax rates could be affected by changes in the composition of earnings in countries with differing tax rates, changes in the valuation of deferred tax assets and liabilities.

We make no assurance as to what taxes we pay or the ability to estimate our future effective tax rate because of, among other things, uncertainty regarding the tax policies of the jurisdictions where we operate. In particular, we anticipate that the Tax Cuts and Jobs Act, enacted December 22, 2017, will impact us. While we are able to quantify or estimate the effects of some of the provisions now in the act, we do not know of all of the rules the Internal Revenue Service ("IRS") will enact to fully implement the tax law changes, or the IRS' interpretations of the changes. We also continue to analyze and understand the changes and the impacts on us, including the indirect impacts that result from how our industry or we might modify behaviors in a response to the new tax law structure. We also provide no assurance that estimates we provide to quantify the effect of the changes may be accurate.

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We may be subject to warranty claims and other costs related to our products.

In general, we warrant our products for varying lengths of time against non-conformance to our specifications and certain other defects. Because our products, including hardware, software, and intellectual property cores, are highly complex and increasingly incorporate advanced technology, our quality assurance programs may not detect all defects, whether manufacturing defects in individual products or systematic defects that could affect numerous shipments. Inability to detect a defect could result in a diversion of our engineering resources from product development efforts, increased engineering expenses to remediate the defect, and increased costs due to customer accommodation or inventory impairment charges. On occasion, we have also repaired or replaced certain components, made software fixes, or refunded the purchase price or license fee paid by our customers due to product or software defects. Our insurance may be unavailable or inadequate to protect against these issues. If there are significant product defects, the costs to remediate such defects, net of reimbursed amounts from our vendors, if any, or to resolve warranty claims may adversely affect our financial condition and results of operations and may harm our reputation.

If we are unable to adequately protect our new and existing intellectual property rights, our financial results and our ability to compete effectively may suffer.

Our success depends in part on our proprietary technology and we rely upon patent, copyright, trade secret, mask work, and trademark laws to protect our intellectual property. We intend to continue to protect our proprietary technology, however, we may be unsuccessful in asserting our intellectual property rights or such rights may be invalidated, violated, circumvented, or challenged. From time to time, third parties, including our competitors, have asserted against us patent, copyright, and other intellectual property rights to technologies that are important to us. Third parties may attempt to misappropriate our intellectual property through electronic or other means or assert infringement claims against us in the future. Such assertions by third parties may result in costly litigation, indemnity claims, or other legal actions, and we may not prevail in such matters or be able to license any valid and infringed patents from third parties on commercially reasonable terms. This could result in the loss of our ability to import and sell our products or require us to pay costly royalties to third parties in connection with sales of our products. Any infringement claim, indemnification claim, or impairment or loss of use of our intellectual property could materially adversely affect our financial condition and results of operations.

Weakness in our internal control over financial reporting could adversely affect our business and financial results.

In our Annual Report on Form 10-K for the year ended December 30, 2017, we disclosed a material weakness in our internal control over financial reporting related to our risk assessment involving significant unusual transactions. Our management team has developed remediation steps to address such material weakness. Although this material weakness was eliminated by our remediation steps, we may identify a material weakness in our internal control over financial reporting in the future. Any failure to maintain an effective system of internal controls over financial reporting could limit our ability to report our financial results accurately and timely, which could adversely affect our business, financial results and stock price.

A material change in the agreements governing encryption keys we use could place additional restrictions on us, or our distributors or contract manufacturers, which could restrict product shipment or significantly increase the cost to track products throughout the distribution chain.

Certain components in our products contain encryption keys used in connection with High Definition Content Protection ("HDCP"). The regulation and distribution of these encryption keys are controlled through license agreements with Digital Content Protection ("DCP"), a wholly owned subsidiary of Intel Corporation. These license agreements have been modified by DCP from time to time, and such changes could impact us, our distributors, and our customers. An important element of HDMI is the ability to implement link protection for high definition ("HD"),

and more recently, 4K UltraHD, content. We implement various aspects of the HDCP link protection within certain parts we sell. We also, for the benefit of our customers, include the necessary HDCP encryption keys in parts we ship to customers. These encryption keys are provided to us from DCP. We have a specific process for tracking and handling these encryption keys. If DCP changes any of the tracking or handling requirements associated with HDCP encryption keys, we may be required to change our manufacturing and distribution processes, which could adversely affect our manufacturing and distribution costs associated with these products. If we cannot satisfy new requirements for the handling and tracking of encryption keys, we may have to cease shipping or manufacturing certain products.

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We may have failed to adequately insure against certain risks, and, as a result, our financial condition and results may be adversely affected.

We carry insurance customary for companies in our industry, including, but not limited to, liability, property, and casualty; workers' compensation; and business interruption insurance. We also insure our employees for basic medical expenses. In addition, we have insurance contracts that provide director and officer liability coverage for our directors and officers. Other than the specific areas mentioned above, we are self-insured with respect to most other risks and exposures, and the insurance we carry in many cases is subject to a significant policy deductible or other limitation before coverage applies. Based on management's assessment and judgment, we have determined that it is more cost effective to self-insure against certain risks than to incur the insurance premium costs. The risks and exposures for which we self-insure include, but are not limited to, certain natural disasters, certain product defects, certain matters for which we indemnify third parties, political risk, certain theft, patent infringement, and employment practice matters. Should there be a catastrophic loss due to an uninsured event (such as an earthquake) or a loss due to adverse occurrences in any area in which we are self-insured, our financial condition or operating results could be adversely affected.

We compete with others to attract and retain key personnel, and any loss of, or inability to attract, such personnel could adversely affect our ability to compete effectively.

We depend on the efforts and abilities of certain key members of management and other technical personnel. Our future success depends, in part, upon our ability to retain such personnel and attract and retain other highly qualified personnel, particularly product engineers who can respond to market demands and required product innovation. Competition for such personnel is intense and we may not be successful in hiring or retaining new or existing qualified personnel. Additionally, from time to time we have effected restructurings which have eliminated a number of positions. Even if such personnel are not directly affected by the restructuring effort, such terminations can have a negative impact on morale and our ability to attract and hire new qualified personnel in the future. If we lose existing qualified personnel or are unable to hire new qualified personnel, as needed, we could have difficulty competing in our highly-competitive and innovative environment.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

In the first quarter of 2019, we relocated our corporate headquarters from Portland, Oregon to our facility in Hillsboro, Oregon. We lease a 47,800 square foot of space in Hillsboro, Oregon as our corporate headquarters and a research and development facility through November 2022. During 2018, our corporate headquarters and executive office were located in a 23,680 square foot of space leased in Portland, Oregon through March 2025. We plan to fully vacate the space in Portland, Oregon in early 2019 and intend to sublease the vacated space. In San Jose, California, we have 98,874 square feet under lease through September 2016, of which we use 49,579 square feet as a research and development facility, while we vacated 49,295 square feet during the fourth quarter of 2018 and intend to sublease the vacated space.

In Muntinlupa City, Philippines, we lease a total of 48,565 square feet through May 2025 and 1,938 square feet through June 2025 for research and development and operations facilities. In this location, we also leased another 2,856 square feet through April 2018 as storage space that has been consolidated into other facilities.

In Shanghai, China, we lease 68,027 square feet through May 2021 for research and development operations. We also owned an 18,869 square foot research and development facility in Shanghai, China, which we sold in August 2017.

We also lease office facilities in multiple other metropolitan locations for our domestic and international sales staff. We believe that our existing facilities are suitable and adequate for our current and foreseeable future needs.

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Item 3. Legal Proceedings

On or about December 19, 2018, Steven A.W. De Jaray, Perienne De Jaray and Darrell R. Oswald (collectively, the "Plaintiffs") commenced an action against the Company and several unnamed defendants in the Multnomah County Circuit Court of the State of Oregon, in connection with the sale of certain products by the Company to defendants in or around 2008. Plaintiffs allege that the Company violated the Lanham Act, engaged in negligence and fraud by failing to disclose to purchaser the export-controlled status of the subject parts. Plaintiffs seek damages of $138 million, treble damages, and other remedies. In January 2019, the Company removed the action to the United States District Court for the District of Oregon. At this stage of the proceedings, the Company does not have an estimate of the likelihood or the amount of any potential exposure to the Company; however, the Company believes that these claims are without merit and intends to vigorously defend the action. See "Litigation and unfavorable results of legal proceedings could adversely affect our financial condition and operating results" in "Risk Factors" in Item 1A of Part I of this Annual Report on Form 10-K.

From time to time, we are exposed to certain asserted and unasserted potential claims. Periodically, we review the status of each significant matter and assess its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and a range of possible losses can be estimated, we then accrue a liability for the estimated loss. Legal proceedings are subject to uncertainties, and the outcomes are difficult to predict. Because of such uncertainties, accruals are based only on the best information available at the time. As additional information becomes available, we reassess the potential liability related to pending claims and litigation and may revise estimates.

Item 4. Mine Safety Disclosures

Not applicable.

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PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters, and Issuer Purchases of Equity Securities

Market Information

Our common stock is traded on the NASDAQ Global Select Market under the symbol "LSCC".

Holders

As of February 21, 2019, we had approximately 227 stockholders of record.

Dividends

The payment of dividends on our common stock is within the discretion of our Board of Directors. We intend to retain earnings to finance our business. We have never paid cash dividends.

Recent Sales of Unregistered Securities

None.

Issuer Purchases of Equity Securities

None.

Comparison of Total Cumulative Stockholder Return

The following graph shows the five-year comparison of cumulative stockholder return on our common stock, the Standard and Poor's (“S&P”) 500 Index and the Philadelphia Semiconductor Index (“PHLX”) from December 2013 through December 2018. Cumulative stockholder return assumes $100 invested at the beginning of the period in our common stock, the S&P and PHLX. Historical stock price performance is not necessarily indicative of future stock price performance.

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Lattice Cumulative Stockholder Return

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Item 6. Selected Financial Data

	Year Ended (1)				
STATEMENT OF OPERATIONS: (In thousands, except per share data)	December 29, 2018	December 30, 2017	December 31, 2016	January 2, 2016 (3)	January 3, 2015 (2)
Revenue:					
Product	$380,468	$356,502	$390,704	$369,200	$366,127
Licensing and services	18,331	29,459	36,350	36,766	—
Total Revenue	398,799	385,961	427,054	405,966	366,127
Costs and expenses:					
Cost of product revenue	179,101	164,657	179,983	184,914	159,940
Cost of licensing and services revenue	259	4,725	637	1,143	—
Research and development	82,449	103,357	117,518	136,868	88,079
Selling, general, and administrative	91,054	90,718	98,602	97,349	73,527
Amortization of acquired intangible assets	17,690	31,340	33,575	29,580	2,948
Restructuring charges	17,349	7,196	9,267	19,239	17
Acquisition related charges	1,531	3,781	6,305	22,450	—
	12,486	32,431	7,866	21,655	—

Impairment of goodwill and acquired intangible assets					
Gain on sale of building	—	(4,624)	—	—	—
Total costs and expenses	401,919	433,581	453,753	513,198	324,511
(Loss) income from operations	(3,120)	(47,620)	(26,699)	(107,232)	41,616
Interest expense	(20,600)	(18,807)	(20,327)	(18,389)	(172)
Other (expense) income, net	(249)	(3,286)	2,844	(1,072)	1,497
(Loss) income before income taxes	(23,969)	(69,713)	(44,182)	(126,693)	42,941
Income tax expense (benefit)	2,353	849	9,917	32,540	(5,639)
Net (loss) income	$(26,322)	$(70,562)	$(54,099)	$(159,233)	$48,580
Net (loss) income per share:					
Basic	$(0.21)	$(0.58)	$(0.45)	$(1.36)	$0.41
Diluted	$(0.21)	$(0.58)	$(0.45)	$(1.36)	$0.40
Shares used in per					

share calculations:					
Basic	126,564	122,677	119,994	117,387	117,708
Diluted	126,564	122,677	119,994	117,387	120,245

BALANCE SHEET: (In thousands)	December 29, 2018	December 30, 2017	December 31, 2016	January 2, 2016	January 3, 2015
Cash, cash equivalents, and short-term marketable securities	$128,675	$111,797	$116,860	$102,574	$254,844
Total assets	$623,687	$635,961	$766,883	$785,920	$510,530
Long term liabilities	$295,812	$334,621	$338,903	$369,223	$8,809
Total liabilities	$365,230	$418,268	$496,453	$480,400	$69,555
Total stockholders' equity	$258,457	$217,693	$270,430	$305,520	$440,975

(1) Results for periods prior to 2018 are presented in accordance with ASC 605, which was in effect during those fiscal years.

(2) The year ended January 3, 2015 was a 53-week year as compared to the other years presented, which were based on our standard 52-week year.

(3) Our results for the year ended January 2, 2016 include the results associated with the acquisition of Silicon Image for the approximately 10-month period from March 11, 2015 through January 2, 2016. Results presented for the period prior to fiscal 2015 are those historically reported for Lattice only.

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

Overview

Lattice Semiconductor and its subsidiaries (“Lattice,” the “Company,” “we,” “us,” or “our”) is a Delaware corporation that develops semiconductor technologies that we monetize through products, solutions, design services, and licenses. We engage in smart connectivity, control, and compute solutions, providing intellectual property ("IP") and low-power, small form-factor programmable logic devices that enable global customers to quickly and easily develop innovative, smart, and connected products. We help their products become more aware, interact more intelligently, and make better and faster connections. In an increasingly intense global technology market, we help our customers get their products to market faster than their competitors. Our broad end-market exposure extends from mobile devices and consumer electronics to industrial and automotive equipment, communications and computing infrastructure, and licensing and services. Lattice was founded in 1983 and is headquartered in Hillsboro, Oregon.

Discontinuation of millimeter wave business

In the second quarter of 2018, we made the strategic decision to discontinue our millimeter wave business, which included certain assets related to our Wireless products, and our Board of Directors approved a related internal restructuring plan. This action was designed to improve profitability, reduce our infrastructure costs, and re-focus on our core business activities. Approximately $24.1 million of total expense was recorded in our Consolidated Statements of Operations in fiscal 2018, including $11.9 million charged to Impairment of acquired intangible assets, $8.0 million charged to Cost of product revenue for inventory reserves, and $4.2 million charged to Restructuring charges for severance and other personnel costs, and for other asset restructuring. See Notes 6, 8, 10, and 15 to our consolidated financial statements presented in Part 2, Item 8 of this Report for additional details on the charges and costs related to the discontinuation of our millimeter wave business.

Critical Accounting Policies and Use of Estimates

Critical accounting policies are those that are both most important to the portrayal of a company's financial condition and results, and that require management's most difficult, subjective, and complex judgments, often as a result of the need to make estimates about the effect of matters that are inherently uncertain.

The preparation of financial statements in conformity with U.S. generally accepted accounting principles ("U.S. GAAP") requires management to make estimates and assumptions that affect the reported amounts and classification of assets, such as marketable securities, accounts receivable, contract assets included in prepaid expenses and other current assets, inventory, goodwill (including the assessment of reporting unit), intangible assets, current and deferred income taxes, accrued liabilities (including restructuring charges and bonus arrangements), disclosure of contingent assets and liabilities at the date of the financial statements, amounts used in acquisition valuations and purchase accounting, impairment assessments, the fair value of equity awards, and the reported amounts of product revenue, licensing and services revenue, and expenses during the fiscal periods presented.

We base our estimates and judgments on historical experience, knowledge of current conditions, and our beliefs of what could occur in the future considering available information. While we believe that our estimates, assumptions, and judgments are reasonable, they are based on information available when made, and because of the uncertainty inherent in these matters, actual results may differ from these estimates under different assumptions or conditions. We evaluate our estimates and judgments on an ongoing basis. We believe the following accounting policies and the related estimates are critical in the portrayal of our financial condition and results of operations, and require management's most difficult, subjective, or complex judgments. See "Note 1 - Nature of Operations and Significant

Accounting Policies" under Part II, Item 8 of this report for further information on the significant accounting policies and methods used in the preparation of the consolidated financial statements.

Revenue from Contracts with Customers

We adopted ASC 606, Revenue from Contracts with Customers, effective on December 31, 2017, the first day of our 2018 fiscal year, using the modified retrospective method. Under this standard, we recognize revenue under the core principle of depicting the transfer of control to our customers. We measure revenue based on the amount of consideration we expect to be entitled to in exchange for products or services. For revenue recognized on both sales to distributors and related to HDMI royalties, the amount of consideration we expect to be entitled to receive is based on estimates that require assumptions and judgments relating to trends in recent and historical activity. See "Note 2 - Revenue from Contracts with Customers" under Part II, Item 8 of this report for further information on our recognition of revenue.

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Sales to most distributors are made under terms allowing certain price adjustments and limited rights of return of our products held in their inventory or upon sale to their end customers. Such price adjustments are estimated using the expected value method based on an analysis of historical price adjustments, at the distributor and product level, over a period of time considered adequate to account for current pricing and business trends, typically 6 months. Any differences between the estimated consideration and the actual amount received from the customer is recorded in the period that the actual consideration becomes known. To date, these differences have not been material. Most of our distributors are entitled to limited rights of return, referred to as stock rotation, not to exceed 5% of billings, net of returns and price adjustments. Stock rotation reserves are based on historical return rates and recorded as a reduction to revenue with a corresponding reduction to cost of goods sold for the estimated cost of inventory that we expect to be returned. The revenue recognized based on estimated price adjustments and stock rotation reserves may be materially different from the actual consideration received if the actual distributor price adjustments and stock rotation returns differ significantly from historical trends.

HDMI royalty revenue is determined by a contractual allocation formula agreed to by the founders of the HDMI consortium ("Founders"). The contractual allocation formula is subject to periodic adjustment, generally every three years. An agreement covering the period beginning January 1, 2018 is yet to be signed. While a new royalty sharing agreement is being negotiated with the other Founders of the HDMI consortium, the HDMI agent is unable to distribute the majority of the royalties collected to the Founders. We are recording revenue based on our estimated share of the royalties, which we determine using an analytical model that combines historical and forecasted collection trends with our expected share of those collections. This estimate will be adjusted once the Founders finalize the agreement for the period beginning January 1, 2018. Under a new agreement, our share of HDMI collections may change significantly from our current assumptions, and our estimated revenue could differ martially from actual royalty sharing amounts received.

Inventories and Cost of Product Revenue

Inventories are recorded at the lower of average cost determined on a first-in-first-out basis or market. We establish provisions for inventory if it is obsolete or we hold quantities which are in excess of projected customer demand. The creation of such provisions results in a write-down of inventory to net realizable value and a charge to Cost of product revenue.

Restructuring Charges

Expenses associated with exit or disposal activities are recognized when incurred under ASC 420, “Exit or Disposal Cost Obligations,” for everything but severance expenses, which are recognized under ASC 712, “Compensation - Nonretirement Postemployment Benefits.” When leased facilities are vacated, an amount equal to the total future lease obligations from the date of vacating the premises through the expiration of the lease, net of any future sublease income, is recorded as a part of restructuring charges. Expenses from other exit or disposal activities, including the cancellation of software contracts and engineering tools or the abandonment of long lived assets, is recorded as a part of restructuring charges. Because we have a history of paying severance benefits, the cost of severance benefits associated with a restructuring plan is recorded when such costs are probable and the amount can be reasonably estimated in accordance with ASC 712.

Impairment of Long-Lived Assets

Long-lived assets, including amortizable intangible assets, are carried on our financial statements based on their cost less accumulated depreciation or amortization. We monitor the carrying value of our long-lived assets for potential impairment and test the recoverability of such assets annually during the fourth quarter and whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. These events or changes in

circumstances, including management decisions pertaining to such assets, are referred to as impairment indicators. If an impairment indicator occurs, we perform a test of recoverability by comparing the carrying value of the asset group to its undiscounted expected future cash flows. If the carrying values are in excess of undiscounted expected future cash flows, we measure any impairment by comparing the fair value of the asset group to its carrying value. Fair value is generally determined by considering (i) internally developed discounted projected cash flow analysis of the asset group; (ii) actual third-party valuations; and/or (iii) information available regarding the current market for similar asset groups. If the fair value of the asset group is determined to be less than the carrying amount of the asset group, an impairment in the amount of the difference is recorded in the period that the impairment indicator occurs and is included in our Consolidated Statements of Operations. Estimating future cash flows requires significant judgment and projections may vary from the cash flows eventually realized, which could impact our ability to accurately assess whether an asset has been impaired.

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Accounting for Income Taxes

Our provision for income tax is comprised of our current tax liability and changes in deferred tax assets and liabilities. Deferred tax assets and liabilities are recognized for the expected tax consequences of temporary differences between the tax bases of assets and liabilities and their reported amounts in the financial statements using enacted tax rates and laws that will be in effect when the difference is expected to reverse. Valuation allowances are provided to reduce deferred tax assets to an amount that in management's judgment is more-likely-than-not to be recoverable against future taxable income. The determination of a valuation allowance and when it should be released requires complex judgment. In assessing the ability to realize deferred tax assets, we evaluate both positive and negative evidence that may exist and consider whether it is more-likely-than-not that some portion or all of the deferred tax assets will be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible.

As part of our financial review process, we also assess the likelihood that our tax reporting positions will ultimately be sustained. To the extent it is determined it is more likely than not (a likelihood of more than 50 percent) that some portion or all of a tax reporting position will ultimately not be recognized and sustained, a provision for unrecognized tax benefit is provided by either reducing the applicable deferred tax asset or accruing an income tax liability. Our judgment regarding the sustainability of our tax reporting positions may change in the future due to changes in U.S. or international tax laws and other factors. These changes, if any, may require material adjustments to the related deferred tax assets or accrued income tax liabilities and an accompanying reduction or increase in income tax expense which may result in a corresponding increase or decrease in net income in the period when such determinations are made.

Results of Operations

Key elements of our Consolidated Statements of Operations are presented in the following table:

	Year Ended *					
(In thousands)	December 29, 2018		December 30, 2017		December 31, 2016	
Revenue	$398,799	100.0 %	$385,961	100.0 %	$427,054	100.0 %
Gross margin	219,439	55.0	216,579	56.1	246,434	57.7
Research and development	82,449	20.7	103,357	26.8	117,518	27.5
Selling, general, and administrative	91,054	22.8	90,718	23.5	98,602	23.1
Amortization of acquired intangible assets	17,690	4.4	31,340	8.1	33,575	7.9
Restructuring charges	17,349	4.4	7,196	1.9	9,267	2.2
Acquisition related charges	1,531	0.4	3,781	1.0	6,305	1.5
Impairment of acquired intangible assets	12,486	3.1	32,431	8.4	7,866	1.8
Gain on sale of building	—	—	(4,624)	(1.2)	—	—
Loss from operations	$(3,120)	(0.8)%	$(47,620)	(12.3)%	$(26,699)	(6.3)%

* Results for 2017 and 2016 are presented in accordance with ASC 605, which was in effect during those fiscal years.

We adopted ASC 606, Revenue from Contracts with Customers, on December 31, 2017 using the modified retrospective method. We have not restated any prior financial statements presented. See "Note 2 - Revenue from Contracts with Customers" to our consolidated financial statements and the Revenue discussions, below, for the impact of the adoption of ASC 606.

Revenue

	Year Ended *			% Change in	
(In thousands)	December 29, 2018	December 30, 2017	December 31, 2016	2018	2017
Revenue	$398,799	$ 385,961	$ 427,054	3	(10)

* Results for 2017 and 2016 are presented in accordance with ASC 605, which was in effect during those fiscal years.

