LATTICE SEMICONDUCTOR CORP
Form 10-K
March 02, 2016
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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)

[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE FISCAL YEAR ENDED JANUARY 2, 2016

or

o 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)
111 SW Fifth Ave, Ste 700, Portland, OR	97204
(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 o No [X]

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 o No [X]

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 [X] No o

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

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. [X]

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

Large accelerated filer [X]	Accelerated filer o
Non-accelerated filer o	Smaller reporting company o

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

Aggregate market value of voting stock held by non-affiliates of the registrant as of July 4, 2015	567,750,755
Number of shares of common stock outstanding as of February 26, 2016	118,994,539

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 2016 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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Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements that involve estimates, assumptions, risks and uncertainties. Any statements about expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. Words or phrases such as “anticipates,” “believes,” “could,” “estimates,” “expects,” “intends,” “plans,” “predicts,” “projects,” “may,” “will,” “should,” “continue,” “ongoing,” “fu similar words or phrases identify forward-looking statements. Examples of forward-looking statements include, but are not limited to, statements about: our strategies and beliefs regarding the markets we serve or may serve; growth opportunities and growth in markets we may serve; acceptance of our devices; the advantages our products provide to our customers including faster time to market; our competitive advantage over our competitors; plans to introduce new product families in high-growth market niches where we believe that we have sustainable and differentiated positions; the costs of making and developing various products; our intention to continually introduce new products and enhancements and reduce manufacturing costs; a significant portion of our revenue being through our sell-through distributors; the impact of our global tax structure and expectations regarding taxes and tax adjustments; our expectations that a significant portion of our revenue will continue to be dependent on the Consumer, Communications, and Industrial end markets; the impact of products, customers and downward pressure on pricing and effects on gross margin; the Asia Pacific market being the primary source of our revenue; the impact of new accounting pronouncements; our expectations regarding customer preferences and product use; our future product development and marketing plans; our ability to maintain or develop successful foundry relationships to produce new products; our expectations regarding seasonal and economic trends; our belief regarding revenue from mature products;
our expectations regarding defenses to claims against our intellectual property; our making significant future investments in research and development; our beliefs concerning the adequacy of our liquidity and facilities, and our ability to meet our operating and capital requirements and obligations.

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 following factors, among others, could cause actual results to differ materially from the forward-looking statements: global economic conditions and uncertainty, the concentration of our sales in the Consumer and Communications end markets, particularly as it relates to the concentration of our sales in the Asia Pacific region, market acceptance and demand for our new products, our ability to license our intellectual property; any disruption of our distribution channels, unexpected charges, delays or results relating to our restructuring plans, the effect of the downturn in the economy on capital markets and credit markets, the impact of competitive products and pricing, unanticipated taxation requirements, or positions of the U.S. Internal Revenue Service, unexpected impacts of accounting guidance. In addition, actual results are subject to other risks and uncertainties that relate more broadly to our business, including those more fully described in our filings with the SEC, 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 actual results could differ materially from those expressed in any forward-looking statements. 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, and licenses.

We enable our customers to quickly and easily develop 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 historic focus was on the 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 2015, we extended our capabilities beyond PLDs with the acquisition of Silicon Image, Inc. and its portfolio of standards-driven Video Connectivity application specific standard products (ASSPs), 60 GHz mmWave devices, and associated intellectual property (IP). We believe that video consumption will continue to grow strongly and our broader product portfolio will allow us to reach markets that we could not previously access. Video expertise combined with FPGA-based hardware acceleration and both wired and wireless ways to distribute data allow us to penetrate new markets.

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

Our Markets and Customers

We sell globally into three markets: Consumer, Communications, and Industrial.

In the Consumer Market you can find our solutions making consumer products smarter and thinner, including: smartphones, tablets and e-readers, wearables, accessories such as chargers and docks, Ultra High-Definition (UHD) TVs, Digital SLR cameras, drones, and other connected devices.

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

- Higher resolution video content on larger screen sizes with minimal delays.
- 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.
- Fast design cycles. Products must be quickly and easily differentiated.
- Smaller form factors. Products need to lay flatter on the wall or sit more easily in people's pockets.

Lattice solutions help solve these challenges with the following products and services (described in detail below):

- A full suite of standards-based HDMI and MHL Video Connectivity ASSPs which enable the immersive audio-visual experience that consumers demand.
- PLDs which bring multiple benefits to our customers. PLD'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 are among the lowest power 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.

- mmWave Devices such as our SiBEAM Snap and WirelessHD products. SiBEAM Snap is a wireless connection technology that can transfer a high definition movie to a mobile device in seconds while eliminating the connector port. WirelessHD products enable laptops, projectors, accessories, and other Consumer products to wirelessly communicate at very high speeds.
- Intellectual Property Licensing which enables customers who wish to develop a proprietary solution to use our proven technology.

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Our proprietary solutions help our customers get their products to market faster than typical development cycles. With re-programmability and flexibility our PLDs inherently allow our customers to have quicker product development. Our deep engagement with industry standards bodies gives us an intimate knowledge of that technology and the ability to get better products to market faster. Our mmWave technology is at the forefront of wireless connectivity innovation. These time-to-market advantages are critical given shorter product life cycles and higher competition in our customers' end markets.

In the Communications Market our solutions play key roles in HetNet small cell base stations, network backhaul, wired access aggregation, and other related applications.

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

- 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 smaller, there is a growing requirement for smaller form factors with lower costs.

We help customers solve these problems with the following products:

- PLDs optimized for Input-Output (IO) expansion, acceleration and hardware management. Our