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Revenue increased $12.8 million, or 3%, in fiscal 2018 compared to fiscal 2017, primarily driven by (1) increased demand for our products that perform control applications in server reference designs, (2) broad market increases from industrial market customers, particularly in growth from the products supporting industrial video applications and factory automation robotics applications, (3) growth in products used by several handset screen replacement customers, (4) increased demand for products used in home automation devices, and (5) increases in royalties that we recognized as revenue in fiscal 2018 under ASC 606. These were partially offset by a decline in demand for products supporting a major handset manufacturer, by the discontinuation of our millimeter wave business, and by a patent sale that was recognized in fiscal 2017 but which did not recur in fiscal 2018.

For fiscal 2018, adoption of ASC 606 increased our revenues by $15.6 million compared to revenue that would have been recognized under previous guidance. Of this amount, $14.1 million was due to the acceleration of revenue recognition on sales to certain distributors, and an additional $1.5 million was due to increases in Licensing and services revenue from the timing of revenue recognition from HDMI royalties and audit settlements.

Revenue decreased $41.1 million, or 10%, in fiscal 2017 compared to fiscal 2016, primarily driven by lower revenue from consumer mobile handsets and reductions from Digital Television ("DTV") and Home Theater related devices. This was coupled with a decline from the line item reduction caused by the obsoleting of tin leaded assembly material in one of the complex programmable logic devices ("CPLD") in the industrial and communications markets, for which shipments predominately occurred in fiscal 2016 but did not recur in fiscal 2017. These decreases were partially offset by a broad market increase in programmable logic device revenue in the Industrial and Automotive end market, and the production ramp of a server reference design being widely adopted in the computing market. Additionally, in fiscal 2017 we saw growth in our XO2/XO3 and EC5 product families, revenue from a patent sale transaction, and modest growth in the 60GHz wireless silicon products.

Revenue by End Market

The end market data below is derived from data provided to us by our distributors and end customers. With a diverse base of customers who may manufacture end products spanning multiple end markets, the assignment of revenue to a specific end market requires the use of estimates and judgment. Therefore, actual results may differ from those reported.

Under ASC 606, we recognize certain revenue for which end customers and end markets are not yet known. We assign this revenue first to a specific end market using historical and anticipated usage of the specific products, if possible, and allocate proportionally to the end markets if we cannot identify a specific end market.

Our Licensing and services end market includes revenue from the licensing of our IP, the collection of certain royalties, patent sales, the revenue related to our participation in consortia and standard-setting activities, and services. While Licensing products are primarily sold into the Mobile and Consumer market, Licensing and services revenue is reported as a separate end market as it has characteristics that differ from other categories, most notably its higher gross margin.

The following are examples of end market applications for the fiscal years presented:

Communications and Computing	Mobile and Consumer	Industrial and Automotive	Licensing and Services
Wireless	Smart-phones	Security and Surveillance	IP Royalties
Wireline	Cameras	Machine Vision	Adopter Fees
Data Backhaul	Displays	Industrial Automation	IP Licenses
Client Computing	Wearables	Human Computer Interaction	Patent Sales
Data Center Computing	Televisions	Automotive	Testing Services
Data Storage	Home Theater	Drones	Design Services

The composition of our revenue by end market is presented in the following table:

(In thousands)	Year Ended * December 29, 2018		December 30, 2017		December 31, 2016		% Change in 2018	2017
Communications and Computing	$123,195	31%	$113,019	29%	$123,021	29%	9	(8)
Mobile and Consumer	99,294	25	108,844	28	127,405	30	(9)	(15)
Industrial and Automotive	157,979	39	134,639	35	140,278	33	17	(4)
Licensing and Services	18,331	5	29,459	8	36,350	8	(38)	(19)
Total revenue	$398,799	100%	$385,961	100%	$427,054	100%	3	(10)

* Results for 2017 and 2016 are presented in accordance with ASC 605, which was in effect during those fiscal years.

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Our revenue in the Communications and Computing end market is largely dependent on a small number of large telecommunications equipment providers. For fiscal 2018, Communications and Computing end market revenue increased 9% primarily due to continued demand increases for server products, partially offset by the discontinuation of our millimeter wave business. For fiscal 2017, Communications and Computing end market revenue declined 8% primarily in the communications market, which saw a significant decrease in revenue from a major telecommunications customer whose business was affected by Commerce department actions, and by conversion of materials from 200mm to 300mm wafers. This was partially offset by growth in the Communications and Computing end market due to the initial production ramp of the server platform reference design being widely adopted in that sector.

Mobile and Consumer end market revenue decreased 9% in fiscal 2018, after decreasing 15% in fiscal 2017. Mobile and Consumer end market revenue decreased in fiscal 2018 primarily due to a decline in demand for products supporting a major handset manufacturer, partially offset by increased demand for home automation and handset screen replacement products. Consumer end market revenue decreased in fiscal 2017 primarily due to a significant decrease in volume for a major mobile handset provider. The production volume for this mobile handset peaked in the fourth quarter of fiscal 2016, and the associated revenue stream has declined in subsequent quarters as the end product completes its lifecycle. These decreases were coupled with declines in revenue from HDMI devices used in DTV and Home Theater related products and from MHL devices used in mobile handsets.

For fiscal 2018, Industrial and Automotive end market revenue increased 17% when compared to fiscal 2017. This is primarily due to broad market increases in the Industrial end market as well as growth from the products supporting industrial video applications and factory automation robotics applications. For fiscal 2017, Industrial and Automotive end market revenue decreased 4% when compared to fiscal 2016. This is primarily due to a decline from the line item reduction caused by the obsoleting of tin leaded assembly material in one of the CPLD devices for which shipments predominately occurred in fiscal 2016 but did not recur in fiscal 2017. This decrease was substantially offset by broad market growth in this end market, especially from our XO2/XO3 FPGA product families.

Revenue from the Licensing and Services end market decreased by 38% in fiscal 2018 compared to fiscal 2017 predominantly due to revenue from a patent sale in the first half of fiscal 2017 that did not recur in the current year, and by the absence of revenue from Simplay Labs testing activities after the transfer of certain assets related to that business unit at the end of the third quarter of fiscal 2017. These decreases are partially offset by HDMI royalties that we recognized as revenue in fiscal 2018 under ASC 606 but were not able to recognize in fiscal 2017 under the previous guidance.

Licensing and Services revenue decreased by 19% in fiscal 2017 primarily due to lower revenue from HDMI licensing and adopter fees as a new royalty sharing agreement had not been finalized, and by the termination of our role as agent for the HDMI consortium. As a result of the amended model for sharing revenue and the appointment of a new independent agent for the HDMI consortium, we will be entitled to a reduced share of adopter fees paid by parties adopting the HDMI standard in 2017 and future years. The termination of our role as agent for the HDMI consortium resulted in a decrease of approximately $11 million for fiscal 2017 compared to fiscal 2016. While a new royalty sharing agreement is being negotiated, the HDMI agent is collecting royalties but is unable to distribute a majority of the royalties to the Founders. Given that a new royalty sharing agreement was not fully executed under previous revenue guidance, the fixed and determinable revenue recognition criteria was not met, and we were unable to recognize all of the HDMI royalty revenue in fiscal 2017. Revenue attributable to HDMI royalties is down approximately $9 million for fiscal 2017 compared to fiscal 2016 mainly as a result of the royalty sharing formula not being finalized. The decrease related to HDMI was partially offset by a patent sale transaction of $18 million in fiscal 2017.

We share HDMI royalties with the other HDMI Founders based on an allocation formula, which is reviewed every three years. The most recent royalty sharing formula covered the period from January 1, 2014 through December 31, 2016, and an interim agreement covering the period from January 1, 2017 through December 31, 2017 was signed in the second quarter of fiscal 2018. However, a new agreement covering the period beginning January 1, 2018 is yet to be signed. As a result of the signing of the HDMI Founders royalty sharing agreement for 2017, we received $6.4 million in cash during the second quarter of fiscal 2018 for fiscal 2017 HDMI royalties. Collection of this amount had no impact on our reported revenues and was recorded as a reduction to the contract asset recorded in Prepaid expenses and other current assets in our Consolidated Balance Sheets. This contract asset was recorded in the first quarter of fiscal 2018 with an offset to Accumulated deficit as a cumulative effect adjustment for the adoption of ASC 606.

HDMI royalties are considered variable consideration under the new revenue standard and recognized as royalty revenue as usage occurs. While a new royalty sharing agreement is being negotiated with the other Founders of the HDMI consortium for fiscal 2018, we are estimating our share of royalty revenues under an anticipated new agreement. Before the HDMI royalty sharing agreement is signed, we estimate that we will recognize $1 million to $2 million of additional Licensing and Services revenue every quarter under ASC 606 that we would not have recognized under previous guidance. Once the HDMI royalty sharing agreement is signed, ongoing HDMI royalty revenue recognition under both ASC 606 and previous guidance will be consistent during the term of that sharing agreement.

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For fiscal 2018, adoption of ASC 606 increased our revenues by $15.6 million compared to revenue that would have been recognized under previous guidance. Of this amount, $14.1 million was due to the acceleration of revenue recognition on sales to certain distributors, with $4.7 million attributed to Communications and Computing, $4.6 million attributed to Mobile and Consumer, and $4.8 million attributed to Industrial and Automotive. An additional $1.5 million was due to increases in Licensing and Services revenue comprised of an increase of $7.9 million, mainly in HDMI royalties and audit settlements for fiscal 2018, partially offset by $6.4 million in 2017 HDMI royalties collected that were not recorded as revenue in either fiscal 2018 under ASC 606 or in fiscal 2017 under previous guidance.

Revenue by Geography

We assign revenue to geographies based on ship-to location of the end customer, where available, and based upon the location of the distributor to which the product was shipped otherwise.

The composition of our revenue by geography is presented in the following table:

	Year Ended *						% Change in	
(In thousands)	December 29, 2018		December 30, 2017		December 31, 2016		2018	2017
Asia	$298,119	75 %	$277,638	72 %	$305,093	71 %	7	(9)
Europe	45,546	11	44,547	12	59,835	14	2	(26)
Americas	55,134	14	63,776	16	62,126	15	(14)	3
Total revenue	$398,799	100%	$385,961	100%	$427,054	100%	3	(10)

* Results for 2017 and 2016 are presented in accordance with ASC 605, which was in effect during those fiscal years.

Revenue in Asia increased 7% in fiscal 2018. Asia revenue is heavily affected by revenue from all of the end markets we serve. The increase in fiscal 2018 was predominately due to increasing demand for our products performing control applications in servers, significant growth in the Consumer space from several handset screen replacement customers, increased demand from Industrial broad market customers, and strength at a major telecommunications customer. These increases were partially offset by decline in demand from a major handset manufacturer.

In fiscal 2017, revenue decreased 9% in Asia primarily due to a significant decrease in Communications and Computing end market revenue from a major telecommunications customer whose business was affected by government regulations, and by conversion of materials from 200mm to 300mm wafers. Additionally, the Mobile and Consumer end market saw a significant decrease in volume for a major North American mobile handset provider. The production volume for this mobile handset peaked in the fourth quarter of fiscal 2016, and the associated revenue stream has declined in subsequent quarters as the end product completes its lifecycle. This was coupled with decreased revenue from DTV and Home Theater related devices.

Revenue in Europe increased 2% in fiscal 2018 as the region is showing renewed growth in the broad market, especially in the Industrial end market. Revenue in Europe decreased 26% in fiscal 2017 primarily due to a decline in the line item reduction caused by the obsoleting of tin leaded assembly material in one of the CPLD devices, for which shipments predominately occurred in fiscal 2016 but did not recur in fiscal 2017.

Revenue from the Americas decreased 14% in fiscal 2018 primarily due to a patent sale that was recognized in fiscal 2017 but which did not recur in fiscal 2018. This was partially offset by other royalty revenue and broad market growth in the region. Revenue from the Americas increased 3% in fiscal 2017 primarily due to a patent sale transaction for $18.0 million recognized in fiscal 2017, substantially offset by a decline in the line item reduction and

CPLD conversion program, for which shipments predominately occurred in fiscal 2016 but did not recur in fiscal 2017.

Revenue from foreign sales as a percentage of total revenue was 90%, 87%, and 88% for fiscal 2018, 2017 and 2016, respectively.

For fiscal 2018, adoption of ASC 606 increased our revenues by $15.6 million compared to revenue that would have been recognized under previous guidance. Of this amount, $14.1 million was due to the acceleration of revenue recognition on sales to certain distributors, with $12.3 million of this amount attributed to Asia, and $2.0 million attributed to the Americas, partially offset by a $0.2 million decrease attributed to Europe. An additional $1.5 million was due to increases in Licensing and Services revenue, attributed to the Americas, described above.

Revenue from End Customers

Our top five end customers accounted for approximately 18% of our total revenue in fiscal 2018, compared to approximately 26% and 27% in fiscal years 2017 and 2016, respectively, primarily due to a more diverse customer base in recent years.

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During fiscal years 2018, 2017 and 2016, no end customer accounted for more than 10% of total revenue. Our largest end customer in fiscal 2018 accounted for approximately 6.1% of total revenue. Our largest end customer in fiscal 2017 accounted for approximately 7.3% of total revenue, while our largest end customer in fiscal 2016 accounted for approximately 9.9% of total revenue.

Under ASC 606, we did not have enough information to assign end customers to approximately $14.1 million of revenue recognized in fiscal 2018 on shipments to distributors that have not sold through to end customers.

Revenue from Distributors

Distributors have historically accounted for a significant portion of our total revenue. Revenue attributable to our primary distributors is presented in the following table:

	Year Ended *					
	December 29, 2018		December 30, 2017		December 31, 2016	
Arrow Electronics Inc.	29	%	24	%	24	%
Weikeng Group	25		27		22	
All others	29		26		27	
All distributors **	83	%	77	%	73	%

* Results for 2017 and 2016 are presented in accordance with ASC 605, which was in effect during those fiscal years.

** During the first quarter of 2018, we updated our channel categories to group all forms of distribution into a single channel. Prior periods have been reclassified to match current period presentation.

For both fiscal 2018 compared to fiscal 2017 and for fiscal 2017 compared to fiscal 2016, revenue attributable to revenue streams other than distributors decreased, resulting in increases in distribution revenue as a percentage of total revenue.

The most significant impact of the adoption of ASC 606 was to accelerate the timing of revenue recognition on product shipments to most of our distributors, resulting in an additional $14.1 million of revenue in fiscal 2018. Assuming all other revenue recognition criteria have been met, the new guidance requires us to recognize revenue and costs relating to such sales upon the transfer of control of the products to the distributor, whereby the transaction price recognized as revenue is estimated considering price adjustments and returns, rather than upon the ultimate sale by the distributor to its end customer when the final transaction price is known, as was our practice under previous guidance. The impact of this change will depend primarily on the level of inventory held by distributors at the beginning and end of each period. To the extent these inventory levels fluctuate significantly, revenue under the new standard could be materially different than that under the previous standard.

Gross margin

The composition of our gross margin, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018		December 30, 2017		December 31, 2016	
Gross margin	$219,439		$216,579		$246,434	
Percentage of revenue	55.0	%	56.1	%	57.7	%
Product gross margin %	52.9	%	53.8	%	53.9	%
Licensing and services gross margin %	98.6	%	84.0	%	98.2	%

Gross margin, as a percentage of revenue, decreased 1.1 percentage points from fiscal 2017 to fiscal 2018. The overall gross margin was influenced by the relative mix between product revenue and licensing and services revenue, and this decline resulted primarily from lower licensing and services revenue. Licensing and services accounted for approximately 4.6% of total revenue in fiscal 2018 compared to 7.6% during fiscal 2017. Additionally, with the discontinuation of our millimeter wave business, there were inventory reserves taken on eliminated product lines during 2018 that further decreased gross margin.

The primary driver of the 0.9 percentage point decrease in product gross margin in fiscal 2018 was specific inventory reserves of $8.0 million taken on products that were eliminated with the discontinuation of our millimeter wave business. This was partially offset by decreased volume and costs from the Mobile and Consumer end market.

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The 14.6 percentage point increase in licensing and services gross margin in fiscal 2018, compared to fiscal 2017, was due primarily to the $18.0 million patent sale that was recognized in two installments during the first and second quarters of fiscal 2017. The costs associated with the patent sale of $3.6 million, primarily the net book value of the patents acquired in our acquisition of Silicon Image, were greater than usual for this category and had a substantial impact on licensing and services gross margin.

Gross margin, as a percentage of revenue, decreased 1.6 percentage points from fiscal 2016 to fiscal 2017 primarily due to the decrease in licensing and services gross margin, which decreased 14.2 percentage points from fiscal 2016 to fiscal 2017. This was primarily due to the $18.0 million patent sale in fiscal 2017. The costs associated with the patent sale of $3.6 million, primarily the net book value of the patents acquired in our acquisition of Silicon Image, were greater than usual for this category and had a substantial impact on licensing and services gross margin.

Because of its higher margin, the licensing and services portion of our overall revenue can have a disproportionate impact on gross margin and profitability. For programmable and standard products, we expect that product, end market, and customer mix will subject our gross margin to fluctuation, while we expect downward pressure on average selling price to adversely affect our gross margin in the future. If we are unable to realize additional or sufficient product cost reductions in the future to balance changes in product and customer mix, we may experience degradation in our product gross margin.

Operating Expenses

Research and development expense

The composition of our Research and development expense, including as a percentage of revenue, is presented in the following table:

	Year Ended			% Change in	
(In thousands)	December 29, 2018	December 30, 2017	December 31, 2016	2018	2017
Research and development	$82,449	$ 103,357	$ 117,518	(20.2)%	(12.1)%
Percentage of revenue	20.7 %	26.8 %	27.5 %		
Mask costs included in Research and development	$987	$ 931	$ 3,328	6.0 %	(72.0)%

Research and development expense includes costs for compensation and benefits, stock compensation, development masks, engineering wafers, depreciation, licenses, and outside engineering services. These expenditures are for the design of new products, IP cores, processes, packaging, and software to support new products.

We believe that a continued commitment to research and development is essential to maintaining product leadership and providing innovative new product offerings and, therefore, we expect to continue to make significant future investments in Research and development.

The decrease in Research and development expense for fiscal 2018 compared to fiscal 2017 is due mainly to the cost reductions realized from restructuring actions and from the sale of assets and discontinuation of a business unit. These savings were predominantly from headcount related expenses, including lower stock compensation expense, and from reductions in both time-based licenses and depreciation.

The decrease in Research and development expense for fiscal 2017 compared to fiscal 2016 is due mainly to the cost reductions realized from the restructuring actions and integration of operations undertaken since the acquisition of Silicon Image, including the sales of assets and discontinuation of business units. These savings were predominantly from headcount reductions and site consolidations. Additionally, we saw reduced mask, wafer, and assembly costs,

and depreciation expense, partially offset by higher bonus and IP insourcing expenses.

Selling, general, and administrative expense

The composition of our Selling, general, and administrative expense, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Selling, general, and administrative	$91,054	$ 90,718	$ 98,602	0.4%	(8.0)%
Percentage of revenue	22.8 %	23.5 %	23.1 %		

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Selling, general, and administrative expense includes costs for compensation and benefits related to selling, general, and administrative employees, commissions, depreciation, professional and outside services, trade show, and travel expenses.

The increase in Selling, general, and administrative expense for fiscal 2018 compared to fiscal 2017 is due mainly to the costs associated with our executive transitions, including accelerated stock compensation and severance expense, and search fees. These were partially offset by decreases in legal fees and bonus expense.

The decrease in Selling, general, and administrative expense for fiscal 2017 compared to fiscal 2016 was due mainly to lower bad debt expense in 2017. We also saw lower legal and accounting fees that were partially offset by increased bonus, travel, and depreciation expenses.

Amortization of acquired intangible assets

The composition of our Amortization of acquired intangible assets, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Amortization of acquired intangible assets	$17,690	$ 31,340	$ 33,575	(43.6)%	(6.7)%
Percentage of revenue	4.4 %	8.1 %	7.9 %		

The decrease in Amortization of acquired intangible assets for fiscal 2018 compared to fiscal 2017 is primarily due to the reduction of certain intangibles as a result of patent sales and impairment charges in current and previous periods.

For fiscal 2017 compared to fiscal 2016, Amortization of acquired intangible assets decreased due to the reduction of certain intangibles as a result of impairment charges, patent sales, and sale of the Qterics business unit, partially offset by additional amortization due to the completion of certain in-process research and development projects acquired from Silicon Image.

Restructuring charges

The composition of our Restructuring charges, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Restructuring charges	$17,349	$ 7,196	$ 9,267	100+%	(22.3)%
Percentage of revenue	4.4 %	1.9 %	2.2 %		

Restructuring charges include expenses resulting from reductions in our worldwide workforce, consolidation of our facilities, removal of fixed assets from service, and cancellation of software contracts and engineering tools.

In December 2018, our management approved and executed an internal restructuring plan (the “December 2018 Plan”), which included a global workforce reduction. This plan also included the abandonment of long lived assets related to the restructuring of our agreements with a privately-held investee. Approximately $4.8 million of restructuring expense has been incurred through December 29, 2018 under the December 2018 Plan, and we believe this amount approximates the total costs under the plan.

In June 2018, our Board of Directors approved an internal restructuring plan (the "June 2018 Plan"), which included the discontinuation of our millimeter wave business and the use of certain assets related to our Wireless products, and a workforce reduction. The June 2018 Plan is designed to reduce our infrastructure costs and re-focus on our core business activities. Approximately $4.2 million of restructuring expense has been incurred through December 29, 2018 under the June 2018 Plan, and we believe this amount approximates the total costs under the plan.

In June 2017, our Board of Directors approved an additional internal restructuring plan (the "June 2017 Plan"), which included the sale of 100% of the equity of our Hyderabad, India subsidiary and the transfer of certain assets related to our Simplay Labs testing and certification business, a worldwide workforce reduction, and an initiative to reduce our infrastructure costs, including reconfiguring our use of certain leased properties. Under this initiative approved by the Board in 2017, we vacated approximately 50% or our facility in San Jose, California in the fourth quarter of fiscal 2018 and recorded approximately $6.9 million of Restructuring charges from ceasing use of this space. These actions are part of an overall plan to achieve financial targets and to enhance our financial and competitive position by better aligning our revenue and operating expenses. Approximately $16.4 million of total expense has been incurred through December 29, 2018 under the June 2017 Plan, and we expect the total cost to be approximately $21.5 million to $23.0 million.

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The $10.2 million increase in Restructuring charges in fiscal 2018 compared to fiscal 2017 was driven by significant severance, abandoned lease, and software license restructuring charges in the current year related to the December 2018 Plan, the June 2018 Plan and the June 2017 Plan versus smaller charges in the previous year under the June 2017 Plan.

The $2.1 million decrease in Restructuring charges from fiscal 2016 to fiscal 2017 is primarily the result of significant lease restructuring charges in the prior year related to the March 2015 Plan versus a significantly smaller charge in the current year under the June 2017 Plan. Increased restructuring charges for engineering and systems software licenses in fiscal year 2017 were substantially offset by reduced severance and other restructuring charges.

Acquisition related charges

The composition of our Acquisition related charges, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Acquisition related charges	$1,531	$ 3,781	$ 6,305	(59.5)%	(40.0)%
Percentage of revenue	0.4 %	1.0 %	1.5 %		

Acquisition related charges include legal and professional fees directly related to acquisitions.

For fiscal years 2018, 2017, and 2016, Acquisition related charges were entirely attributable to legal fees and outside services in connection with our proposed acquisition by Canyon Bridge Acquisition Company, Inc. Although the acquisition was terminated, we had continued to incur certain residual legal charges directly related to this transaction. We do not expect any future costs related to this matter.

Impairment of acquired intangible assets

The composition of our Impairment of acquired intangible assets, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Impairment of acquired intangible assets	$12,486	$ 32,431	$ 7,866	(61.5)%	100+%
Percentage of revenue	3.1 %	8.4 %	1.8 %		

During our review of our strategic long-range plan completed at the end of the third quarter of fiscal 2018, we concluded that a certain product line had limited future revenue potential due to a decline in customer demand for that product. We determined that this conclusion constituted an impairment indicator to the related specific developed technology intangible asset acquired in our acquisition of Silicon Image. Our assessment of the fair value of this intangible asset concluded that it had been fully impaired as of September 29, 2018, and we recorded an impairment charge of $0.6 million in the Consolidated Statements of Operations.

In the second quarter of 2018, we made the strategic decision to discontinue our millimeter wave business, which included certain wireless technology intangible assets. We determined that this action constituted an impairment indicator related to certain of the developed technology intangible assets acquired in our acquisition of Silicon Image. Our assessment of the fair value of these intangible assets concluded that they had been fully impaired as of June 30, 2018, and we recorded an impairment charge of $11.9 million in the Consolidated Statements of Operations.

In the third quarter of fiscal 2017, we updated our annual strategic long-range plan, which resulted in revised forecasts. We also sold 100% of the equity of our Hyderabad, India subsidiary and transferred certain assets related to our Simplay Labs testing and certification business to an unrelated third party. We determined that these activities constituted impairment indicators related to certain of the developed technology intangible assets acquired in our acquisition of Silicon Image. Our assessment of the fair value of these intangible assets concluded that they had been impaired as of September 30, 2017, and we recorded a preliminary $36.2 million impairment charge in the Consolidated Statements of Operations. During the fourth quarter of fiscal 2017, we completed our detailed analysis and evaluation of the information and assumptions used in the determination of the impairment charge, which included reviewing information, inputs, assumptions, and valuation methodologies used to estimate the fair value of these intangible assets, and finalization of review by an independent valuation expert. As a result, we recorded a $3.8 million reduction to the preliminary impairment charge recorded in the third quarter of fiscal 2017, for a net impairment charge of $32.4 million in fiscal 2017.

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In September 2016, the founders of the HDMI consortium ("Founders"), of which we are a member, updated the Founders Agreement as part of a regular amendment process resulting in changes to our role as agent for the HDMI consortium and to the model for sharing adopter fee revenues. Under the terms of the amendment agreement, our role as the agent was terminated effective January 1, 2017 and a new independent entity was appointed to act as the new HDMI licensing agent with responsibility for licensing and the distribution of royalties among Founders. As a result of the amended model for sharing revenue, we will be entitled to a reduced share of adopter fees paid by parties adopting the HDMI standard. We determined that this modification constituted an impairment indicator related to the intangible assets acquired in the Silicon Image acquisition associated with future HDMI adopter fees. Our assessment of the fair value of these intangible assets concluded that they had been impaired as of October 1, 2016, and we recorded a $7.9 million impairment charge in the Consolidated Statements of Operations.

Gain on sale of building

In August 2017, we sold building space which we owned in Shanghai, China for gross proceeds of approximately $7.9 million. The building space was vacated in fiscal 2015 upon consolidation of facilities to a single site in Shanghai following our acquisition of Silicon Image. As of the sale date, the building had a historical cost of $3.6 million, accumulated depreciation of $1.4 million, and we incurred $1.1 million of direct selling costs, resulting in a net gain on sale of $4.6 million, which is presented as Gain on sale of building in our Consolidated Statements of Operations.

Interest Expense

The composition of our Interest expense, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Interest expense	$(20,600)	$(18,807)	$(20,327)	9.5%	(7.5)%
Percentage of revenue	(5.2)%	(4.9)%	(4.8)%		

Interest expense is primarily related to our debt acquired to partially fund the Silicon Image acquisition, which is further discussed in the Credit Arrangements section under Liquidity and Capital Resources. This interest expense is comprised of contractual interest and amortization of original issue discount and debt issuance costs based on the effective interest method.

The increase in Interest expense for fiscal 2018 compared to fiscal 2017 was largely driven by the increase in the effective interest rate on our long-term debt, partially offset by the reduction in the principal balance of our long-term debt as a result of the additional principal payments made during fiscal 2018.

The decrease in Interest expense for fiscal 2017 compared to fiscal 2016 was largely driven by the reduction in the principal balance of our long-term debt as a result of the additional principal payments made in the first six months of fiscal 2017.

Other (expense) income, net

The composition of our Other (expense) income, net, including as a percentage of revenue, is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Other (expense) income, net	$(249)	$(3,286)	$ 2,844	(92)%	100+%

Percentage of revenue	(0.1)%	(0.9)%	0.7 %

For fiscal 2018 compared to fiscal 2017, the change in Other (expense) income, net is primarily driven by non-recurrence in 2018 of the $1.8 million loss on the sale of 100% of the equity of our Hyderabad, India subsidiary and the transfer of certain assets related to our Simplay Labs testing and certification business to an unrelated third party in the third quarter of fiscal 2017. Additionally, in fiscal 2018, the impairment adjustments against our cost-method investment were approximately $1.5 million lower than in fiscal 2017.

As of December 30, 2017, we held a 22.7% preferred stock and convertible debt ownership interest in a privately-held company that designs human-computer interaction technology. We accounted for this investment under the cost method and assessed it for impairment as of December 30, 2017 by applying a fair value analysis using a revenue multiple approach. This yielded a fair value for our ownership stake of $2.3 million, which was less than its carrying value at the date of assessment. We determined that this impairment was other-than-temporary and adjusted the carrying value to the fair value. The total impairment adjustments against this cost-investment that we recognized in fiscal 2017 were $1.8 million.

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Additionally for fiscal 2017 compared to fiscal 2016, Other (expense) income, net is comprised of a $1.8 million loss on the sale of 100% of the equity of our Hyderabad, India subsidiary and certain assets related to our Simplay Labs testing and certification business to an unrelated third party, partially offset by a $0.3 million gain recognized in fiscal 2017 on the receipt of a final escrow payment released from the fiscal 2016 sale of Qterics.

Income taxes

The composition of our Income tax expense is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016	% Change in 2018	% Change in 2017
Income tax expense	$2,353	$ 849	$ 9,917	100+%	(91.4)%

Our Income tax expense for fiscal 2018 and fiscal 2017 is composed primarily of foreign income and withholding taxes, partially offset by benefits resulting from the release of uncertain tax positions due to statute of limitation expirations that occurred in the respective periods. The increase in expense in fiscal 2018 as compared to fiscal 2017 is primarily due to increased foreign withholding taxes related to HDMI royalty distributions received in fiscal 2018 coupled with a reduced benefit in the current year from the statute of limitation expiration.

The decrease in income tax expense in fiscal 2017 as compared to fiscal 2016 is primarily due to the decrease in foreign withholding taxes as a result of the termination of our role as the agent of the HDMI consortium.

We are not currently paying U.S. federal income taxes and do not expect to pay such taxes until we fully utilize our tax net operating loss and credit carryforwards. We expect to pay a nominal amount of state income tax. We are paying foreign income taxes, which are primarily related to withholding taxes on income from foreign royalties, foreign sales, and the cost of operating offshore research and development, marketing, and sales subsidiaries. We accrue interest and penalties related to uncertain tax positions in income tax expense on our Consolidated Statements of Operations. The inherent uncertainties related to the geographical distribution and relative level of profitability among various high and low tax jurisdictions make it difficult to estimate the impact of the global tax structure on our future effective tax rate.

The Tax Cuts and Jobs Act, enacted December 22, 2017, contains provisions that affect Lattice. Our new U.S. federal tax rate decreased from 35% to 21%. The new limitation on net interest expense will limit current deductibility of some of the interest on our debt, although this deduction may be carried forward for utilization in future years. The Global Intangible Low-Taxed Income (“GILTI”) may result in additional U.S. taxable income due to non-U.S. sourced income. To the extent we are required to recognize additional taxable income under these provisions, we have approximately $365 million in net operating loss carry forwards as of December 29, 2018 available for offset. Adoption of the territorial system concept will facilitate our ability to repatriate future foreign earnings without incurring additional U.S. tax. The new Base Erosion Anti-Abuse Tax (“BEAT”), which effectively requires U.S. companies with related non-U.S. persons to pay a minimum amount of U.S. tax, does not apply to us currently as we are below the $500 million revenue threshold.

Liquidity and Capital Resources

The following sections discuss the effects of changes in our Consolidated Balance Sheets and the effects of our credit arrangements and contractual obligations on our liquidity and capital resources, our share repurchase program, as well as our non-GAAP measures.

We classify our marketable securities as short-term based on their nature and availability for use in current operations. Our cash equivalents and short-term marketable securities consist primarily of high quality, investment-grade securities.

We have historically financed our operating and capital resource requirements through cash flows from operations. Cash provided by or used in operating activities will fluctuate from period to period due to fluctuations in operating results, the timing and collection of accounts receivable, and required inventory levels, among other things.

We believe that our financial resources will be sufficient to meet our working capital needs through at least the next 12 months. As of December 29, 2018, we did not have significant long-term commitments for capital expenditures. In the future, and to the extent our Credit Agreement permits, we may continue to consider acquisition opportunities to further extend our product or technology portfolios and further expand our product offerings. In connection with funding capital expenditures, completing other acquisitions, securing additional wafer supply, or increasing our working capital, we may seek to obtain equity or additional debt financing, or advance purchase payments or similar arrangements with wafer manufacturers. We may also need to obtain equity or additional debt financing if we experience downturns or cyclical fluctuations in our business that are more severe or longer than we anticipated when determining our current working capital needs, which financing may now be more difficult to obtain in light of our indebtedness related to the Credit Agreement.

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Liquidity

Cash and cash equivalents and Short-term marketable securities

(In thousands)	December 29, 2018	December 30, 2017	$ Change	%Change
Cash and cash equivalents	$ 119,051	$ 106,815	$12,236	11 %
Short-term marketable securities	9,624	4,982	4,642	93 %
Total Cash and cash equivalents and Short-term marketable securities	$ 128,675	$ 111,797	$16,878	15 %

As of December 29, 2018, we had total Cash, cash equivalents, and short-term marketable securities of $128.7 million, of which approximately $74.9 million in Cash and cash equivalents was held by our foreign subsidiaries. We manage our global cash requirements considering (i) available funds among the subsidiaries through which we conduct business, (ii) the geographic location of our liquidity needs, and (iii) the cost to access international cash balances. The repatriation of non-US earnings may require us to withhold and pay foreign income tax on the dividends. This should not result in significant additional tax expense as we have accrued expense based on current withholding rates. As of December 29, 2018, we could access all cash held by our foreign subsidiaries without incurring significant additional expense.

The net increase in Cash, cash equivalents, and short-term marketable securities of $16.9 million between December 30, 2017 and December 29, 2018, was primarily driven by $51.5 million in cash provided by operations, and $26.9 million cash provided by the issuance of common stock upon the exercise of stock options, net of withholding taxes on the vesting of RSUs, partially offset by $43.8 million cash used in the repayment of debt and $16.5 million of cash used in capital expenditures and payment for software licenses.

Accounts receivable, net

(In thousands)	December 29, 2018	December 30, 2017	$Change	%Change
Accounts receivable, net	$ 60,890	$ 55,104	$ 5,786	11 %
Days sales outstanding - Overall	58	53	5	

Accounts receivable, net as of December 29, 2018 increased by $5.8 million, or 10.5%, compared to December 30, 2017. A majority of the increase resulted from increased distributor revenue and billings to support the near-term demand from increasing server deployments and consumer applications, partially offset by the timing of collections and by additional ship and debit and return accruals recorded in fiscal 2018 due to adoption of ASC 606 that were not recorded as of the end of fiscal 2017.

The increase in overall days sales outstanding to 58 days at December 29, 2018 from 53 days at December 30, 2017 is mainly due the changes in distributor accounts receivable as a result of increased distributor inventory and adoption of ASC 606 discussed above.

Inventories

(In thousands)	December 29, 2018	December 30, 2017	$Change	%Change
Inventories	$ 67,096	$ 79,903	$(12,807)	(16)%
Months of inventory on hand	4.8	5.4	(0.6)	

Inventories as of December 29, 2018 decreased $12.8 million, or 16.0%, compared to December 30, 2017, primarily as a result of managing inventory levels based on improved system visibility of product demand and reductions resulting from our exit from the millimeter wave products business. These reductions were partially offset by an

increase related to the ramp up of a major new product.

The months of inventory on hand ratio compares the inventory balance at the end of a period to the cost of sales in that period. Our months of inventory on hand decreased to 4.8 months at December 29, 2018 from 5.4 months at December 30, 2017, as the cost of sales decreased between these periods while the inventory also decreased due to the reasons noted above.

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Credit Arrangements

On March 10, 2015, we entered into a secured credit agreement (the "Credit Agreement") with Jefferies Finance, LLC and certain other lenders for purposes of funding, in part, our acquisition of Silicon Image. The Credit Agreement provided for a $350 million term loan (the "Term Loan") maturing on March 10, 2021 (the "Term Loan Maturity Date"). We received $346.5 million, net of an original issue discount of $3.5 million and we paid debt issuance costs of $8.3 million. The Term Loan bears variable interest equal to the one-month LIBOR, subject to a 1.00% floor, plus a spread of 4.25%. The current effective interest rate on the Term Loan is 7.30%.

The Term Loan is payable through a combination of (i) quarterly installments of approximately $0.9 million, (ii) annual excess cash flow payments as defined in the Credit Agreement, which are due 95 days after the last day of our fiscal year, and (iii) any payments due upon certain issuances of additional indebtedness and certain asset dispositions, with any remaining outstanding principal amount due and payable on the Term Loan Maturity Date. The percentage of excess cash flow we are required to pay ranges from 0% to 75%, depending on our leverage and other factors as defined in the Credit Agreement. As of December 29, 2018, the Credit Agreement required a 75% excess cash flow payment.

In the first quarter of fiscal 2018, we made a required quarterly installment payment of $0.9 million. In the second quarter of fiscal 2018, we made a required excess cash flow payment of $0.2 million, a required quarterly installment payment of $0.9 million, and an additional $10.0 million principal payment. In the third quarter of fiscal 2018, we made a required quarterly installment payment of $0.9 million, and an additional $15.0 million principal payment. In the fourth quarter of fiscal 2018, we made a required quarterly installment payment of $0.9 million, and an additional $15.0 million principal payment. As of December 29, 2018, we had approximately $263.0 million outstanding under the Credit Agreement.

While the Credit Agreement does not contain financial covenants, it does contain informational covenants and certain restrictive covenants, including limitations on liens, mergers and consolidations, sales of assets, payment of dividends, and indebtedness. We were in compliance with all such covenants in all material respects at December 29, 2018.

As of December 29, 2018, we had no significant long-term purchase commitments for capital expenditures or existing used or unused credit arrangements.

Contractual Cash Obligations

The following table summarizes our contractual cash obligations at December 29, 2018:

(In thousands)

Fiscal year	Operating leases (1)	Long-term Debt (2)
2019	$ 7,090	$ 23,756
2020	6,893	74,331
2021	5,452	191,699
2022	4,658	—
2023	4,229	—
Thereafter	9,930	—
	$ 38,252	$ 289,786

(1) Certain of our facilities and equipment are leased under operating leases, which expire at various times through 2026.

(2) Cash payments due for long-term debt include estimated interest payments, which are based on outstanding principal amounts, currently effective interest rates as of December 29, 2018, timing of scheduled payments and the debt term. See Liquidity section of Item 7 for further discussion pertaining to our Credit Arrangements.

Our significant operating leases are for our facilities in Portland and Hillsboro, Oregon; San Jose, California; Muntinlupa City, Philippines; and Shanghai, China.

In November 2014, we entered into a lease for our former corporate headquarters facility in Portland, Oregon which expires in March 2025. Annual rental costs are estimated at $0.7 million with average annual increases of approximately 5%. We commenced operations at that location in March 2015. Under a previously approved restructuring plan, we plan to fully vacate the space in Portland, Oregon in early 2019 and intend to sublease the vacated space.

In November 2014, we sold the property where our headquarters was formerly located in Hillsboro, Oregon for net proceeds of $14.6 million. We leased back the majority of this facility from November 2014 until March 2015, after which we leased a smaller portion of the facility until November 2022. Annual rental costs are estimated at $0.6 million with 3% annual increases. In the first quarter of 2019, we relocated our corporate headquarters to our facility in Hillsboro, Oregon.

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Our lease in San Jose, California expires September 2026 with total annual rental costs estimated to be $2.4 million and annual increases of approximately 3%. Under a previously approved restructuring plan, we vacated approximately 50% or our facility in San Jose, California in the fourth quarter of fiscal 2018 and intend to sublease the vacated space.

Two of our leases in Muntinlupa City, Philippines expire in May 2025 and June 2025, with total annual rental costs estimated to be $0.7 million and annual increases of approximately 5%. Our lease in Shanghai expires in May 2021, with total annual rental costs estimated to be $1.8 million. Leasehold improvements are amortized over the shorter of the non-cancelable lease term or the estimated useful life of the assets.

New Accounting Pronouncements

The information contained under the heading "New Accounting Pronouncements" in Note 1 - Nature of Operations and Significant Accounting Policies to our Consolidated Financial Statements in Part II, Item 8 is incorporated by reference into this Part II, Item 7.

Off-Balance Sheet Arrangements

As of December 29, 2018, we did not have any off-balance sheet arrangements of the type described by Item 303(a)(4) of SEC Regulation S-K.

Non-GAAP Financial Measures

To supplement our consolidated financial results presented in accordance with U.S. Generally Accepted Accounting Principles ("GAAP"), we also present certain non-GAAP financial measures which are adjusted from the most directly comparable U.S. GAAP financial measures. The non-GAAP measures set forth below exclude charges and adjustments primarily related to stock-based compensation, restructuring plans and related charges, acquisition-related charges, amortization of acquired intangible assets, impairment of intangible assets, inventory adjustments from the discontinuation of the Company's millimeter wave business, gain on sale of building, gain or loss on sale of business unit, and the estimated tax effect of these items. These charges and adjustments may be recurring in nature but are a result of periodic or non-core operating activities of the Company.

Management believes that these non-GAAP financial measures provide an additional and useful way of viewing aspects of our performance that, when viewed in conjunction with our U.S. GAAP results, provide a more comprehensive understanding of the various factors and trends affecting our ongoing financial performance and operating results than GAAP measures alone. Management also uses these non-GAAP measures for strategic and business decision-making, internal budgeting, forecasting, and resource allocation processes and believes that investors should have access to similar data. In addition, these non-GAAP financial measures facilitate management’s internal comparisons to our historical operating results and comparisons to competitors’ operating results.

These non-GAAP measures are included solely for informational and comparative purposes and are not meant as a substitute for GAAP and should be considered together with the consolidated financial information located in this report. Pursuant to the requirements of Regulation S-K and to make clear to our investors the adjustments we make to U.S. GAAP measures, we have provided the following reconciliations of non-GAAP measures to the most directly comparable U.S. GAAP financial measures.

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Reconciliation of U.S. GAAP to Non-GAAP Financial Measures

(In thousands, except per share amounts) (unaudited)	Year Ended		
	December 29, 2018	December 30, 2017	December 31, 2016
Gross Margin Reconciliation			
GAAP Gross margin	$219,439	$216,579	$246,434
Inventory adjustment related to restructured operations	7,829	—	—
Acquisition related inventory fair-value effect (1)	—	—	523
Stock-based compensation expense - gross margin	940	788	888
Non-GAAP Gross margin	$228,208	$217,367	$247,845
Gross Margin % Reconciliation			
GAAP Gross margin %	55.0 %	56.1 %	57.7 %
Cumulative effect	2.2 %	0.2 %	0.3 %

of non-GAAP Gross Margin adjustments			
Non-GAAP Gross margin %	57.2 %	56.3 %	58.0 %
Operating Expenses Reconciliation			
GAAP Operating expenses	$222,559	$264,199	$273,133
Amortization of acquired intangible assets	(17,690)	(31,340)	(33,575)
Restructuring charges	(17,349)	(7,196)	(9,267)
Acquisition related charges (2)	(1,531)	(3,781)	(6,305)
Impairment of acquired intangible assets	(11,686)	(32,431)	(7,866)
Stock-based compensation expenses - operations	(12,706)	(11,755)	(15,325)
Gain on sale of building	—	4,624	—
Non-GAAP Operating expenses	$161,597	$182,320	$200,795
(Loss) Income from Operations Reconciliation			

GAAP Loss from operations	$(3,120)	$(47,620)	$(26,699)
Inventory adjustment related to restructured operations	7,829	—	—
Acquisition related inventory fair value effect (1)	—	—	523
Stock-based compensation expense - gross margin	940	788	888
Amortization of acquired intangible assets	17,690	31,340	33,575
Restructuring charges	17,349	7,196	9,267
Acquisition related charges	1,531	3,781	6,305
(2) Impairment of goodwill and acquired intangible assets	11,686	32,431	7,866
Stock-based compensation expense - operations	12,706	11,755	15,325
Gain on sale of building	—	(4,624)	—

Non-GAAP Income from operations	$66,611	$35,047	$47,050
(Loss) Income from Operations %			
Reconciliation GAAP Loss from operations %	(0.8)%	(12.3)%	(6.3)%
Cumulative effect of non-GAAP Gross Margin and Operating adjustments	17.5 %	21.4 %	17.3 %
Non-GAAP Income from operations %	16.7 %	9.1 %	11.0 %

(1) Fair value adjustment for inventory step-up from purchase accounting.

(2) Legal fees and outside services that were related to our proposed acquisition by Canyon Bridge Acquisition Company, Inc.

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Reconciliation of U.S. GAAP to Non-GAAP Financial Measures

(In thousands, except per share amounts) (unaudited)	Year Ended		
	December 29, 2018	December 30, 2017	December 31, 2016
Other (Expense) Income, Net Reconciliation			
GAAP Other (expense) income, net	$ (249)	$ (3,286)	$ 2,844
Loss (gain) on sale of assets and business units	—	1,496	(2,646)
Non-GAAP Other (expense) income, net	$ (249)	$ (1,790)	$ 198
Income Tax Expense Reconciliation			
GAAP Income tax expense	$ 2,353	$ 849	$ 9,917
Estimated tax effect of	—	—	

non-GAAP adjustments (3)		
Non-GAAP Income tax expense	$2,353	$ 849	$ 9,917
Net (Loss) Income Reconciliation		
GAAP Net loss	$(26,322)	$ (70,562)	$ (54,099)
Inventory adjustment related to restructured operations	7,829	—	—
Acquisition related inventory fair value effect (1)	—	—	523
Stock-based compensation expense - gross margin	940	788	888
Amortization of acquired intangible assets	17,690	31,340	33,575
Restructuring charges	17,349	7,196	9,267
Acquisition related charges (2)	1,531	3,781	6,305
Impairment of acquired intangible assets	11,686	32,431	7,866
	12,706	11,755	15,325

Stock-based compensation expense - operating expense	—	—	—
Gain on sale of building	—	(4,624)	—
Loss (gain) on sale of assets and business units	—	1,496	(2,646)
Estimated tax effect of non-GAAP adjustments (3)	—	—	—
Non-GAAP Net income	$ 43,409	$ 13,601	$ 17,004
Net (Loss) Income Per Share Reconciliation			
GAAP Net loss per share - basic	$ (0.21)	$ (0.58)	$ (0.45)
Cumulative effect of Non-GAAP adjustments	0.55	0.69	0.59
Non-GAAP Net	$ 0.34	$ 0.11	$ 0.14

income per share - basic			
GAAP Net (loss) income per share - diluted	$(0.21)	$ (0.58)	$ (0.45)
Cumulative effect of Non-GAAP adjustments	0.54	0.69	0.59
Non-GAAP Net income per share - diluted	$0.33	$ 0.11	$ 0.14
Shares used in per share calculations:			
Basic	126,564	122,677	119,994
Diluted - GAAP (4)	126,564	122,677	119,994
Diluted - non-GAAP (4)	129,766	124,499	121,957

(1) Fair value adjustment for inventory step-up from purchase accounting.

(2) Legal fees and outside services that were related to our proposed acquisition by Canyon Bridge Acquisition Company, Inc.

(3) We calculate non-GAAP tax expense by applying our tax provision model to

year-to-date and projected income after adjusting for non-GAAP items. The difference between calculated values for GAAP and non-GAAP tax expense has been included as the “Estimated tax effect of non-GAAP adjustments.” For the fiscal years presented, the calculated non-GAAP tax expense is equal to our GAAP tax expense, and the Estimated tax effect of non-GAAP adjustments is zero.

(4) Diluted shares are calculated using the GAAP treasury stock method. In a loss position, diluted shares equal basic shares.

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Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Exchange Rate Risk

While our revenues and the majority of our expenses are denominated in U.S. dollars, we collect an annual Japanese consumption tax refund in yen, and as a result of having various international subsidiary and branch operations, our financial position and results of operations are subject to foreign currency exchange rate risk.

We mitigate the resulting foreign currency exchange rate exposure by entering into foreign currency forward exchange contracts, details of which are presented in the following table:

	December 29, 2018	December 30, 2017
Total cost of contracts for Japanese yen (thousands)	$ 1,955	$ 2,204
Number of contracts	2	2
Settlement month	June 2019	June 2018

Although these hedges mitigate our foreign currency exchange rate exposure from an economic perspective, they were not designated as "effective" hedges under U.S. GAAP and as such are adjusted to fair value through Other (expense) income, net. We do not engage in speculative trading in any financial or capital market.

The net fair value of these contracts was favorable by approximately $0.1 million at both December 29, 2018 and December 30, 2017. A hypothetical 10% unfavorable exchange rate change in the yen against the U.S. dollar would have resulted in an unfavorable change in net fair value of approximately $0.2 million at both December 29, 2018 and December 30, 2017. Changes in fair value resulting from foreign exchange rate fluctuations would be substantially offset by the change in value of the underlying hedged transactions.

Interest Rate Risk

At December 29, 2018, we had $263.0 million outstanding on the $350 million gross term loan outstanding under our Credit Agreement, with a variable contractual interest rate based on the one-month LIBOR as of December 29, 2018, subject to a 1.00% floor, plus a spread of 4.25%. A hypothetical increase in the one-month LIBOR by 1% (100 basis points) would increase our future interest expense by approximately $2.6 million per year.

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Item 8. Financial Statements and Supplementary Data

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LATTICE SEMICONDUCTOR CORPORATION
CONSOLIDATED BALANCE SHEETS

(In thousands, except share and par value data)	December 29, 2018	December 30, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 119,051	$ 106,815
Short-term marketable securities	9,624	4,982
Accounts receivable, net of allowance for doubtful accounts	60,890	55,104
Inventories	67,096	79,903
Prepaid expenses and other current assets	27,762	16,567
Total current assets	284,423	263,371
Property and equipment, net	34,883	40,423
Intangible assets, net	21,325	51,308
Goodwill	267,514	267,514
Deferred income taxes	215	198
Other long-term assets	15,327	13,147
Total assets	$ 623,687	$ 635,961
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued expenses (includes restructuring)	$ 51,763	$ 54,405
Accrued payroll obligations	9,365	10,416
Current portion of long-term debt	8,290	1,508
Deferred income and allowances on sales to distributors	—	17,250
Deferred licensing and services revenue	—	68
Total current liabilities	69,418	83,647
Long-term debt	251,357	299,667
Other long-term liabilities	44,455	34,954
Total liabilities	365,230	418,268
Commitments and contingencies (Notes 13 and 19)	—	—
Stockholders' equity:		
Preferred stock, $.01 par value, 10,000,000 shares authorized, none issued and outstanding	—	—
Common stock, $.01 par value, 300,000,000 shares authorized; 129,728,000 shares issued and outstanding as of December 29, 2018 and 123,895,000 shares issued and outstanding as of December 30, 2017	1,297	1,239
Additional paid-in capital	736,274	695,768
Accumulated deficit	(476,783)	(477,862)
Accumulated other comprehensive loss	(2,331)	(1,452)
Total stockholders' equity	258,457	217,693
Total liabilities and stockholders' equity	$ 623,687	$ 635,961

The accompanying notes are an integral part of these Consolidated Financial Statements

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LATTICE SEMICONDUCTOR CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except per share data)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Revenue:			
Product	$380,468	$ 356,502	$ 390,704
Licensing and services	18,331	29,459	36,350
Total revenue	398,799	385,961	427,054
Costs and expenses:			
Cost of product revenue	179,101	164,657	179,983
Cost of licensing and services revenue	259	4,725	637
Research and development	82,449	103,357	117,518
Selling, general, and administrative	91,054	90,718	98,602
Amortization of acquired intangible assets	17,690	31,340	33,575
Restructuring charges	17,349	7,196	9,267
Acquisition related charges	1,531	3,781	6,305
Impairment of acquired intangible assets	12,486	32,431	7,866
Gain on sale of building	—	(4,624)	—
Total costs and expenses	401,919	433,581	453,753
Loss from operations	(3,120)	(47,620)	(26,699)
Interest expense	(20,600)	(18,807)	(20,327)
Other (expense) income, net	(249)	(3,286)	2,844
Loss before income taxes	(23,969)	(69,713)	(44,182)
Income tax expense	2,353	849	9,917
Net loss	$(26,322)	$ (70,562)	$ (54,099)
Net loss per share, basic and diluted	$(0.21)	$ (0.58)	$ (0.45)
Shares used in per share calculations, basic and diluted	126,564	122,677	119,994

The accompanying notes are an integral part of these Consolidated Financial Statements

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LATTICE SEMICONDUCTOR CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Net loss	$(26,322)	$ (70,562)	$ (54,099)
Other comprehensive loss:			
Unrealized gain (loss) related to marketable securities, net of tax	41	(73)	(172)
Reclassification adjustment for (gains) losses related to marketable securities included in other (expense) income, net	(18)	252	79
Translation adjustment, net of tax	(1,271)	2,620	(1,303)
Change in actuarial valuation of defined benefit pension	369	(95)	150
Comprehensive loss	$(27,201)	$ (67,858)	$ (55,345)

The accompanying notes are an integral part of these Consolidated Financial Statements

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LATTICE SEMICONDUCTOR CORPORATION
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In thousands, except par value data)	Common Stock ($.01 par value) Shares	Amount	Additional Paid-in capital	Accumulated deficit	Accumulated other comprehensive loss	Total
Balances, January 2, 2016	118,651	$1,187	$660,089	$(352,846)	$ (2,910)	$305,520
Net loss for 2016	—	—	—	(54,099)	—	(54,099)
Unrealized loss related to marketable securities, net of tax	—	—	—	—	(172)	(172)
Recognized loss on redemption of marketable securities, previously unrealized	—	—	—	—	79	79
Translation adjustments, net of tax	—	—	—	—	(1,303)	(1,303)
Common stock issued in connection with the exercise of stock options, ESPP and vested RSUs, net of tax	2,994	29	4,013	—	—	4,042
Stock-based compensation expense related to options, ESPP and RSUs	—	—	16,213	—	—	16,213
Defined benefit pension, net of actuarial valuation adjustments	—	—	—	—	150	150
Balances, December 31, 2016	121,645	$1,216	$680,315	$(406,945)	$ (4,156)	$270,430
Net loss for 2017	—	—	—	(70,562)	—	(70,562)
Unrealized loss related to marketable securities, net of tax	—	—	—	—	(73)	(73)
Recognized loss on redemption of marketable securities, previously unrealized	—	—	—	—	252	252
Translation adjustments, net of tax	—	—	—	—	2,620	2,620
Common stock issued in connection with the exercise of stock options, ESPP and vested RSUs, net of tax	2,250	23	2,795	—	—	2,818
Stock-based compensation expense related to stock options, ESPP and RSUs (1)	—	—	12,658	—	—	12,658
Defined benefit pension, net of actuarial valuation adjustments	—	—	—	—	(95)	(95)
Accounting method transition adjustment (2)	—	—	—	(355)	—	(355)
Balances, December 30, 2017	123,895	$1,239	$695,768	$(477,862)	$ (1,452)	$217,693
Net loss for 2018	—	—	—	(26,322)	—	(26,322)
Unrealized gain related to marketable securities, net of tax	—	—	—	—	41	41
Recognized gain on redemption of marketable securities, previously unrealized	—	—	—	—	(18)	(18)
Translation adjustments, net of tax	—	—	—	—	(1,271)	(1,271)
Common stock issued in connection with the exercise of stock options, ESPP and vested RSUs, net of tax	5,833	58	26,860	—	—	26,918
Stock-based compensation expense related to stock options, ESPP and RSUs	—	—	13,646	—	—	13,646
	—	—	—	—	369	369

Defined benefit pension, net of actuarial valuation adjustments						
Accounting method transition adjustment (3)	—	—	—	27,401	—	27,401
Balances, December 29, 2018	129,728	$ 1,297	$ 736,274	$ (476,783)	$ (2,331)	$ 258,457

(1) In the third quarter of fiscal 2017, in relation to the sale of 100% of the equity of our Hyderabad, India subsidiary and certain assets related to our Simplay Labs testing and certification business, certain stock compensation was accelerated due to a change of control agreement. As a result of this acceleration, the equity effect of stock compensation shown above includes approximately $0.1 million that was charged to restructuring expense as part of the June 2017 Plan (see "Note 15 - Restructuring").

(2) During the first quarter of fiscal 2017, we early adopted ASU 2016-16, Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory. This guidance is required to be applied on a modified retrospective basis through a cumulative-effect adjustment to the balance sheet as of the beginning of the fiscal year of adoption. As a result of this adoption, we recorded a nominal amount to Accumulated deficit, as detailed in the table above.

(3) As of the beginning of fiscal 2018, we adopted ASC 606, Revenue from Contracts With Customers, using the modified retrospective transition method. As a result of this adoption, we recorded a cumulative-effect adjustment to Accumulated deficit, as shown in the table above.

The accompanying notes are an integral part of these Consolidated Financial Statements

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LATTICE SEMICONDUCTOR CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Cash flows from operating activities:			
Net loss	$(26,322)	$ (70,562)	$ (54,099)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation and amortization	39,261	57,861	61,806
Impairment of acquired intangible assets	12,486	32,431	7,866
Amortization of debt issuance costs and discount	2,230	1,982	1,350
Change in deferred income tax provision	(96)	(154)	90
(Gain) loss on sale or maturity of marketable securities	(18)	252	79
Gain on forward contracts	(53)	(77)	(184)
Stock-based compensation expense	13,646	12,543	16,213
(Gain) loss on disposal of fixed assets	(178)	(75)	597
Gain on sale of building	—	(4,624)	—
Loss (gain) on sale of assets and business units	—	1,496	(2,646)
Impairment of cost-method investment	266	1,761	1,459
Changes in assets and liabilities:			
Accounts receivable, net	(3,978)	44,613	(11,419)
Inventories	13,177	(902)	(3,272)
Prepaid expenses and other assets	(11,667)	889	(2,270)
Accounts payable and accrued expenses (includes restructuring)	13,325	(23,588)	8,338
Accrued payroll obligations	(1,051)	726	402
Income taxes payable	498	(556)	3,216
Deferred income and allowances on sales to distributors	—	(15,007)	14,391
Deferred licensing and services revenue	(68)	(495)	(183)
Net cash provided by operating activities	51,458	38,514	41,734
Cash flows from investing activities:			
Proceeds from sales of and maturities of short-term marketable securities	5,000	12,689	14,897
Purchase of marketable securities	(9,603)	(7,420)	(7,490)
Proceeds from sale of building	—	7,895	—
Cash paid for costs of sale of building	—	(1,004)	—
Capital expenditures	(8,384)	(12,855)	(16,717)
Proceeds from sale of assets and business units, net of cash sold	—	967	1,972
Repayment received on short-term loan to cost-method investee	—	2,000	—
Short-term loan to cost-method investee	—	(2,000)	—
Cash paid for a cost-method investment	—	—	(1,000)
Cash paid for software licenses	(8,123)	(8,532)	(9,035)
Net cash used in investing activities	$(21,110)	$ (8,260)	$ (17,373)

The accompanying notes are an integral part of these Consolidated Financial Statements

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LATTICE SEMICONDUCTOR CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS (continued)

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Cash flows from financing activities:			
Restricted stock unit tax withholdings	$(2,370)	$ (3,267)	$ (3,565)
Proceeds from issuance of common stock	29,288	6,085	7,607
Repayment of debt	(43,759)	(35,429)	(5,154)
Net cash used in financing activities	$(16,841)	$ (32,611)	$ (1,112)
Effect of exchange rate change on cash	$(1,271)	$ 2,620	$ (1,303)
Net increase in cash and cash equivalents	12,236	263	21,946
Beginning cash and cash equivalents	106,815	106,552	84,606
Ending cash and cash equivalents	$119,051	$ 106,815	$ 106,552
Supplemental cash flow information:			
Change in unrealized (gain) loss related to marketable securities, net of tax, included in Accumulated other comprehensive loss	$(41)	$ 73	$ 172
Income taxes paid, net of refunds	$3,054	$ 2,387	$ 9,359
Interest paid	$18,607	$ 20,649	$ 18,159
Accrued purchases of property and equipment	$110	$ 588	$ 1,028
Note receivable resulting from sale of assets and business units	$—	$ 3,050	$ —

The accompanying notes are an integral part of these Consolidated Financial Statements

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LATTICE SEMICONDUCTOR CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1 - Nature of Operations and Significant Accounting Policies

Nature of Operations

Lattice Semiconductor and its subsidiaries (“Lattice,” the “Company,” “we,” “us,” or “our”) is a Delaware corporation that develops semiconductor technologies that we monetize through products, solutions, design services, and licenses. We engage in smart connectivity, control, and compute solutions, providing intellectual property ("IP") and low-power, small form-factor programmable logic devices that enable global customers to quickly and easily develop innovative, smart, and connected products. We help their products become more aware, interact more intelligently, and make better and faster connections. In an increasingly intense global technology market, we help our customers get their products to market faster than their competitors. Our broad end-market exposure extends from mobile devices and consumer electronics to industrial and automotive equipment, communications and computing infrastructure, and licensing and services. Lattice was founded in 1983 and is headquartered in Hillsboro, Oregon.

We do not manufacture our own silicon wafers. We maintain strategic relationships with large, established semiconductor foundries located in Asia to source our finished silicon wafers. In addition, all of our assembly operations and most of our test and logistics operations are performed by outside suppliers located in Asia. We perform certain test operations and reliability and quality assurance processes internally.

We place substantial emphasis on new product development and believe that continued investment in this area is required to maintain and improve our competitive position. Our product development activities emphasize new proprietary products, advanced packaging, enhancement of existing products and process technologies, and improvement of software development tools. Research and development activities occur primarily in: Hillsboro, Oregon; San Jose, California; Shanghai, China; and Muntinlupa City, Philippines.

Fiscal Reporting Period

We report based on a 52 or 53-week fiscal year ending on the Saturday closest to December 31. Our fiscal 2018, 2017, and 2016 were 52-week years that ended December 29, 2018, December 30, 2017, and December 31, 2016 respectively. Our fiscal 2019 will be a 52-week year and will end on December 28, 2019. All references to quarterly or yearly financial results are references to the results for the relevant fiscal period.

Principles of Consolidation

The accompanying Consolidated Financial Statements include the accounts of Lattice and its subsidiaries after the elimination of all intercompany balances and transactions.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles ("U.S. GAAP") requires management to make estimates and assumptions that affect the reported amounts and classification of assets, such as marketable securities, accounts receivable, contract assets (included in prepaid expenses and other current assets), inventory, goodwill (including the assessment of reporting units), intangible assets, current and deferred income taxes, accrued liabilities (including restructuring charges and bonus arrangements), disclosure of contingent assets and liabilities at the date of the financial statements, amounts used in acquisition valuations and purchase accounting, impairment assessments, the fair value of equity awards, and the reported amounts of product

revenue, licensing and services revenue, and expenses during the fiscal periods presented. Because of the uncertainty inherent in these matters, actual results could differ from those estimates.

Cash Equivalents and Marketable Securities

We consider all investments that are readily convertible into cash and that have original maturities of three months or less to be cash equivalents. Cash equivalents consist primarily of highly liquid investments in time deposits or money market accounts and are carried at cost. We account for marketable securities as available-for-sale investments, as defined by U.S. GAAP, and record unrealized gains or losses to Accumulated other comprehensive loss on our Consolidated Balance Sheets, unless losses are considered other than temporary, in which case, those are recorded directly to the Consolidated Statements of Operations and Consolidated Statements of Comprehensive Loss. Deposits with financial institutions at times exceed Federal Deposit Insurance Corporation insurance limits.

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Fair Value of Financial Instruments

We invest in various financial instruments, which may include corporate and government bonds, notes, and commercial paper. We value these instruments at their fair value and monitor our portfolio for impairment on a periodic basis. In the event that the carrying value of an investment exceeds its fair value and the decline in value is determined to be other than temporary, we would record an impairment charge and establish a new carrying value. We assess other-than-temporary impairment of marketable securities in accordance with Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") 820, "Fair Value Measurements." The framework under the provisions of ASC 820 establishes three levels of inputs that may be used to measure fair value. Each level of input has different levels of subjectivity and difficulty involved in determining fair value.

Level 1 instruments generally represent quoted prices for identical assets or liabilities in active markets. Therefore, determining fair value for Level 1 instruments generally does not require significant management judgment, and the estimation is not difficult. Our Level 1 instruments consist of U.S. Government agency obligations, corporate notes and bonds, and commercial paper that are traded in active markets and are classified as Short-term marketable securities on our Consolidated Balance Sheets.

Level 2 instruments include inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities, quoted prices for identical instruments in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Our Level 2 instruments consist of foreign currency exchange contracts, entered into to hedge against fluctuation in the Japanese yen.

Level 3 instruments include unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities. As a result, the determination of fair value for Level 3 instruments requires significant management judgment and subjectivity. We did not have any Level 3 instruments during the periods presented.

Foreign Exchange and Translation of Foreign Currencies

While our revenues and the majority of our expenses are denominated in U.S. dollars, we have international subsidiaries and branch operations that conduct some transactions in foreign currencies, and we collect an annual Japanese consumption tax refund in yen. Gains or losses from foreign exchange rate fluctuations on balances denominated in foreign currencies are reflected in Other (expense) income, net. Realized gains or losses on foreign currency transactions were not significant for the periods presented.

We translate accounts denominated in foreign currencies in accordance with ASC 830, "Foreign Currency Matters," using the current rate method under which asset and liability accounts are translated at the current rate, while stockholders' equity accounts are translated at the appropriate historical rates, and revenue and expense accounts are translated at average monthly exchange rates. Translation adjustments related to the consolidation of foreign subsidiary financial statements are reflected in Accumulated other comprehensive loss in Stockholders' equity (See our Consolidated Statements of Stockholders' Equity).

Derivative Financial Instruments

We mitigate foreign currency exchange rate risk by entering into foreign currency forward exchange contracts, details of which are presented in the following table:

	December 29, 2018	December 30, 2017

Total cost of contracts for Japanese yen (in thousands)	$ 1,955	$ 2,204
Number of contracts	2	2
Settlement month	June 2019	June 2018

Although these hedges mitigate our foreign currency exchange rate exposure from an economic perspective, they were not designated as "effective" hedges under U.S. GAAP and as such are adjusted to fair value through Other (expense) income, net, with gains of approximately $0.1 million for each of the years ended December 29, 2018 and December 30, 2017. We do not hold or issue derivative financial instruments for trading or speculative purposes.

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Concentration Risk

Potential exposure to concentration risk may impact revenue, trade receivables, marketable securities, and supply of wafers for our new products.

Customer concentration risk may impact revenue. The percentage of total revenue attributable to our top five identified end customers and largest identified end customer is presented in the following table:

	Year Ended		
	December 29, 2018	December 30, 2017	December 31, 2016
Revenue attributable to top five end customers	18 %	26 %	27 %
Revenue attributable to largest end customer	6.1 %	7.3 %	9.9 %

No end customer accounted for more than 10% of total revenue during these periods. We did not have enough information to assign end customers to approximately $14.1 million of revenue recognized for fiscal 2018 on shipments to distributors that have not sold through to end customers.

Distributors have historically accounted for a significant portion of our total revenue. Our two largest distributor groups, Arrow Electronics, Inc. ("Arrow") and the Weikeng Group ("Weikeng"), each account for substantial portions of our total revenue and our net trade receivables. Revenue attributable to distributors as a percentage of total revenue is presented in the following table:

	Year Ended		
	December 29, 2018	December 30, 2017	December 31, 2016
Arrow Electronics Inc.	29 %	24 %	24 %
Weikeng Group	25	27	22
All others	29	26	27
Revenue attributable to distributors*	83 %	77 %	73 %

* During the first quarter of 2018, we updated our channel categories to group all forms of distribution into a single channel. Prior periods have been reclassified to match the current period presentation.

At December 29, 2018 and December 30, 2017, Arrow accounted for 41% and 66%, respectively, and Weikeng accounted for 23% and 0%, respectively, of net trade receivables. No other distributor group or end customer accounted for more than 10% of net trade receivables at these dates.

Concentration of credit risk with respect to trade receivables is mitigated by our credit and collection process including active management of collections, credit limits, routine credit evaluations for essentially all customers, and secure transactions with letters of credit or advance payments where appropriate. We regularly review our allowance for doubtful accounts and the aging of our accounts receivable.

Accounts receivable do not bear interest and are shown net of allowances for doubtful accounts of $0.2 million and $9.4 million at December 29, 2018 and December 30, 2017, respectively. The allowance for doubtful accounts reflects our best estimate of probable losses inherent in the accounts receivable balance. We determine the allowance based on assessment of known troubled accounts, analysis of the aging of our accounts receivable, historical experience, management judgment, and other currently available evidence. We write off accounts receivable against the allowance when we determine a balance is uncollectible and no longer actively pursue collection of the receivable. During fiscal 2018, we wrote off $9.0 million of accounts receivable from a bankrupt distributor group. This write off had no impact on Accounts Receivable in fiscal 2018, as we had recorded a full allowance against our accounts receivable, net of deferred revenue, from the bankrupt distributor group in fiscal 2016, resulting in an increase in allowance for

doubtful accounts of $9.0 million and bad debt expense of $7.5 million in that fiscal year. Bad debt expense was negligible for both fiscal 2018 and 2017.

We place our investments primarily through one financial institution and mitigate the concentration of credit risk by limiting the maximum portion of the investment portfolio which may be invested in any one instrument. Our investment policy defines approved credit ratings for investment securities. Investments on-hand in marketable securities consisted primarily of money market instruments and U.S. government agency obligations. See "Note 4 - Marketable Securities" for a discussion of the liquidity attributes of our marketable securities.

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We rely on a limited number of foundries for our wafer purchases including Fujitsu Limited, Seiko Epson Corporation, Taiwan Semiconductor Manufacturing Company, Ltd, and United Microelectronics Corporation. We seek to mitigate the concentration of supply risk by establishing, maintaining and managing multiple foundry relationships; however, certain of our products are sourced from a single foundry and changing from one foundry to another can have a significant cost, among other factors.

Inventories and Cost of Product Revenue

Inventories are recorded at the lower of average cost determined on a first-in-first-out basis or market. We establish provisions for inventory if it is obsolete or we hold quantities which are in excess of projected customer demand. The creation of such provisions results in a write-down of inventory to net realizable value and a charge to cost of product revenue. Shipping and handling costs are included in Cost of product revenue in our Consolidated Statements of Operations.

Property and Equipment

Property and equipment are stated at cost. Depreciation and amortization are computed using the straight-line method for financial reporting purposes over the estimated useful lives of the related assets, generally three to five years for equipment and software, one to three years for tooling, and thirty years for buildings and building space. Leasehold improvements are amortized over the shorter of the non-cancelable lease term or the estimated useful life of the assets. Upon disposal of property and equipment, the accounts are relieved of the costs and related accumulated depreciation and amortization, and resulting gains or losses are reflected in the Consolidated Statements of Operations for recognized gains and losses, or in the Consolidated Balance Sheets for deferred gains and losses. Repair and maintenance costs are expensed as incurred.

Equity Investments in Privately Held Companies

Equity investments in privately held companies that we are not required to consolidate are accounted for under the cost method, as assessed under ASC 325-20, "Cost Method Investments." These investments are reviewed on a quarterly basis to determine if their values have been impaired and adjustments are recorded as necessary. We assess the potential impairment of these investments by applying a fair value analysis using a revenue multiple approach. Declines in value that are judged to be other-than-temporary are reported in Other (expense) income, net in the accompanying Consolidated Statements of Operations with a commensurate decrease in the carrying value of the investment (see "Note 11 - Cost Method Investment and Collaborative Arrangement"). Upon disposition of these investments, the specific identification method is used to determine the cost basis in computing realized gains or losses.

Impairment of Long-Lived Assets

Long-lived assets, including amortizable intangible assets, are carried on our financial statements based on their cost less accumulated depreciation or amortization. We monitor the carrying value of our long-lived assets for potential impairment and test the recoverability of such assets annually during the fourth quarter and whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. These events or changes in circumstances, including management decisions pertaining to such assets, are referred to as impairment indicators. If an impairment indicator occurs, we perform a test of recoverability by comparing the carrying value of the asset group to its undiscounted expected future cash flows. If the carrying values are in excess of undiscounted expected future cash flows, we measure any impairment by comparing the fair value of the asset group to its carrying value. Fair value is generally determined by considering (i) internally developed discounted projected cash flow analysis of the asset group; (ii) actual third-party valuations; and/or (iii) information available regarding the current market for similar

asset groups. If the fair value of the asset group is determined to be less than the carrying amount of the asset group, an impairment in the amount of the difference is recorded in the period that the impairment indicator occurs and is included in our Consolidated Statements of Operations. Estimating future cash flows requires significant judgment and projections may vary from the cash flows eventually realized, which could impact our ability to accurately assess whether an asset has been impaired. The results of our assessments are detailed in "Note 10 - Impairment of Acquired Intangible Assets."

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Valuation of Goodwill

Goodwill is an asset representing the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized. We review goodwill for impairment annually during the fourth quarter and whenever events or changes in circumstances indicate the carrying value of goodwill may not be recoverable. When evaluating whether goodwill is impaired, we make a qualitative assessment to determine if it is more likely than not that the reporting unit's fair value is less than the carrying amount. If the qualitative assessment determines that it is more likely than not that the fair value is less than the carrying amount, the fair value of the reporting unit is compared with its carrying value (including goodwill). If the fair value of the reporting unit is less than its carrying value, then goodwill impairment exists for the reporting unit. The impairment loss, if any, is recognized for the amount by which the carrying value exceeds the fair value. If the fair value of the reporting unit exceeds its carrying value, no further impairment analysis is needed. For purposes of testing goodwill for impairment, we currently operate as a single reporting unit: the core Lattice ("Core") business, which includes intellectual property and semiconductor devices. The results of our assessments are detailed in "Note 8 - Discontinuation of Business Unit, Sales of Assets and Business Units, and Goodwill."

Leases

The following describes our lease policy during fiscal 2018. In fiscal 2019, we will adopt ASU 2016-02, Leases (Topic 842). See "New Accounting Pronouncements" later in this Note 1 for a discussion of the impact of adoption on our accounting for leases.

We lease office space and classify our leases as either operating or capital lease arrangements in accordance with the criteria of ASC 840, “Leases.” Certain of our office space operating leases contain provisions under which monthly rent escalates over time and certain leases may also contain provisions for reimbursement of a specified amount of leasehold improvements. When lease agreements contain escalating rent clauses, we recognize expense on a straight-line basis over the term of the lease. When lease agreements provide allowances for leasehold improvements, we capitalize the leasehold improvement assets and amortize them on a straight-line basis over the lesser of the lease term or the estimated useful life of the asset, and reduce rent expense on a straight-line basis over the term of the lease by the amount of the asset capitalized.

Restructuring Charges

Expenses associated with exit or disposal activities are recognized when incurred under ASC 420, “Exit or Disposal Cost Obligations,” for everything but severance. When leased facilities are vacated, an amount equal to the total future lease obligations from the date of vacating the premises through the expiration of the lease, net of any future sublease income, is recorded as a part of restructuring charges. Expenses from other exit or disposal activities, including the cancellation of software contracts and engineering tools or the abandonment of long lived assets, is recorded as a part of restructuring charges. Because we have a history of paying severance benefits, the cost of severance benefits associated with a restructuring plan is recorded when such costs are probable and the amount can be reasonably estimated in accordance with ASC 712, “Compensation - Nonretirement Postemployment Benefits.”

Research and Development

Research and development expenses include costs for compensation and benefits, development masks, engineering wafers, depreciation, licenses, and outside engineering services. These expenditures are for the design of new products, intellectual property cores, processes, packaging, and software to support new products. Research and development costs are expensed as incurred.

Accounting for Income Taxes

Our provision for income tax is comprised of our current tax liability and changes in deferred tax assets and liabilities. Deferred tax assets and liabilities are recognized for the expected tax consequences of temporary differences between the tax bases of assets and liabilities and their reported amounts in the financial statements using enacted tax rates and laws that will be in effect when the difference is expected to reverse. Valuation allowances are provided to reduce deferred tax assets to an amount that in management's judgment is more-likely-than-not to be recoverable against future taxable income. The determination of a valuation allowance and when it should be released requires complex judgment.

In assessing the ability to realize deferred tax assets, we evaluate both positive and negative evidence that may exist and consider whether it is more-likely-than-not that some portion or all of the deferred tax assets will be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Any adjustment to the net deferred tax asset valuation allowance is recorded in the Consolidated Statements of Operations for the period that the adjustment is determined to be required.

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Our income tax calculations are based on application of the respective U.S. federal, state or foreign tax law. Our tax filings, however, are subject to audit by the relevant tax authorities. Accordingly, we recognize tax liabilities based upon our estimate of whether, and the extent to which, additional taxes will be due when such estimates are more-likely-than-not to be sustained. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained. To the extent the final tax liabilities are different than the amounts originally accrued, the increases or decreases as well as any interest or penalties are recorded as income tax expense or benefit in the Consolidated Statements of Operations.

U.S. tax reform required a deemed repatriation of foreign earnings as of December 30, 2017 and no future U.S. taxes will be due on these earnings because of enactment of a 100% dividends received deduction. Foreign earnings may be subject to withholding taxes in local jurisdictions if they are distributed and repatriated to Lattice in the United States.

Stock-Based Compensation

We use the Black-Scholes option pricing model to estimate the fair value of substantially all share-based awards consistent with the provisions of ASC 718, “Compensation - Stock Compensation.” Option pricing models, including the Black-Scholes model, require the use of input assumptions, including expected volatility, expected term, expected dividend rate, and expected risk-free rate of return. The assumptions for expected volatility and expected term most significantly affect the grant date fair value.

We have also granted stock options and RSUs with a market condition to certain executives. We determined and fixed the fair value of the awards with a market condition using a lattice-based option-pricing model. The valuation of these awards incorporated a Monte-Carlo simulation, and considered the likelihood that we would achieve the market condition. The awards with a market condition generally have a two- or three-year vesting period and vest between 0% and 250% of the target amount, based on the Company's relative Total Shareholder Return ("TSR") when compared to the TSR of a component of companies of the PHLX Semiconductor Sector Index over the measurement period. TSR is a measure of stock price appreciation plus dividends paid, if any, in the performance period. We have also granted RSUs with a performance condition to our President and Chief Executive Officer, which will vest and become payable based upon the Company’s generating specified “adjusted” EBITDA levels on a trailing four-quarter basis in any two consecutive trailing four-quarter periods. We valued the RSUs with a performance condition using the market price on the day of grant.

New Accounting Pronouncements

Recently Issued Accounting Standards

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which requires the recognition of assets and liabilities arising from lease transactions on the balance sheet and will also require significant additional disclosures about the amount, timing, and uncertainty of cash flows from leases. Substantially all leases, including current operating leases, will be recognized by lessees on their balance sheet as a lease asset for its right to use the underlying asset and a lease liability for the corresponding lease obligation. For public business entities, the standard is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. We will adopt this standard on its effective date. ASU 2016-02 initially required entities to adopt the standard using a modified retrospective transition method. In July 2018, the FASB issued certain updates including ASU 2018-11, Leases (Topic 842): Targeted Improvements, which provide optional transition practical expedients allowing companies to adopt the new standard with a cumulative effect adjustment as of the beginning of the year of adoption with prior year comparative financial information and disclosures remaining as previously reported. We plan to elect this optional practical expedient, and do not expect a material adjustment to beginning retained earnings.

We evaluated the transition and presentation approaches available as well as the impact of the new guidance on our consolidated financial statements and related disclosures, including the increase in the assets and liabilities on our balance sheet, and the impact on our current lease portfolio from both a lessor and lessee perspective. To facilitate this, we utilized a comprehensive approach to review our lease portfolio, as well as assessed system requirements and control implications. We expect to elect the ‘package of practical expedients’ that would allow us to carryforward our historical lease classifications, not reassess historical contracts to determine if they contain leases, and not reassess the initial direct costs for any existing leases. We also expect to elect further practical expedients that allow companies to account for leases based on the class of the underlying asset and not separate lease and non-lease components, and to not recognize right-of-use assets and lease liabilities for leases whose term to maturity upon inception is less than 12 months. Adoption of ASU 2016-02 is expected to result in the recognition of additional right-of-use assets and lease liabilities for operating leases in the range of $25 million to $30 million. We do not expect the new standard to have a material impact on our consolidated income statement, cash flows, or liquidity measures.

In August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities, which improves the financial reporting of hedging relationships to better portray the economic results of an entity’s risk management activities in its financial statements and simplifies the application of the hedge accounting guidance. This standard is effective for annual periods beginning after December 15, 2018, including interim periods within those annual periods, with early adoption permitted. We do not expect the adoption of this accounting standard update to have a material impact on our consolidated financial statements and related disclosures.

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In February 2018, the FASB issued ASU 2018-02, Income Statement-Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income. The new guidance allows an entity to reclassify the income tax effects of the Public Law 115-97 "An Act to Provide Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018", commonly known as the Tax Cuts and Job Act of 2017 (the "2017 Tax Act") on items within accumulated other comprehensive income/(loss) to accumulated deficit. This new guidance is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The new standard must be adopted retrospectively to each period in which a taxpayer recognizes the effect of the change in the U.S. federal corporate income tax rate from the 2017 Tax Act. We are currently assessing the impact of ASU 2018-02 on our consolidated financial statements and related disclosures.

In June 2018, the FASB issued ASU No. 2018-07, Compensation-Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting, which largely aligns the measurement and classification guidance for share-based payments to nonemployees with the guidance for share-based payments to employees. The ASU also clarifies that any share-based payment issued to a customer should be evaluated under ASC 606, Revenue from Contracts with Customers. The ASU requires a modified retrospective transition approach. This new guidance is effective for fiscal years beginning after December 15, 2018, including interim periods within that fiscal year. We do not expect the adoption of this accounting standard update to have a material impact on our consolidated financial statements and related disclosures.

In August 2018, the FASB issued ASU 2018-15, Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40), which clarifies the accounting for implementation costs in cloud computing arrangements. This guidance is effective for interim and annual reporting periods beginning after December 15, 2019, and early adoption is permitted. We are currently assessing the impact of ASU 2018-15 on our consolidated financial statements and related disclosures.

Note 2 - Revenue from Contracts with Customers

We adopted ASC 606 effective on December 31, 2017, the first day of our 2018 fiscal year, using the modified retrospective method. Under the guidance in effect prior to the adoption of ASC 606, we deferred the recognition of revenue and the cost of revenue from certain sales until the distributors of our products reported that they had sold the products to their customers, at which point the selling price of these products became fixed and determinable (known as “sell-through” revenue recognition). Under ASC 606, we recognize revenue on sales to all distributors when control of the products transfers to the distributors, and we estimate the transaction price to which we ultimately expect to be entitled. Under ASC 606, we will also recognize certain licensing revenues that were not recognizable under previous GAAP due to the fixed and determinable revenue recognition criteria not being met. Under the modified retrospective transition method, we have not restated any prior financial statements presented. As a result of this adoption, we revised our accounting policy for revenue recognition as detailed below.

We recognize revenue under the core principle of depicting the transfer of control to our customers in an amount reflecting the consideration we expect to be entitled. In order to achieve that core principle, we apply the following five step approach, as further described below: (1) identify the contract with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to each performance obligation in the contract, and (5) recognize revenue when applicable performance obligations are satisfied.

Product Revenue

Identify the contract with a customer - Our product revenues consist of sales to original equipment manufacturers, or OEMs, and distributors. We consider customer purchase orders, which in some cases are governed by master sales

agreements, to be the contracts with a customer. In certain cases we consider firm forecasts that are agreed to by both us and the customer to be contracts. For sales to distributors, we have concluded that our contracts are with the distributor, rather than with the distributor's end customer, as we hold a contract bearing enforceable rights and obligations only with the distributor. As part of our consideration of the contract, we evaluate certain factors including the customer's ability to pay (or credit risk).

Identify the performance obligations in the contract - For each contract, we consider our promise to transfer each distinct product to be the identified performance obligations.

Determine the transaction price - In determining the transaction price, we evaluate whether the set contract price is subject to refund or adjustment to determine the net consideration to which we expect to be entitled. As our standard payment terms are less than one year, we have elected to apply the practical expedient to not assess whether a contract has a significant financing component.

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Sales to most distributors are made under terms allowing certain price adjustments and limited rights of return of our products held in their inventory or upon sale to their end customers. Revenue from sales to distributors is recognized upon the transfer of control to the distributor, which generally occurs upon shipment of product to the distributor. Frequently, distributors need to sell at a price lower than the standard distribution price in order to win business. At the time the distributor invoices its customer or soon thereafter, the distributor submits a “ship and debit” price adjustment claim to us to adjust the distributor’s cost from the standard price to the pre-approved lower price. After we verify that the claim was pre-approved, we issue a credit memo to the distributor for the ship and debit claim. In determining the transaction price, we consider ship and debit price adjustments to be variable consideration. Such price adjustments are estimated using the expected value method based on an analysis of historical ship and debit claims, at the distributor and product level, over a period of time considered adequate to account for current pricing and business trends, typically 6 months. Any differences between the estimated consideration and the actual amount received from the customer is recorded in the period that the actual consideration becomes known. Most of our distributors are entitled to limited rights of return, referred to as stock rotation, not to exceed 5% of billings, net of returns and ship and debit price adjustments. Stock rotation reserves are based on historical return rates and recorded as a reduction to revenue with a corresponding reduction to cost of goods sold for the estimated cost of inventory that we expect to be returned.

Sales to OEMs and certain distributors are made under terms that do not include rights of return or price concessions after we ship the product. Accordingly, the transaction price equals the invoice price and there is no variable consideration.

Allocate the transaction price to each performance obligation in the contract - Because our product revenue contracts generally include the delivery of a certain quantity of semiconductors as the single performance obligation, we do not allocate revenue across distinct performance obligations. However, we frequently receive orders for products to be delivered over multiple dates that may extend across several reporting periods. We invoice for each delivery upon shipment and recognize revenues for each distinct product delivered, assuming transfer of control has occurred. Payment term for invoices are generally 30 to 60 days.

Recognize revenue when applicable performance obligations are satisfied - Revenue is recognized when control of the product is transferred to the customer (i.e., when our performance obligation is satisfied), which typically occurs at shipment. In determining whether control has transferred, we also consider if there is a present right to payment and legal title, along with whether the risks and rewards of ownership have transferred to the customer. We have certain vendor-managed inventory arrangements with certain OEM customers whereby we ship product into an inventory hub location but for which control does not transfer until the customer consumes the inventory. In such cases, we recognize revenue upon customer consumption.

Licensing and Services Revenue

Identify the contract with a customer - Our Licensing and services revenue is comprised of revenue from our intellectual property ("IP") core licensing activity, patent monetization activities, design services, and royalty and adopter fee revenue from our standards activities. These activities are complementary to our product sales and help us to monetize our IP associated with our technology and standards. We consider licensing arrangements with our customers to be the contract.

Identify the performance obligations in the contract - For each contract, we consider the promise to deliver a license that grants the customer the right to use the IP, as well as any professional services provided under the contract, as distinct performance obligations.

Determine the transaction price - Our HDMI and MHL standards revenue, as well as certain IP licenses, include variable consideration in the form of usage-based royalties. We apply the provisions of ASC 606 in accounting for these types of arrangements, whereby we do not include estimated royalties in the transaction price at the origination of the contract but rather recognize royalty revenue as usage occurs.

HDMI royalty revenue is determined by a contractual allocation formula agreed to by the Founders of the HDMI consortium. The contractual allocation formula is subject to periodic adjustment, generally every three years. The most recent royalty sharing formula covered the period from January 1, 2014 through December 31, 2016, and an interim agreement covering the period from January 1, 2017 through December 31, 2017 was signed in the second quarter of fiscal 2018. However, a new agreement covering the period beginning January 1, 2018 is yet to be signed. While a new royalty sharing agreement is being negotiated with the other Founders of the HDMI consortium, the HDMI agent is unable to distribute the majority of the royalties collected to the Founders. We are recording revenue based on our estimated share of the royalties, which we determine using an analytical model that combines historical and forecasted collection trends with our expected share of those collections. This estimate will be adjusted once the Founders finalize the agreement for the period beginning January 1, 2018.

Allocate the transaction price to each performance obligation in the contract - For contracts that include multiple performance obligations (most commonly those that include licenses and professional services, but which also may include inventory), we allocate revenue to each performance obligation based on the best estimate of the standalone selling price of each obligation. We do not believe that the judgments regarding the allocation of revenue on licensing arrangements are material to our financial statements.

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Recognize revenue when applicable performance obligations are satisfied - We recognize license revenue at the point in time that control of the license transfers to the customer, which is generally upon delivery. We recognize professional service revenue as we perform the services. Royalty revenues are recognized as customers sell products that include our IP and are legally obligated to remit royalties to us. We receive payments from customers based on contractual billing schedules. Accounts receivable are recorded when the right to consideration becomes unconditional. Payment terms on invoiced amounts are typically 30 days.

Impact on Financial Statements

We adopted ASC 606 on December 31, 2017, the first day of our 2018 fiscal year, using the modified retrospective method. Under this transition method, we applied the provisions of the new standard to all open customer contracts as of the date of adoption and recorded the cumulative effect of adoption to Accumulated deficit on December 31, 2017. We have not restated any prior financial statements presented. ASC 606 requires us to disclose the effect of adoption on each financial statement line item in the current reporting period during 2018 as compared to the revenue recognition accounting standard that was in effect in 2017, and an explanation of the reasons for significant changes. Such information is as follows:

Condensed Consolidated Statement of Operations

	Year ended December 29, 2018		
(In thousands, except per share data)	As reported under new standard	Adjustments	Pro forma as if previous standard was in effect
Product revenue	380,468	(14,098)	366,370
Licensing and services revenue	18,331	(1,478)	16,853
Cost of product revenue	179,101	(6,399)	172,702
Net loss	(26,322)	(9,177)	(35,499)
Net loss per share, basic and diluted	(0.21)	(0.07)	(0.28)

Condensed Consolidated Balance Sheets

	As of December 29, 2018		
(In thousands)	As reported under new standard	Adjustments	Pro forma as if previous standard was in effect
Accounts receivable, net of allowance for doubtful accounts	60,890	6,600	67,490
Inventories	67,096	78	67,174
Prepaid expenses and other current assets	27,762	(9,775)	17,987
Total assets	623,687	(3,097)	620,590
Accounts payable and accrued expenses (includes restructuring)	51,763	(1,156)	50,607
Deferred income and allowances on sales to distributors	—	34,637	34,637
Accumulated deficit	(476,783)	(36,578)	(513,361)

Total liabilities and stockholders' equity	623,687	(3,097)	620,590

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Condensed Consolidated Statement of Cash Flows

	Year ended December 29, 2018		
(In thousands)	As reported under new standard	Adjustments	Pro forma as if previous standard was in effect
Cash flows from operating activities:			
Net loss	(26,322)	(9,177)	(35,499)
Accounts receivable, net	(3,978)	(8,408)	(12,386)
Inventories	13,177	(448)	12,729
Prepaid expenses and other assets	(11,667)	2,260	(9,407)
Accounts payable and accrued expenses (includes restructuring)	13,325	(1,614)	11,711
Deferred income and allowances on sales to distributors	—	17,387	17,387

The significant impacts of the new standard were to accelerate the recognition of revenues on both sales to certain distributors and certain licensing activities. As a result of adopting this standard, we recorded a cumulative effect adjustment of $27.4 million as a reduction to Accumulated deficit on December 31, 2017, resulting primarily from a net $20.2 million of previously deferred distributor revenues and costs and $6.6 million of previously unrecognized licensing revenues.

Other Matters

We generally provide an assurance warranty that our products will substantially conform to the published specifications for twelve months from the date of shipment. In some case the warranty period may be longer than twelve months. We do not separately price or sell the assurance warranty. Our liability is limited to either a credit equal to the purchase price or replacement of the defective part. Returns under warranty have historically been immaterial. As such, we do not record a specific warranty reserve or consider activities related to such warranty, if any, to be a separate performance obligation.

Under the practical expedient provided by ASC 340, we generally expense sales commissions when incurred because the amortization period would have been less than one year. We record these costs within Selling, general, and administrative expenses.

Substantially all of our performance obligations are satisfied within twelve months. Accordingly, under the optional exemption provided by ASC 606, we do not disclose revenues allocated to future performance obligations of partially completed contracts.

We do not have any material contract liabilities recorded as of December 29, 2018.

Contract assets relate to our rights to consideration for licenses and royalties due to us as a member of the HDMI consortium, with collection dependent on events other than the passage of time, such as collection of licenses and royalties from customers by the HDMI licensing agent and the finalization of a new royalty sharing agreement. The contract assets are recorded in Prepaid expenses and other current assets in our Consolidated Balance Sheets, and they are transferred to Accounts receivable when the rights become unconditional. In addition to collections related to current year revenue, we received $6.4 million in cash during the second quarter of fiscal 2018 for fiscal 2017 HDMI royalties as a result of the signing of the HDMI Founders royalty sharing agreement for 2017. Collection of this

amount had no impact on our reported revenues as it had been accrued to our cumulative effect adjustment, and it was recorded as a reduction to the contract asset during the quarter received.

The following table summarizes the activity for our contract assets during fiscal 2018:

(In thousands)	
Balance as of December 31, 2017	$7,515
Revenues recorded during the period	11,618
Transferred to accounts receivable or collected	(9,990)
Balance as of December 29, 2018	$9,143

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Disaggregation of Revenue

The following tables provide information about revenue from contracts with customers disaggregated by major class of revenue and by geographical market, based on ship-to location of the end customer, where available, and ship-to location of distributor otherwise:

Major Class of Revenue (In thousands)	Year Ended * December 29, 2018	December 30, 2017	December 31, 2016
Product revenue - Distributors	330,719	297,736	310,163
Product revenue - Direct	49,749	58,766	80,541
Licensing and services revenue	18,331	29,459	36,350
Total revenue	398,799	385,961	427,054

Revenue by Geographical Market (In thousands)	Year Ended * December 29, 2018	December 30, 2017	December 31, 2016
Asia	298,119	277,638	305,093
Europe	45,546	44,547	59,835
Americas	55,134	63,776	62,126
Total revenue	398,799	385,961	427,054

* As noted above, amounts in periods prior to fiscal 2018 have not been adjusted under the modified retrospective method of adopting ASC 606 and, therefore, are presented under GAAP in effect during that period.

Note 3 - Net Loss Per Share

We compute basic Net loss per share by dividing Net loss by the weighted average number of common shares outstanding during the period. To determine diluted share count, we apply the treasury stock method to determine the dilutive effect of outstanding stock option shares, restricted stock units ("RSUs"), and Employee Stock Purchase Plan ("ESPP") shares. Our application of the treasury stock method includes, as assumed proceeds, the average unamortized stock-based compensation expense for the period. When we are in a net loss position, we do not include dilutive securities as their inclusion would reduce the net loss per share.

A summary of basic and diluted Net loss per share is presented in the following table:

(in thousands, except per share data)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Net loss	$(26,322)	$ (70,562)	$ (54,099)
Shares used in basic and diluted net loss per share	126,564	122,677	119,994
Basic and diluted net loss per share	$(0.21)	$ (0.58)	$ (0.45)

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The computation of diluted Net loss per share excludes the effects of stock options, RSUs, and ESPP shares that are antidilutive, aggregating approximately the following number of shares:

(in thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Stock options, RSUs, and ESPP shares excluded as they are antidilutive	7,567	6,622	8,978

Stock options, RSUs, and ESPP shares are considered antidilutive when the aggregate of exercise price and unrecognized stock-based compensation expense are greater than the average market price for our common stock during the period or when we are in a net loss position, as the effects would reduce the loss per share. Stock options, RSUs, and ESPP shares that are antidilutive at December 29, 2018 could become dilutive in the future.

Note 4 - Marketable Securities

We classify our marketable securities as short-term based on their nature and availability for use in current operations. In the periods presented, our Short-term marketable securities consisted of government bonds with contractual maturities of up to two years. The following table summarizes the remaining maturities of our Short-term marketable securities at fair value:

(In thousands)	December 29, 2018	December 30, 2017
Short-term marketable securities:		
Maturing within one year	$ 7,454	$ 4,982
Maturing between one and two years	2,170	—
Total marketable securities	$ 9,624	$ 4,982

Note 5 - Fair Value of Financial Instruments

	Fair value measurements as of December 29, 2018				Fair value measurements as of December 30, 2017			
(In thousands)	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Short-term marketable securities	$9,624	$9,624	$ —	$ —	$4,982	$4,982	$ —	$ —
Foreign currency forward exchange contracts, net	53	—	53	—	77	—	77	—
Total fair value of financial instruments	$9,677	$9,624	$ 53	$ —	$5,059	$4,982	$ 77	$ —

We invest in various financial instruments that may include corporate and government bonds and notes, commercial paper, and certificates of deposit. In addition, we enter into foreign currency forward exchange contracts to mitigate our foreign currency exchange rate exposure. We carry these instruments at their fair value in accordance with ASC 820, "Fair Value Measurements." The framework under the provisions of ASC 820 establishes three levels of inputs that may be used to measure fair value. Each level of input has different levels of subjectivity and difficulty involved in determining fair value, as summarized in "Note 1 - Nature of Operations and Significant Accounting Policies." There were no transfers between any of the levels during fiscal 2018, 2017, and 2016.

In accordance with ASC 320, “Investments-Debt and Equity Securities,” we recorded an unrealized gain of less than $0.1 million during the fiscal year ended December 29, 2018, and an unrealized loss of approximately $0.1 million during the fiscal year ended December 30, 2017 on certain Short-term marketable securities (Level 1 instruments), which have been recorded in Accumulated other comprehensive loss. Future fluctuations in fair value related to these instruments that we deem to be temporary, including any recoveries of previous write-downs, would be recorded to

Accumulated other comprehensive loss. If we were to determine in the future that any further decline in fair value is other-than-temporary, we would record an impairment charge, which could have a material adverse effect on our operating results. If we were to liquidate our position in these securities, it is likely that the amount of any future realized gain or loss would be different from the unrealized gain or loss reported in Accumulated other comprehensive loss.

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Note 6 - Inventories

(In thousands)	December 29, 2018	December 30, 2017
Work in progress	$ 47,224	$ 49,642
Finished goods	19,872	30,261
Total inventories	$ 67,096	$ 79,903

In the second quarter of 2018, we made the strategic decision to discontinue our millimeter wave business, which included certain wireless technology inventory items. As such, specific inventory reserves of $8.0 million were taken during fiscal 2018 on product lines that were eliminated with the discontinuation of our millimeter wave business and were charged to Cost of product revenue in the Consolidated Statements of Operations.

Note 7 - Property and Equipment

(In thousands)	December 29, 2018	December 30, 2017
Production equipment and software	160,979	155,492
Leasehold improvements	12,648	13,277
Office furniture and equipment	2,623	2,914
	176,250	171,683
Accumulated depreciation and amortization	(141,367)	(131,260)
	$ 34,883	$ 40,423

For fiscal year 2018, depreciation and amortization expense for property and equipment was $13.4 million, including $0.6 million of restructuring expense. For fiscal years 2017 and 2016, depreciation and amortization expense for property and equipment was $16.3 million and $18.4 million, respectively.

In August 2017, we sold building space which we owned in Shanghai, China for gross proceeds of approximately $7.9 million. The building space was vacated in fiscal 2015, upon consolidation of facilities to a single site in Shanghai following our acquisition of Silicon Image. As of the sale date, the building had a historical cost of $3.6 million, accumulated depreciation of $1.4 million and we incurred $1.1 million of direct selling costs, resulting in a net gain on sale of $4.6 million, which is presented as Gain on sale of building in our Consolidated Statements of Operations.

Note 8 - Discontinuation of Business Unit, Sales of Assets and Business Units, and Goodwill

Discontinuation of Business Unit

In the second quarter of 2018, we made the strategic decision to discontinue our millimeter wave business, which included certain assets related to our Wireless products, and our Board of Directors approved a related internal restructuring plan. This action was designed to improve profitability, reduce our infrastructure costs, and re-focus on our core business activities. Approximately $24.1 million of total expense was recorded in our Consolidated Statements of Operations in fiscal 2018, including $11.9 million charged to Impairment of acquired intangible assets, $8.0 million charged to Cost of product revenue for inventory reserves, and $4.2 million charged to Restructuring charges for severance and other personnel costs, and for other asset restructuring. See "Note 6 - Inventories," "Note 10 - Impairment of Acquired Intangible Assets," and "Note 15 - Restructuring" for further details on the charges and costs related to the discontinuation of our millimeter wave business.

Sales of Assets and Business Units

On September 30, 2017, in conjunction with our June 2017 restructuring plan (see "Note 15 - Restructuring"), we sold 100% of the equity of our Hyderabad, India subsidiary and transferred certain assets related to our Simplay Labs testing and certification business to Invecas, Inc. The fair value of purchase price consideration was $5.3 million, which was comprised of $2.3 million of cash and a $3.0 million note receivable. In the third quarter of fiscal 2017, we recorded a $1.8 million loss on the sale, including a $2.2 million disposal of a relative fair value share of our Goodwill, which is included in Other (expense) income, net in the Consolidated Statements of Operations.

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In April 2016, we sold Qterics to an unrelated third party for net proceeds of $2.0 million, net of cash sold, resulting in a gain of $2.6 million. The gain was included in Other (expense) income, net in the Consolidated Statements of Operations in the period of sale. In the second quarter of fiscal 2017, we received a final escrow payment of $0.3 million related to the sale of Qterics, which was included as a gain in Other (expense) income, net in the Consolidated Statements of Operations for the period of receipt.

Goodwill

Goodwill represents the excess of the purchase price over the fair value of the underlying net tangible and intangible assets. Goodwill is not amortized, but is instead tested for impairment annually or more frequently if certain indicators of impairment are present. We do not expect goodwill impairment to be tax deductible for income tax purposes.

We determined that the strategic decision to discontinue our millimeter wave business in the second quarter of 2018 constituted a triggering event related to goodwill, and we evaluated our goodwill balance as of June 30, 2018. We concluded that goodwill was not impaired, and no impairment charges relating to goodwill were recorded for fiscal 2018. No impairment charges relating to goodwill were recorded for either fiscal 2017 or fiscal 2016 as no indicators of impairment were present.

Our asset sale to Invecas, Inc. in September 2017 included a $2.2 million disposal of a relative fair value share of our Goodwill, which is included in Other (expense) income, net in the Consolidated Statements of Operations.

Note 9 - Intangible Assets

In connection with our acquisitions of Silicon Image, Inc. in March 2015 and SiliconBlue Technologies, Inc. in December 2011, we recorded identifiable intangible assets related to developed technology, customer relationships, licensed technology, patents, and in-process research and development based on guidance for determining fair value under the provisions of ASC 820, "Fair Value Measurements." Additionally, during fiscal years 2015, 2017, and 2018, we licensed additional third-party technology. We do not believe there is any significant residual value associated with these intangible assets. We are amortizing the intangible assets using the straight-line method over their estimated useful lives.

During the first quarter of fiscal 2017, we sold a portfolio of patents that had been acquired in our acquisition of Silicon Image for $18.0 million. This amount was received in two installments over the first and second quarters of fiscal 2017, and was recognized as Licensing and services revenue in our Consolidated Statements of Operations during the respective periods in which the installment payments were received. As a result of this transaction, Intangible assets, net was reduced by approximately $3.5 million on our Consolidated Balance Sheets.

We monitor the carrying value of our intangible assets for potential impairment and test the recoverability of such assets annually during the fourth quarter and whenever triggering events or changes in circumstances indicate that their carrying amounts may not be recoverable. The results of our assessments are summarized below and more fully detailed in "Note 10 - Impairment of Acquired Intangible Assets."

During the third quarter of fiscal 2018, we concluded that a certain product line had limited future revenue potential due to a decline in customer demand for that product, and we recorded an impairment charge of $0.6 million to the intangible asset associated with that product. In the second quarter of 2018, we made the strategic decision to discontinue our millimeter wave business, which included certain wireless technology intangible assets, and we recorded an impairment charge of $11.9 million to the intangible assets associated with this business. During the fourth quarter of fiscal 2017, we finalized our impairment assessment procedures related to certain of the developed technology intangible assets acquired in our acquisition of Silicon Image, resulting in a $3.8 million reduction to the

preliminary impairment charge of $36.2 million recorded in the third quarter of fiscal 2017, for a net impairment charge of $32.4 million in fiscal 2017. During the third quarter of fiscal 2016, we recorded a $7.9 million impairment charge to the intangible assets associated with future HDMI adopter fees.

The following tables summarize the details of our Intangible assets, net as of December 29, 2018 and December 30, 2017:

	December 29, 2018				
(In thousands)	Weighted Average Amortization Period (in years)	Gross	Impairment	Accumulated Amortization	Intangible assets, net
Developed technology	5.0	$112,269	$(12,486)	$(83,185)	$16,598
Customer relationships	5.8	22,934	—	(19,048)	3,886
Licensed technology	5.0	1,195	—	(354)	841
Total identified intangible assets		$136,398	$(12,486)	$(102,587)	$21,325

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	December 30, 2017			
(In thousands)	Weighted Average Amortization Period (in years)	Gross	Impairment	Accumulated Amortization	Intangible assets, net
Developed technology	4.7	$158,700	$(32,431)	$(81,847)	$44,422
Customer relationships	5.7	22,934	—	(16,696)	6,238
Licensed technology	3.5	2,392	—	(1,744)	648
Total identified intangible assets		$184,026	$(32,431)	$(100,287)	$51,308

We recorded amortization expense related to intangible assets on the Consolidated Statements of Operations as presented in the following table:

	Year Ended		
(In thousands)	December 29, 2018	December 30, 2017	December 31, 2016
Research and development	$277	$ 569	$ 745
Amortization of acquired intangible assets	17,690	31,340	33,575
	$17,967	$ 31,909	$ 34,320

The annual expected amortization expense of acquired intangible assets is as follows:

(In thousands)	Amount
2019	13,613
2020	4,499
2021	2,239
2022	238
Thereafter	736
Total	$21,325

Note 10 - Impairment of Acquired Intangible Assets

In connection with our acquisitions of Silicon Image in March 2015 and SiliconBlue in December 2011 we recorded identifiable intangible assets related to developed technology, customer relationships, licensed technology, patents, and in-process research. We monitor the carrying value of our acquired intangible assets for potential impairment and test the recoverability of such assets annually during the fourth quarter and whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. When we are required to determine the fair value of intangible assets other than goodwill, we use the income approach. We start with a forecast of all expected net cash flows associated with the asset and then apply a discount rate to arrive at fair value.

During our review of our strategic long-range plan completed at the end of the third quarter of fiscal 2018, we concluded that a certain product line had limited future revenue potential due to a decline in customer demand for that product. We determined that this conclusion constituted an impairment indicator to the related specific developed technology intangible asset acquired in our acquisition of Silicon Image. Our assessment of the fair value of this intangible asset concluded that it had been fully impaired as of September 29, 2018, and we recorded an impairment charge of $0.6 million in the Consolidated Statements of Operations.

In the second quarter of 2018, we made the strategic decision to discontinue our millimeter wave business, which included certain wireless technology intangible assets. We determined that this action constituted an impairment indicator related to certain of the developed technology intangible assets acquired in our acquisition of Silicon Image. Our assessment of the fair value of these intangible assets concluded that they had been fully impaired as of June 30,

2018, and we recorded an impairment charge of $11.9 million in the Consolidated Statements of Operations.

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In the third quarter of fiscal 2017, we updated our annual strategic long-range plan, which resulted in revised forecasts. We also sold 100% of the equity of our Hyderabad, India subsidiary and certain assets related to our Simplay Labs testing and certification business to an unrelated third party. We determined that these activities constituted impairment indicators related to certain of the developed technology intangible assets acquired in our acquisition of Silicon Image. Our assessment of the fair value of these intangible assets concluded that they had been impaired as of September 30, 2017, and we recorded a preliminary impairment charge of $36.2 million in the Consolidated Statements of Operations. During the fourth quarter of fiscal 2017, we completed our detailed analysis and evaluation of the information and assumptions used in the determination of the impairment charge, which included reviewing information, inputs, assumptions, and valuation methodologies used to estimate the fair value of these intangible assets, and finalization of review by an independent valuation expert. As a result, we recorded a $3.8 million reduction to the preliminary impairment charge recorded in the third quarter of fiscal 2017, for a net impairment charge of $32.4 million in fiscal 2017.

In September 2016, the Founders of the HDMI consortium, of which we are a member, amended the existing Founders Agreement as part of a regular amendment process resulting in changes to our role as agent for the HDMI consortium and to the model for sharing adopter fee revenues. Under the terms of the amended agreement, our role as the agent was terminated effective January 1, 2017 and a new independent entity was appointed to act as the new HDMI licensing agent with responsibility for licensing and the distribution of royalties among Founders. As a result of the amended model for sharing revenue, we were entitled to a reduced share of adopter fees paid by parties adopting the HDMI standard. We determined that this modification constituted an impairment indicator related to the intangible assets acquired in the Silicon Image acquisition associated with future HDMI adopter fees. Our assessment of the fair value of these intangible assets concluded that they had been impaired as of the end of the third quarter of fiscal 2016, and we recorded a $7.9 million impairment charge in the Consolidated Statements of Operations.

Note 11 - Cost Method Investment and Collaborative Arrangement

During fiscal 2015, we purchased a series of preferred stock ownership interests in a privately-held company that designs human-computer interaction technology for total consideration of $5.0 million. This gross investment constituted a 22.7% ownership interest. In the third quarter of fiscal 2016, we made an additional investment of $1.0 million via a convertible debt instrument, bringing our gross investment in the investee to $6.0 million at that time.

In each of the second and third quarters of fiscal 2017, we advanced the investee $1.0 million through a short-term instrument, bringing our total short-term advances to the investee to $2.0 million. As these advances were due and payable in the fourth quarter of fiscal 2017, they were included in Prepaid expenses and other current assets in our Consolidated Balance Sheets while outstanding. The investee repaid the total advances in October 2017.

In 2017, we signed new development and licensing contracts with the investee, and the investee obtained preferred debt that effectively subordinated our ownership position between their debt and common shareholders. After evaluating these events and our investment position, we concluded that we had a variable interest in the privately-held company. However, we were not the primary beneficiary of the investee, were not holding in-substance common stock, and did not have a significant amount of influence to direct the activities that most significantly impact the investee’s economic performance. Accordingly we accounted for our investment in this company under the cost method.

In the fourth quarter of fiscal 2018, we restructured our relationship such that we now own only preferred shares and the prior agreements were canceled, thereby eliminating the variable interest in the investee. See the “Collaborative Arrangement” section of this note for discussion of changes under the restructured relationship. We continue to account for our preferred shares investment in this company under the cost method.

We assess this investment for impairment on a quarterly basis by applying a fair value analysis using a revenue multiple approach. During fiscal 2018, we recognized an impairment adjustment, but our assessment as of December 29, 2018 concluded that no further impairment adjustment was necessary as of that date. The following table summarizes the impairment adjustments against this investment that we have recognized through Other (expense) income, net in the Consolidated Statements of Operations during the fiscal years presented:

(In thousands)	Year Ended		
	December 29, 2018	December 30, 2017	December 31, 2016
Impairment of cost-basis investment	$(266)	$ (1,761)	$ (1,459)

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Through December 29, 2018, we have reduced the value of our investment by approximately $4.0 million. The net balance of our investment included in Other long-term assets in the Consolidated Balance Sheets is detailed in the following table:

(In thousands)	Total
Balance at December 31, 2016	$4,049
Impairment of cost-basis investment	(1,761)
Balance at December 30, 2017	2,288
Impairment of cost-basis investment	(266)
Balance at December 29, 2018	$2,022

Collaborative Arrangement

During the fourth quarter of fiscal 2018, we restructured our relationship with the investee discussed above, including the cancellation of prior arrangements from the 2017 agreements that had provided for: (i) the assignment of certain Intellectual Property ("IP") from the investee to us, (ii) a license of certain IP from the investee to us, (iii) payment of royalties between the parties for future sales of co-developed products, (iv) the performance of certain services for each other at no additional charge. Under the 2017 agreements, we had agreed to make quarterly minimum payments to the investee, which were to be automatically credited against any future revenue share amount owed to the investee under the agreements, and which were accounted for as prepaid royalties under ASC 340. As of the fourth quarter 2018, and under the new contractual arrangement, we have returned the assignment of IP to the investee, we are no longer obligated to make quarterly royalty payments to the investee, and we have recorded Restructuring charges of $3.3 million in the Consolidated Statements of Operations for our abandonment of the accumulated balance of royalties prepaid under the 2017 agreements.

Note 12 - Accounts Payable and Accrued Expenses

Included in Accounts payable and accrued expenses in the Consolidated Balance Sheets are the following balances:

(In thousands)	December 29, 2018	December 30, 2017
Trade accounts payable	$ 31,880	$ 35,350
Liability for non-cancelable contracts	6,078	7,232
Restructuring	4,220	2,088
Other accrued expenses	9,585	9,735
Total accounts payable and accrued expenses	$ 51,763	$ 54,405

Note 13 - Lease Obligations

Certain of our facilities are leased under operating leases, which expire at various times through 2026. Rental expense under operating leases was $8.3 million, $8.9 million and $9.5 million for fiscal years 2018, 2017 and 2016, respectively. Future minimum lease commitments at December 29, 2018 are as follows:

Fiscal year (In thousands)	Amount
2019	$7,090
2020	6,893
2021	5,452
2022	4,658
2023	4,229
Thereafter	9,930

$38,252

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Note 14 - Income Taxes

The domestic and foreign components of loss before income taxes were as follows:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Domestic	$(8,274)	$ (17,341)	$ (33,962)
Foreign	(15,695)	(52,372)	(10,220)
Loss before taxes	$(23,969)	$ (69,713)	$ (44,182)

The components of the income tax expense are as follows:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Current:			
Federal	$536	$ 508	$ 1,896
State	38	30	13
Foreign	1,869	304	7,918
	2,443	842	9,827
Deferred:			
Federal	—	—	—
State	—	—	—
Foreign	(90)	7	90
	(90)	7	90
Income tax expense	$2,353	$ 849	$ 9,917

Income tax expense differs from the amount of income tax determined by applying the applicable U.S. statutory federal income tax rate to pretax income as a result of the following differences:

	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
	%	%	%
Statutory federal rate	(21)	(35)	(35)
Adjustments for tax effects of:			
State taxes, net	(6)	(7)	7
Research and development credits	(5)	(1)	(2)
Stock compensation	8	3	3
Foreign rate differential	20	28	15
Foreign dividends	—	1	—
Foreign withholding taxes	5	—	9
Other permanent	2	—	3
Other deferred tax asset adjustment	13	—	—
Valuation allowance	(11)	(73)	17
Change in uncertain tax benefit accrual	2	1	5
Stock compensation (ASU 2016-09) adoption	—	(8)	—
Tax rate change	—	93	—
Other	3	(1)	1
Effective income tax rate	10	1	23

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ASC 740, “Income Taxes”, provides for the recognition of deferred tax assets if realization of these assets is more-likely-than-not. We evaluate both positive and negative evidence to determine if some or all of our deferred tax assets should be recognized on a quarterly basis.

Through December 29, 2018, we continued to evaluate the valuation allowance position in the United States and concluded we should maintain a valuation allowance against the net federal and state deferred tax assets. In making this evaluation, we exercised significant judgment and considered estimates about our ability to generate revenue and gross profits sufficient enough to offset expenditures in future periods within the United States.

We will continue to evaluate both positive and negative evidence in future periods to determine if we should recognize more deferred tax assets. We don't have a valuation allowance in any foreign jurisdictions as we have concluded it is more likely than not that we will realize the net deferred tax assets in future periods. The net decrease in the total valuation allowance affecting the effective tax rate for the year ended December 29, 2018 was approximately $2.6 million, mainly attributable to the write down of intangible assets which had no tax basis.

The components of our net deferred tax assets are as follows:

(In thousands)	December 29, 2018	December 30, 2017
Deferred tax assets:		
Accrued expenses and reserves	$ 3,714	$ 3,096
Inventory	2	2
Deferred Revenue	—	228
Stock-based and deferred compensation	2,660	4,018
Interest expense disallowance	1,283	—
Intangible assets	14,649	19,576
Fixed assets	281	216
Net operating loss carry forwards	88,333	86,410
Tax credit carry forwards	92,208	90,530
Capital loss carry forwards	5,007	3,926
Other	1,130	2,323
Total deferred tax assets	209,267	210,325
Less: valuation allowance	(207,108)	(209,691)
Net deferred tax assets	2,159	634
Deferred tax liabilities:		
Fixed assets	1,536	559
Deferred revenue	525	—
Other	(57)	16
Total deferred tax liabilities	2,004	575
Net deferred tax assets	$ 155	$ 59

At December 29, 2018, we had U.S. federal net operating loss ("NOL") carryforwards (pretax) of approximately $365.3 million that expire at various dates between 2019 and 2037. We had state NOL carryforwards (pretax) of approximately $147.6 million that expire at various dates from 2019 through 2037. We also had federal and state credit carryforwards of $51.5 million and $61.2 million, respectively. Of the $61.2 million state credit carryforwards, $60.2 million do not expire. The federal and remaining state credits expire at various dates from 2019 through 2038.

Future utilization of federal and state net operating losses and tax credit carry forwards may be limited if cumulative changes to ownership exceed 50% within any three-year period. This has not occurred through fiscal 2018. If there is a significant change in ownership, future tax attribute utilization may be restricted (§382 limitation) and NOL

carryforwards and/or R&D credits will be reduced to reflect the limitation.

U.S. tax reform required a deemed repatriation of deferred foreign earnings as of December 30, 2017 and no future U.S. taxes should be due on these earnings because of enactment of a 100% dividends received deduction. We had no impact from this transition tax due to utilization of NOL carryforwards. Foreign earnings may be subject to withholding taxes in local jurisdictions if they are distributed and repatriated in the United States.

At December 29, 2018, our unrecognized tax benefits associated with uncertain tax positions were $44.0 million, of which $42.0 million, if recognized, would affect the effective tax rate, subject to valuation allowance. As of December 29, 2018, interest and penalties associated with unrecognized tax benefits were $8.6 million.

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Our liability for uncertain tax positions (including penalties and interest) was $26.3 million and $26.9 million at December 29, 2018 and December 30, 2017, respectively, and is recorded as a component of Other long-term liabilities on our Consolidated Balance Sheets. The remainder of our uncertain tax position exposure of $24.9 million is netted against deferred tax assets.

The following table summarizes the changes to unrecognized tax benefits for fiscal years 2018, 2017 and 2016:

(In thousands)	Amount
Balance at January 2, 2016	$48,207
Additions based on tax positions related to the current year	2,573
Additions based on tax positions of prior years	530
Reduction for tax positions of prior years	(1,824)
Reduction as a result of lapse of applicable statute of limitations	(1,863)
Balance at December 31, 2016	47,623
Additions based on tax positions related to the current year	471
Additions based on tax positions of prior years	11
Reductions for tax positions of prior years	(1,226)
Reduction as a result of lapse of applicable statute of limitations	(2,047)
Balance at December 30, 2017	44,832
Additions based on tax positions related to the current year	389
Additions based on tax positions of prior years	19
Reductions for tax positions of prior years	(5)
Reduction as a result of lapse of applicable statute of limitations	(1,235)
Balance at December 29, 2018	$44,000

At December 29, 2018, it is reasonably possible that $1.8 million of unrecognized tax benefits and $0.1 million of associated interest and penalties could be recognized during the next twelve months.

We are subject to federal and state income tax as well as income tax in the various foreign jurisdictions in which we operate. Additionally, the years that remain subject to examination are 2015 for federal income taxes, 2014 for state income taxes, and 2012 for foreign income taxes, including years ending thereafter. However, to the extent allowed by law, the tax authorities may have the right to examine prior periods where net operating losses or tax credits were generated and carried forward, and make adjustments up to the amount of the net operating losses or credit carryforward amount.

Our Philippines 2016 income tax return is currently under examination. We are not under examination in any other jurisdiction.

The Tax Cuts and Jobs Act (the "2017 Tax Act"), enacted December 22, 2017, contains provisions that affect us, but the impact will be absorbed by utilizing NOL carry forwards. Reduction of the corporate tax rate from 35% to 21% reduced the value of our domestic deferred tax assets and reduced our associated full valuation allowance on those assets, resulting in no net impact on our Consolidated Statements of Operation.

In March 2018, the FASB issued ASU 2018-05, Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118 ("SAB 118"). The SEC issued SAB 118 on December 22, 2017 to address the situation where an SEC reporting company did not have all the necessary information available or analyzed to complete their accounting for the income tax effects of the 2017 Tax Act in the period of enactment. Due to the lack of authoritative guidance issued, complexity, and enactment timing of the 2017 Tax Act, we made a reasonable estimate of the income tax effect of the deemed repatriation of deferred foreign earnings as part of the fiscal 2017 year-end tax provision. Changes to the provisional amount recorded at December 30, 2017 have been

finalized in the fourth quarter of fiscal 2018 with the filing of our 2017 tax return. There was no net impact on our Consolidated Statements of Operations, as we adjusted our NOL and valuation allowance.

We are not currently paying U.S. federal income taxes and do not expect to pay such taxes until we fully utilize our tax NOL and credit carryforwards. We expect to pay a nominal amount of state income tax. We are paying foreign income and withholding taxes, which are reflected in income tax expense in our Consolidated Statements of Operations and are primarily related to the cost of operating offshore activities and subsidiaries. We accrue interest and penalties related to uncertain tax positions in income tax expense.

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Note 15 - Restructuring

In December 2018, our management approved and executed an internal restructuring plan (the “December 2018 Plan”), which included a global workforce reduction. This plan also included the abandonment of long lived assets related to the restructuring of our agreements with a privately-held investee (see "Note 11 - Cost Method Investment and Collaborative Arrangement"). Approximately $4.8 million of restructuring expense has been incurred through December 29, 2018 under the December 2018 Plan, and we believe this amount approximates the total costs under the plan and that this plan is substantially complete.

In June 2018, our Board of Directors approved an internal restructuring plan (the "June 2018 Plan"), which included the discontinuation of our millimeter wave business and the use of certain assets related to our Wireless products, and a workforce reduction. The June 2018 Plan is designed to reduce our infrastructure costs and re-focus on our core business activities. Approximately $4.2 million of restructuring expense has been incurred through December 29, 2018 under the June 2018 Plan, and we believe this amount approximates the total costs under the plan and that this plan is substantially complete.

In June 2017, our Board of Directors approved an internal restructuring plan (the "June 2017 Plan"), which included the sale of 100% of the equity of our Hyderabad, India subsidiary and the transfer of certain assets related to our Simplay Labs testing and certification business, a worldwide workforce reduction, and an initiative to reduce our infrastructure costs, including reconfiguring our use of certain leased properties. Under this initiative approved by the Board in 2017, we vacated approximately 50% or our facility in San Jose, California in the fourth quarter of fiscal 2018, and recorded approximately $6.9 million of Restructuring charges from ceasing use of this space. These actions are part of an overall plan to achieve financial targets and to enhance our financial and competitive position by better aligning our revenue and operating expenses. Under this plan, approximately $8.4 million and $8.0 million of expense was incurred during the years ended December 29, 2018 and December 30, 2017, respectively. Approximately $16.4 million of total expense has been incurred through December 29, 2018 under the June 2017 Plan, and we expect the total cost to be approximately $21.5 million to $23.0 million.

In September 2015, we implemented a reduction of our worldwide workforce (the "September 2015 Reduction") separate from the March 2015 Plan. The September 2015 Reduction was designed to resize the company in line with the market environment and to better balance our workforce with the long-term strategic needs of our business. The September 2015 Reduction is substantially complete subject to certain remaining expected costs, which we do not expect to be material but which will be expensed as incurred. Under this reduction, no expense, approximately $0.7 million of credit, and approximately $2.0 million of expense was incurred during the years ended December 29, 2018, December 30, 2017, and December 31, 2016, respectively. Approximately $7.2 million of total expense has been incurred through December 29, 2018 under the September 2015 Reduction, and we believe this amount approximates the total costs expected.

In March 2015, our Board of Directors approved an internal restructuring plan (the "March 2015 Plan"), in connection with our acquisition of Silicon Image. The March 2015 Plan was designed to realize synergies from the acquisition by eliminating redundancies created as a result of combining the two companies. This included reductions in our worldwide workforce, consolidation of facilities, and cancellation of software contracts and engineering tools. The March 2015 Plan is substantially complete subject to certain remaining expected costs that we do not expect to be material and any changes in sublease assumptions should they occur, which will be expensed as incurred. Under this plan, no expense, approximately $0.1 million of credit, and approximately $7.3 million of expense was incurred during the years ended December 29, 2018, December 30, 2017, and December 31, 2016, respectively. Approximately $20.5 million of total expense has been incurred through December 29, 2018 under the March 2015 Plan, and we believe this amount approximates the total costs expected.

These expenses and credits were recorded to Restructuring charges on our Consolidated Statements of Operations. The restructuring accrual balance is presented in Accounts payable and accrued expenses (includes restructuring) and Other long-term liabilities on our Consolidated Balance Sheets.

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The following table displays the activity related to the restructuring plans described above:

(In thousands)	Severance & Related (1)	Lease Termination	Software Contracts & Engineering Tools (2)	Other See note (3) for 2018	Total
Balance at January 2, 2016	$ 3,696	$ 1,005	$ 377	$ —	$5,078
Restructuring charges	2,883	2,993	1,903	1,488	9,267
Costs paid or otherwise settled	(5,778)	(2,962)	(2,255)	(1,476)	(12,471)
Balance at December 31, 2016	$ 801	$ 1,036	$ 25	$ 12	$1,874
Restructuring charges	2,484	811	3,066	835	7,196
Costs paid or otherwise settled	(2,093)	(977)	(2,731)	(822)	(6,623)
Balance at December 30, 2017	$ 1,192	$ 870	$ 360	$ 25	$2,447
Restructuring charges	5,696	7,379	913	3,361	17,349
Costs paid or otherwise settled	(5,074)	381	(1,055)	(3,368)	(9,116)
Balance at December 29, 2018	$ 1,814	$ 8,630	$ 218	$ 18	$10,680

(1) Includes employee relocation costs and accelerated stock compensation

(2) Includes cancellation of contracts, asset impairments, and accelerated depreciation on certain enterprise resource planning and customer relationship management systems

(3) In fiscal 2018, "Other" activity includes the abandonment of long lived assets related to the restructuring of our agreements with a privately-held investee

Note 16 - Long-Term Debt

On March 10, 2015, we entered into a secured credit agreement (the "Credit Agreement") with Jefferies Finance, LLC and certain other lenders for purposes of funding, in part, our acquisition of Silicon Image. The Credit Agreement provided for a $350 million term loan (the "Term Loan") maturing on March 10, 2021 (the "Term Loan Maturity Date"). We received $346.5 million net of an original issue discount of $3.5 million and we paid debt issuance costs of $8.3 million. The Term Loan bears variable interest equal to the one-month LIBOR, subject to a 1.00% floor, plus a spread of 4.25%. The current effective interest rate on the Term Loan is 7.30%.

The Term Loan is payable through a combination of (i) quarterly installments of approximately $0.9 million, (ii) annual excess cash flow payments as defined in the Credit Agreement, which are due 95 days after the last day of our fiscal year, and (iii) any payments due upon certain issuances of additional indebtedness and certain asset dispositions, with any remaining outstanding principal amount due and payable on the Term Loan Maturity Date. The percentage of excess cash flow we are required to pay ranges from 0% to 75%, depending on our leverage and other factors as defined in the Credit Agreement. As of December 29, 2018, the Credit Agreement required a 75% excess cash flow payment.

In the first quarter of fiscal 2018, we made a required quarterly installment payment of $0.9 million. In the second quarter of fiscal 2018, we made a required excess cash flow payment of $0.2 million, a required quarterly installment payment of $0.9 million, and an additional $10.0 million principal payment. In the third quarter of fiscal 2018, we made a required quarterly installment payment of $0.9 million, and an additional $15.0 million principal payment. In the fourth quarter of fiscal 2018, we made a required quarterly installment payment of $0.9 million, and an additional $15.0 million principal payment. As of December 29, 2018, we had approximately $263.0 million outstanding under the Credit Agreement.

While the Credit Agreement does not contain financial covenants, it does contain informational covenants and certain restrictive covenants, including limitations on liens, mergers and consolidations, sales of assets, payment of dividends,

and indebtedness. We were in compliance with all such covenants in all material respects at December 29, 2018.

The original issue discount and the debt issuance costs have been accounted for as a reduction to the carrying value of the Term Loan on our Consolidated Balance Sheets and are being amortized to Interest expense in our Consolidated Statements of Operations over the contractual term, using the effective interest method.

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The fair value of the Term Loan approximates the carrying value, which is reflected in our Consolidated Balance Sheets as follows:

(in thousands)	December 29, 2018	December 30, 2017
Principal amount	$ 263,033	$ 306,791
Unamortized original issue discount and debt issuance costs	(3,386)	(5,616)
Less: Current portion of long-term debt	(8,290)	(1,508)
Long-term debt	$ 251,357	$ 299,667

Interest expense related to the Term Loan was included in Interest expense on the Consolidated Statements of Operations as follows:

	Year Ended		
(in thousands)	December 29, 2018	December 30, 2017	December 31, 2016
Contractual interest	$ 18,600	$ 16,503	$ 18,518
Amortization of debt issuance costs and discount	2,230	1,982	1,350
Total Interest expense related to the Term Loan	$ 20,830	$ 18,485	$ 19,868

As of December 29, 2018, expected future principal payments on the Term Loan were as follows:

Fiscal year	(in thousands)
2019	10,031
2020	63,131
2021	189,871
	$ 263,033

Note 17 - Stock-Based Compensation Plans

Employee and Director Stock Options, Restricted Stock and ESPP

We have four equity incentive plans (the "1996 Stock Incentive Plan," the "2001 Stock Plan," the "2013 Incentive Plan, and the "2011 Non-Employee Director Equity Incentive Plan") and in connection with our acquisition of Silicon Image in 2015, we assumed outstanding awards under the Silicon Image, Inc. 2008 Equity Incentive Plan and the Silicon Image, Inc. 1999 Equity Incentive Plan (together, the “Silicon Image Equity Incentive Plans”). Awards granted under the 1996 Stock Incentive Plan remain outstanding, but no awards granted under the 2001 Stock Plan remain outstanding, and no shares are available for future awards under these plans. Shares remain available for grants to employees and non-employee directors only under the 2013 Incentive Plan and the 2011 Non-Employee Director Equity Incentive Plan, respectively. In addition, we have made grants of inducement awards to certain of our newly hired executives and employees that are granted outside of, but governed by, the 2013 Incentive Plan. "Incentive stock options" under Section 422 of the U.S. Internal Revenue Code and restricted stock unit ("RSU") grants are part of our equity compensation practices for employees who receive equity grants. Options and RSUs generally vest quarterly over a four-year period beginning on the grant date. The contractual terms of options granted do not exceed ten years.

In May 2012, the Company's stockholders approved the 2012 Employee Stock Purchase Plan ("2012 ESPP"), which authorizes the issuance of 3.0 million shares of common stock to eligible employees to purchase shares of common stock through payroll deductions, which cannot exceed 10% of an employee's compensation. The purchase price of the shares is the lower of 85% of the fair market value of the stock at the beginning of each six-month offering period or 85% of the fair market value at the end of such period. We have treated the 2012 ESPP as a compensatory plan. We

recorded $0.6 million related compensation expense in both fiscal 2018 and 2016. During fiscal 2017 only, the ESPP was suspended and we recorded no related compensation expense.

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At December 29, 2018, a total of 6.1 million shares of our common stock were available for future grants under the 2013 Incentive Plan, and the 2011 Non-Employee Director Equity Incentive Plan. Following our 2018 Shareholder meeting, a share ratio of 2.2:1 was applied to the 2013 Incentive Plan. This ratio takes two and two tenths shares out of the 2013 Plan for every one full value granted. During fiscal 2018, a total of 2.5 million shares were adjusted out of the 2013 Plan. Shares subject to stock option grants that expire or are canceled, without delivery of such shares, generally become available for re-issuance under equity incentive plans. At December 29, 2018, a total of 1.7 million shares of our common stock were available for future purchases under the 2012 ESPP. On March 10, 2015, in conjunction with the acquisition of Silicon Image, we assumed certain outstanding stock option and RSU grants of the Silicon Image Equity Incentive Plans. We assumed all stock option grants that were unvested or vested and out-of-the-money and all outstanding unvested RSU grants. The exchange ratio for the conversion was 1.09816 for all grants. The conversion ratio was determined by the weighted average closing price of Lattice common stock for the ten days prior to the acquisition date divided by the offer price of $7.30. The converted outstanding option grants totaled 2,087,605 shares and converted RSU grants totaled 2,025,255 shares as of March 10, 2015. As of December 29, 2018, 76,449 options and 2,223 RSU shares arising from this conversion remained outstanding.

Stock-Based Compensation

Total stock-based compensation expense included in our Consolidated Statements of Operations is presented in the following table:

(In thousands)	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Cost of products sold	$940	$ 795	$ 888
Research and development	4,357	5,245	7,928
Selling, general, and administrative	8,349	6,503	7,397
Total stock-based compensation	$13,646	$ 12,543	$ 16,213

The stock-based compensation expense included in Selling, general, and administrative expense for fiscal 2018 includes approximately $1.4 million of additional one-time expense for acceleration of stock compensation under the CEO separation agreement executed with our former CEO during the first quarter of fiscal 2018.

ASC 718, “Compensation-Stock Compensation (“ASC 718”),” requires that we recognize compensation expense for only the portion of employee and director options and ESPP rights that are expected to vest.

The fair values of each option award on the date of grant and of the shares expected to be issued under the employee stock purchase plan are estimated using the Black-Scholes valuation model and the assumptions noted in the following table. The expected term is based on historical vested option exercises and includes an estimate of the expected term for options that are fully vested and outstanding. The expected volatility of both stock options and ESPP shares is based on the daily historical volatility of our stock price, measured over the expected term of the option or the ESPP purchase period. The risk-free interest rate is based on the implied yield on a U.S. Treasury zero-coupon issue with a remaining term closest to the expected term of the option. The dividend yield reflects that we have not paid any cash dividends since inception and do not intend to pay any cash dividends in the foreseeable future.

The following table summarizes the assumptions used in the valuation of stock option and ESPP compensation:

	Year Ended December 29, 2018	December 30, 2017	December 31, 2016
Employee and Director Stock Options			
Expected volatility	39.87% to 41.11%	40.96% to 48.01%	44.2% to 50.8%
Risk-free interest rate	2.29% to 2.78%	1.99% to 2.09%	.94% to 2.06%

Expected term (years)	4.08 to 4.25	4.08 to 4.25	4.06 to 4.78
Employee Stock Purchase Plan *			
Weighted average expected volatility	36.4%	—%	57.9%
Weighted average risk-free interest rate	1.61%	—%	0.43%
Expected term	6 months	n/a	6 months

* ESPP suspended during fiscal 2017 only

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At December 29, 2018, there was $6.8 million of total unrecognized compensation cost related to unvested employee and director stock options, which is expected to be recognized over a weighted average period of 2.3 years. Our current practice is to issue new shares to satisfy option exercises. Compensation expense for all stock-based compensation awards is recognized using the straight-line method.

The following table summarizes our stock option activity and related information for the year ended December 29, 2018:

(Shares and aggregate intrinsic value in thousands)	Shares	Weighted average exercise price	Weighted average remaining contractual term (years)	Aggregate Intrinsic Value
Balance, December 30, 2017	12,939	$ 5.76		
Granted	843	7.61		
Exercised	(4,882)	5.79		
Forfeited or expired	(2,284)	5.87		
Balance, December 29, 2018	6,616	$ 5.94		
Vested and expected to vest at December 29, 2018	6,616	$ 5.94	4.26	$ 6,788
Exercisable, December 29, 2018	3,122	$ 5.70	2.82	$ 3,668

The aggregate intrinsic value in the table above represents the total pretax intrinsic value (the difference between the Company's closing stock price on the last trading day of the fiscal year and the exercise price, multiplied by the number of in-the-money options) that would have been received by the option holders had all option holders exercised their options on that day. This amount changes based on the fair market value of the Company's stock. Total intrinsic value of options exercised for fiscal 2018, 2017, and 2016 was $6.5 million, $2.2 million, and $3.3 million, respectively. The total fair value of options and RSUs vested and expensed in fiscal 2018, 2017, and 2016 was $13.0 million, $12.5 million, and $15.6 million, respectively.

The resultant grant date weighted-average fair values for stock options granted, calculated using the Black-Scholes option pricing model with the noted assumptions for stock options, were $2.73, $2.02 and $2.14 for fiscal years 2018, 2017 and 2016, respectively. The weighted average fair values for the ESPP, calculated using the Black-Scholes option pricing model with the noted assumptions for the ESPP, were $1.50 and $1.82 for fiscal years 2018 and 2016, respectively.

The following table summarizes our RSU activity for the year ended December 29, 2018:

(Shares in thousands)	Shares	Weighted average grant date fair value
Balance, December 30, 2017	2,766	$ 5.85
Granted	3,498	8.02
Vested	(1,124)	5.97
Forfeited or expired	(728)	5.90
Balance, December 29, 2018	4,412	$ 7.53

At December 29, 2018 there was $31.6 million of total unrecognized compensation cost related to unvested RSUs. Our current practice is to issue new shares when RSUs vest. Compensation expense for RSUs is recognized using the straight-line method over the related vesting period.

In fiscal years 2016 through 2018, we granted stock options and RSUs with either a market condition or a performance condition to certain executives. The market condition is a comparison of the Company's relative Total Shareholder Return ("TSR") when compared to the TSR of a component of companies of the PHLX Semiconductor Sector Index over a measurement period. TSR is a measure of stock price appreciation plus dividends paid, if any, in the performance period. We determined and fixed the fair value of the awards with a market condition on the date of grant using a lattice-based option-pricing model. The valuation of these awards incorporated a Monte-Carlo simulation, and considered the likelihood that we would achieve the market condition. The performance condition is based upon the Company’s generating specified “adjusted” EBITDA levels on a trailing four-quarter basis in any two consecutive trailing four-quarter periods. We valued the RSUs with a performance condition using the market price on the day of grant.

The options with a market condition granted in fiscal years 2016 and 2017 have a two year vesting period and vest between 0% and 200% of the target amount, based on the Company's relative TSR when compared to the TSR of a component of companies of the PHLX Semiconductor Sector Index over a two year period. Under the terms of the grants, executives will receive the target amount if the Company’s TSR relative to that of the Index achieves or exceeds the 50th percentile. Executives may receive 200% if the Company’s TSR exceeds the 75th percentile. No vesting occurs if the Company’s TSR does not exceed the 25th percentile.

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In September 2018, we granted inducement awards outside of, but subject to the terms and conditions of the 2013 Incentive Plan to our incoming President and Chief Executive Officer. These awards included restricted stock units that vest and become payable upon satisfaction of certain market and performance conditions. The market and performance conditions include TSR and Adjusted EBITDA targets, respectively. The TSR-based awards vest and become payable over a three-year period based on the Company's TSR relative to the PHLX Semiconductor Sector Index, with 100% of the units vesting at the 50th percentile and 250% of the units vesting at the 75th percentile achievement, zero vesting if relative TSR is below the 25th percentile, and vesting scaling linearly for achievement between the 25th and 75th percentile. The Adjusted EBITDA-based awards will vest and become payable based upon the Company's generating specified "adjusted" EBITDA levels on a trailing four quarter basis in any two consecutive trailing four-quarter periods.

In September 2018, we granted inducement awards outside of, but subject to the terms and conditions of the 2013 Incentive Plan to our incoming Corporate Vice President of Research and Development, and we granted awards from the 2013 Incentive Plan to certain executives including our incoming Corporate Vice President of Marketing and Strategy and our Corporate Vice President and General Counsel. These awards included restricted stock units that would vest and become payable upon achievement of a target TSR. The awards vest and become payable over a three-year period based on the Company's TSR relative to the PHLX Semiconductor Sector Index, with 100% of the units vesting at the 50th percentile and 200% of the units vesting at the 75th percentile achievement, zero vesting if relative TSR is below the 25th percentile, and vesting scaling linearly for achievement between the 25th and 75th percentile.

The following table summarizes the activity for our stock options and RSUs with a market or performance condition:

(Shares in thousands)	Unvested	Vested	Total
Balance, December 30, 2017	707	83	790
Granted	788	—	788
Vested	(31)	31	—
Exercised	—	(104)	(104)
Canceled	(555)	(10)	(565)
Balance, December 29, 2018	909	—	909

We incurred stock compensation expense related to these stock option and RSU awards with a market or performance condition of approximately $0.9 million, $0.5 million, and $0.8 million in fiscal years 2018, 2017, and 2016, respectively, which is recorded as a component of total stock-based compensation expense.

The following table summarizes the assumptions used in the valuation of stock options and RSUs with a market or performance condition:

	Year Ended		
	December 29, 2018	December 30, 2017	December 31, 2016
Executive stock options with a market condition			
Expected volatility	n/a	41%	46%
Risk-free interest rate	n/a	1.9%	1.1%
Expected term (years)	n/a	4.5	4.5
Executive RSUs with a market or performance condition			
Expected volatility	41.06% to 41.74%	n/a	n/a
Risk-free interest rate	2.71% to 2.87%	n/a	n/a
Expected term (years)	3.00 to 3.16	n/a	n/a

Note 18 - Employee Benefit Plans

Qualified Investment Plan

In 1990, we adopted a 401(k) plan, which provides participants with an opportunity to accumulate funds for retirement. The plan does not allow investments in the Company's common stock. The plan allows for the Company to make discretionary matching contributions in cash. We recorded matching contributions of approximately $0.6 million, $0.8 million, and $0.9 million in fiscal years 2018, 2017, and 2016, respectively.

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2018 Cash Incentive Plan

On January 8, 2018, upon the recommendation of the Compensation Committee, the Board of Directors of the Company approved the 2018 Cash Incentive Plan (the “2018 Cash Plan”). The chief executive officer, other executive officers, and other members of senior management, including vice presidents and director-level employees, together with all other employees of the Company not on the Company's sales incentive plan are eligible to participate in the 2018 Cash Plan. Under the 2018 Cash Plan, individual cash incentive payments for the eligible employees will be based both on Company financial performance, as measured by achievement of operating income (before incentive plan accruals) and revenue goals within specified ranges established by the Compensation Committee, and Company performance, as measured by the achievement of personal management objectives. The Compensation Committee determines the performance of the chief executive officer, the chief financial officer and other participants based on the achievement of the management objectives established by the Compensation Committee during the first fiscal quarter of 2018. There was $5.9 million of expense recorded under this plan in fiscal 2018.

2017 Cash Incentive Plan

On December 20, 2016, upon the recommendation of the Compensation Committee, the Board of Directors of the Company approved the 2017 Cash Incentive Plan (the “2017 Cash Plan”). The chief executive officer, other executive officers, and other members of senior management, including vice presidents and director-level employees, together with all other employees of the Company not on the Company's sales incentive plan are eligible to participate in the 2017 Cash Plan. Under the 2017 Cash Plan, individual cash incentive payments for the eligible employees will be based both on Company financial performance, as measured by achievement of operating income (before incentive plan accruals) and revenue goals within specified ranges established by the Compensation Committee, and Company performance, as measured by the achievement of personal management objectives. The Compensation Committee determines the performance of the chief executive officer, the chief financial officer and other participants based on the achievement of the management objectives established by the Compensation Committee during the first fiscal quarter of 2017. There was $7.2 million of expense recorded under this plan in fiscal 2017.

2016 Cash Incentive Plan

On December 21, 2015, upon the recommendation of the Compensation Committee, the Board of Directors of the Company approved the 2016 Cash Incentive Plan (the “2016 Cash Plan”). The chief executive officer, other executive officers, and other members of senior management, including vice presidents and director-level employees, together with all other employees of the Company not on the Company's sales incentive plan are eligible to participate in the 2016 Cash Plan. Under the 2016 Cash Plan, individual cash incentive payments for the eligible employees will be based both on Company financial performance, as measured by achievement of operating income (before incentive plan accruals) and revenue goals within specified ranges established by the Compensation Committee, and Company performance, as measured by the achievement of personal management objectives. The Compensation Committee determines the performance of the chief executive officer, the chief financial officer and other participants based on the achievement of the management objectives established by the Compensation Committee during the first fiscal quarter of 2016. There was $4.7 million of expense recorded under this plan in fiscal 2016.

Note 19 - Contingencies

Legal Matters

On or about December 19, 2018, Steven A.W. De Jaray, Perienne De Jaray and Darrell R. Oswald (collectively, the “Plaintiffs”) commenced an action against the Company and several unnamed defendants in the Multnomah County Circuit Court of the State of Oregon, in connection with the sale of certain products by the Company to defendants in

or around 2008. Plaintiffs allege that the Company violated the Lanham Act, engaged in negligence and fraud by failing to disclose to purchaser the export-controlled status of the subject parts. Plaintiffs seek damages of $138 million, treble damages, and other remedies. In January 2019, the Company removed the action to the United States District Court for the District of Oregon. At this stage of the proceedings, the Company does not have an estimate of the likelihood or the amount of any potential exposure to the Company; however, the Company believes that these claims are without merit and intends to vigorously defend the action. See “Litigation and unfavorable results of legal proceedings could adversely affect our financial condition and operating results” in “Risk Factors” in Item 1A of Part I of this Annual Report on Form 10-K.

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From time to time, we are exposed to certain asserted and unasserted potential claims. Periodically, we review the status of each significant matter and assess its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and a range of possible losses can be estimated, we then accrue a liability for the estimated loss. Legal proceedings are subject to uncertainties, and the outcomes are difficult to predict. Because of such uncertainties, accruals are based only on the best information available at the time. As additional information becomes available, we reassess the potential liability related to pending claims and litigation and may revise estimates.

Note 20 - Valuation and Qualifying Accounts

The following table displays the activity related to changes in our valuation and qualifying accounts:

(In thousands)	Balance at beginning of period	Charged (Credit) to costs and expenses	Charged (credit) to other accounts	Settlements & write-offs net of recoveries	Balance at end of period
Fiscal year ended December 29, 2018					
Valuation allowance for deferred tax assets	209,691	(2,583)	—	—	207,108
Allowance for doubtful accounts	9,371	1	73	(9,248)	197
Allowance for warranty expense	255	580	—	(482)	353
	$219,317	$(2,002)	$73	$(9,730)	$207,658
Fiscal year ended December 30, 2017					
Valuation allowance for deferred tax assets	$260,687	$(50,960)	$(36)	$—	$209,691
Allowance for doubtful accounts	9,299	3	38	31	9,371
Allowance for warranty expense	352	100	—	(197)	255
	$270,338	$(50,857)	$2	$(166)	$219,317
Fiscal year ended December 31, 2016					
Valuation allowance for deferred tax assets	$252,578	$7,450	$659	$—	$260,687
Allowance for doubtful accounts	621	7,362	2,284	(968)	9,299
Allowance for warranty expense	370	216	—	(234)	352
	$253,569	$15,028	$2,943	$(1,202)	$270,338

Note 21 - Segment and Geographic Information

Segment Information

As of December 29, 2018, we had one operating segment: the core Lattice business, which includes semiconductor devices, evaluation boards, development hardware, and related intellectual property licensing, services, and sales. Qterics, a discrete software-as-a-service business unit, was previously an immaterial operating segment in the Lattice legal entity structure prior to the sale of Qterics in April 2016.

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Geographic Information

Our revenue by major geographic area, based on ship-to location of the end customer, where available, and ship-to location of distributor otherwise, is presented in the following table:

(In thousands)	Year Ended December 29, 2018		December 30, 2017		December 31, 2016	
United States:	$38,585	10%	$48,315	13%	$51,752	12%
China*	202,983	51	193,590	50	186,865	44
Europe	45,546	11	44,547	12	59,835	14
Japan	44,033	11	42,286	11	49,080	12
Taiwan	16,124	4	14,846	4	31,322	7
Other Asia*	34,979	9	26,916	7	37,826	9
Other Americas	16,549	4	15,461	4	10,374	3
Total foreign revenue	360,214	90	337,646	87	375,302	88
Total revenue	$398,799	100%	$385,961	100%	$427,054	100%

* During 2017, we realigned our geographic categories to group Hong Kong with China rather than with Other Asia. Prior periods have been reclassified to match current period presentation.

Our Property and equipment, net by country at the end of each period was as follows:

(In thousands)	December 29, 2018	December 30, 2017	December 31, 2016
United States	$ 27,353	$ 30,338	$ 30,532
China	2,360	4,632	10,617
Philippines	3,319	3,883	4,928
Taiwan	949	958	2,310
Japan	324	313	637
Other	578	299	457
Total foreign property and equipment, net	7,530	10,085	18,949
Total property and equipment, net	$ 34,883	$ 40,423	$ 49,481

Note 22 - Quarterly Financial Data (Unaudited)

A summary of the Company's consolidated quarterly results of operations is as follows:

	2018				2017 *			
(In thousands, except per share data)	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1
Revenue	$95,977	$101,484	$102,715	$98,623	$95,266	$91,971	$94,137	$104,587
Gross margin	54,306	58,364	50,248	56,521	51,216	53,322	51,209	60,832
Restructuring charges	11,854	90	4,376	1,029	2,483	3,071	1,576	66
Net (loss) income	$(7,121)	$6,974	$(20,223)	$(5,952)	$(7,213)	$(43,052)	$(13,022)	$(7,275)
Net (loss) income per share - basic and diluted	$(0.05)	$0.05	$(0.16)	$(0.05)	$(0.06)	$(0.35)	$(0.11)	$(0.06)

* Results for 2017 are presented in accordance with ASC 605, which was in effect during that fiscal year.

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
Lattice Semiconductor Corporation:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Lattice Semiconductor Corporation and subsidiaries (the Company) as of December 29, 2018 and December 30, 2017, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the years in the three-year period ended December 29, 2018 and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 29, 2018 and December 30, 2017, and the results of its operations and its cash flows for each of the years in the three-year period ended December 29, 2018, in conformity with U.S. generally accepted accounting principles.

We also have 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 December 29, 2018, 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 February 26, 2019 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for revenue recognition in 2018, due to the adoption of ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606) and related amendments.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated 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 consolidated 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 consolidated 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 consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2007.

Portland, Oregon
February 26, 2019

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
Lattice Semiconductor Corporation:

Opinion on Internal Control Over Financial Reporting

We have audited Lattice Semiconductor Corporation and subsidiaries' (the Company) internal control over financial reporting as of December 29, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 29, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 29, 2018 and December 30, 2017, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the years in the three-year period ended December 29, 2018, and the related notes (collectively, the consolidated financial statements), and our report dated February 26, 2019 expressed an unqualified opinion on those consolidated 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 Report on Internal Control Over Financial Reporting. 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 of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included 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/ KPMG LLP

Portland, Oregon
February 26, 2019

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Item 9. Changes in and Disagreements with Accountants On Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

In connection with the filing of this Form 10-K, our management, including our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) as of December 29, 2018. These disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms. Our disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that we accumulate and communicate correct information to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls are effective as of December 29, 2018.

Management's Report on Internal Control Over Financial Reporting

The management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) or 15d-15(f) under the Securities Exchange Act of 1934. The Company's internal control over financial reporting is a process designed to provide reasonable assurance regarding reliability of financial reporting and the preparation and fair presentation of published financial statements for external purposes in accordance with generally accepted accounting principles.

Our internal control over financial reporting includes those policies and procedures that:

(i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. GAAP, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and

(iii) 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. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met, and 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.

Management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of the Company's internal control over financial reporting as of December 29, 2018. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control - Integrated Framework (2013). Based on this assessment, management concluded that, as of December 29, 2018, the Company's internal control over financial reporting was effective.

KPMG LLP, our independent registered public accounting firm, has audited the Company's internal control over financial reporting and has issued its opinion on the effectiveness of the Company's internal control over financial reporting, which appears on page 81 in this Annual Report on Form 10-K.

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Remediation of Previously Disclosed Material Weakness

In Item 9A of Part II of our Annual report on Form 10-K for the year ended December 30, 2017, we disclosed a material weakness in internal control over financial reporting as a result of not conducting an effective risk assessment over significant unusual transactions and, as a result, not designing and implementing control activities over the accounting for those significant unusual transactions.

During fiscal 2018, we implemented new policies and procedures to enhance our risk assessment process to effectively design and implement control activities, including:

- Timely reviews with the Controller and/or CFO regarding technical accounting conclusions to ensure an effective risk assessment is performed to identify and assess changes within the business and external environment that may impact financial reporting;
- Routine Disclosure Committee meetings to highlight and identify unique or non-recurring transactions or events, the accounting for these matters and the associated relevant risk assessments;
- Expansion of the Disclosure Committee membership to include representatives from the Executive Leadership Team; and
- Continued risk assessment reviews, as warranted, with the Audit Committee.

Management has determined, through testing of our internal controls and procedures, that the remediation actions discussed above were effectively designed and demonstrated effective operation for a sufficient period of time to enable us to conclude that the material weaknesses has been remediated as of December 29, 2018.

Changes in Internal Control over Financial Reporting

Other than the remediation of the previously disclosed material weakness as described above, there were no changes in our internal controls over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

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PART III

Certain information required by Part III is incorporated by reference from our definitive proxy statement (the “Proxy Statement”) for the 2019 Annual Meeting of Stockholders, pursuant to Regulation 14A of the Securities Exchange Act of 1934, as amended, which we will file not later than 120 days after the end of the fiscal year covered by this report. With the exception of the information expressly incorporated by reference from the Proxy Statement, the Proxy Statement is not to be deemed filed as a part of this report.

Item 10. Directors, Executive Officers and Corporate Governance

Information regarding our directors that is required by this item is incorporated by reference from the information contained under the captions “Proposal 1: Election of Directors” and “Corporate Governance and Other Matters--Board Meetings and Committees” in the Proxy Statement. Information regarding our executive officers that is required by this item is incorporated by reference from the information contained under the caption "Executive Compensation--The Executive Officers of the Company” in the Proxy Statement.

Information regarding Section 16(a) reporting compliance that is required by this item is incorporated by reference from the information contained under the caption “Section 16(a) Beneficial Ownership Reporting Compliance” in the Proxy Statement.

We have adopted a Code of Conduct that applies to all of our employees, including our principal executive officer, principal financial officer, principal accounting officer, and persons performing similar functions. The Code of Conduct is posted on our website at www.latticesemi.com. There were no changes to our Code of Conduct during fiscal 2018. Amendments to the Code of Conduct or any grant of a waiver from a provision of the Code of Conduct requiring disclosure under applicable SEC rules, if any, will be disclosed on our website at www.latticesemi.com.

Information about our Corporate Governance Policies, our “Director Code of Ethics” and written committee charters for our Audit Committee, Compensation Committee, and Nominating and Governance Committee are available free of charge on the Company's website at www.latticesemi.com and are available in print to any shareholder upon request.

Information regarding our Audit Committee that is required by this Item is incorporated by reference from the information concerning our Audit Committee contained under the caption “Corporate Governance and Other Matters--Board Meetings and Committees” in the Proxy Statement.

Item 11. Executive Compensation

The information contained under the captions “Executive Compensation,” "Director Compensation," “Compensation Committee Interlocks and Insider Participation,” and “Compensation Committee Report” in the Proxy Statement is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information contained under the captions “Security Ownership of Certain Beneficial Owners and Management” and "Equity Compensation Plan Information" in the Proxy Statement is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information contained under the captions entitled “Certain Relationships and Related Transactions” and “Corporate Governance and Other Matters--Director Independence” in the Proxy Statement is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information contained under the caption entitled “Proposal 5: Ratification of Appointment of Independent Registered Public Accounting Firm--Audit and Related Fees” in the Proxy Statement is incorporated herein by reference.

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PART IV

Item 15. Exhibits

(a) List of Documents Filed as Part of this Report

(1) All financial statements

The following financial statements are filed as part of this report under Item 8.

Consolidated Financial Statements:	Page
Consolidated Balance Sheets	45
Consolidated Statements of Operations	46
Consolidated Statements of Comprehensive Loss	47
Consolidated Statements of Stockholders' Equity	48
Consolidated Statements of Cash Flows	49
Notes to Consolidated Financial Statements	51

All other schedules have been omitted because the required information is included in the Consolidated Financial Statements or the notes thereto, or is not applicable or required.

(2) Exhibits

Exhibit Number	Description
3.1	The Company’s Restated Certificate of Incorporation filed, as amended on June 4, 2009 (Incorporated by reference to Exhibit 3.1 filed with the Company's Current Report on Form 8-K filed June 4, 2009).
3.2	The Company’s Bylaws, as amended as of November 3, 2016 (Incorporated by reference to Exhibit 3.2 filed with the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2016).
10.1*	Lattice Semiconductor Corporation 1996 Stock Incentive Plan, as amended, and Related Form of Option Agreement (Incorporated by reference to Exhibit 10.24 filed with the Company's Annual Report on Form 10-K for the fiscal year ended December 29, 2012).
10.2*	2001 Stock Plan, as amended, and related Form of Option Agreement (Incorporated by reference to Exhibit 10.34 filed with the Company's Annual Report on Form 10-K for the fiscal year ended December 29, 2012).
10.3*	Form of Indemnification Agreement executed by each director and executive officer of the Company and certain other officers and employees of the Company and its subsidiaries (Incorporated by reference to Exhibit 10.41 filed with the Company’s Annual Report on Form 10-K for the fiscal year ended January 3, 2004).
10.4*	Form of Amendment to Stock Option Agreements for 1996 Stock Incentive Plan, as amended, and 2001 Stock Plan, as amended (Incorporated by reference to Exhibit 99.3 filed with the Company’s Current Report on Form 8-K filed on December 12, 2005).

10.5*	Form of Notice of Grant of Restricted Stock Units to Executive Officer (Incorporated by reference to Exhibit 99.1 filed with the Company's Current Report on Form 8-K filed on February 8, 2007).
10.6*	Employment Agreement between Lattice Semiconductor Corporation and Byron Milstead effective as of December 30, 2008 (Incorporated by reference to Exhibit 10.66 filed with the Company's Annual Report on Form 10-K filed for the fiscal year ended January 3, 2009).
10.7	Credit Agreement among Lattice Semiconductor Corporation, the Subsidiary Guarantors from time to time party thereto, the various Lenders from time to time party thereto, Jefferies Finance LLC as Administrative Agent, Jefferies Finance LLC and HSBC Securities (USA) Inc. as lead arrangers and book runners, Jefferies Finance LLC as syndication agent and HSBC Securities (USA) Inc. and ING Capital LLC as co-documentation agents (Incorporated by reference to Exhibit 10.1 filed with the Company's Current Report on Form 8-K filed March 11, 2015).

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Exhibit Number	Description
10.8*	Lattice Semiconductor Corporation 2012 Employee Stock Purchase Plan (incorporated by reference to Annex 1 to the Company's Definitive Proxy Statement on Schedule 14A for the 2012 Annual Meeting of Stockholders filed on April 12, 2012).
10.9*	Lattice Semiconductor Corporation Amended 2011 Non-Employee Director Equity Incentive Plan, as amended (Incorporated by reference to Annex B to the Company's Definitive Proxy Statement on Schedule 14A filed on filed on April 10, 2018).
10.10*	Lattice Semiconductor Corporation 2013 Incentive Plan, as amended (Incorporated by reference to Annex A to the Company's Definitive Proxy Statement on Schedule 14A filed on April 10, 2018).
10.11	Office Lease, effective as of October 21, 2014, between 555 SW Oak, LLC and Lattice Semiconductor Corporation (Incorporated by reference to Exhibit 10.1 filed with the Company’s Current Report on Form 8-K filed October 27, 2014).
10.12*	Lattice Semiconductor Corporation 2017 Cash Incentive Plan (Incorporated by reference to Exhibit 10.12 filed with the Company's Annual Report on Form 10-K filed on March 14, 2018).
10.13*	Lattice Semiconductor Corporation 2018 Cash Incentive Plan
10.14*	Separation Agreement, dated as of March 12, 2018, between Lattice Semiconductor Corporation and Darin G. Billerbeck (Incorporated by reference to Exhibit 10.1 filed with the Company’s Current Report on Form 8-K filed on March 12, 2018).
10.15	Letter Agreement, dated as of March 7, 2018, among Lattice Semiconductor Corporation, Lion Point Capital, LP, Lion Point Master, LP, Lion Point Capital GP, LLC, Lion Point Holdings GP, LLC, Didric Cederholm and Jim Freeman (Incorporated by reference to Exhibit 10.1 filed with the Company’s Current Report on Form 8-K filed on March 13, 2018).
10.16*	Employment Agreement, by and between Lattice Semiconductor Corporation and James R. Anderson, effective September 4, 2018 (Incorporated by reference to Exhibit 10.1 filed with the Company’s Current Report on Form 8-K filed on August 27, 2018).
10.17*	Employment Agreement, by and between Lattice Semiconductor Corporation and Stephen Douglass, effective September 4, 2018 (Incorporated by reference to Exhibit 10.2 filed with the Company’s Quarterly Report on Form 10-Q filed on October 29, 2018).
10.18*	Employment Agreement, by and between Lattice Semiconductor Corporation and Sherri Luther, effective January 2, 2019 (Incorporated by reference to Exhibit 10.1 filed with the Company’s Current Report on Form 8-K filed on January 2, 2019).
10.19*	CFO Notice and Supplemental Separation Benefit Letter, by and between Lattice Semiconductor Corporation and Max Downing, dated September 28, 2018 (Incorporated by reference to Exhibit 10.3 filed with the Company’s Quarterly Report on Form 10-Q filed on October 29, 2018).
10.20*	

	Employment Agreement, by and between Lattice Semiconductor Corporation and Esam Elashmawi, dated September 24, 2018.
21.1	Subsidiaries of the Registrant.
23.1	Consent of Independent Registered Public Accounting Firm.
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended.
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended.
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

* Management contract or compensatory plan or arrangement required to be filed as an Exhibit to this Annual Report on Form 10-K pursuant to Item 15(b) thereof.

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SIGNATURES

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

LATTICE SEMICONDUCTOR CORPORATION
(Registrant)

By:	/s/ Sherri Luther Sherri Luther Chief Financial Officer (Duly Authorized Officer and Principal Financial and Accounting Officer)
Date:	February 26, 2019

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints James Anderson and Sherri Luther, or either of them, his or her attorneys-in-fact, each with the power of substitution, for such person in any and all capacities, to sign any amendments to this report and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that either of said attorneys-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

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 in the capacities indicated and on the dates indicated:

Signature	Title	Date
Principal Executive Officer		
/s/ James Anderson		February 26, 2019
James Anderson	President, Chief Executive Officer, and Director	
Principal Financial and Accounting Officer		
/s/ Sherri Luther		February 26, 2019
Sherri Luther	Chief Financial Officer	
Directors		
/s/ Robin Abrams		February 26, 2019
Robin Abrams	Director	
/s/ Brian Beattie		February 26, 2019
Brian Beattie	Director	
/s/ John Bourgoin		February 26, 2019
John Bourgoin	Director	
/s/ Mark Jensen		February 26, 2019
Mark Jensen	Director	
/s/ James Lederer		February 26, 2019
James Lederer	Director	
/s/ John Major		February 26, 2019
John Major	Director	
/s/ Krishna Rangasayee		February 26, 2019
Krishna Rangasayee	Director	
/s/ Jeff Richardson		February 26, 2019
Jeff Richardson	Director	

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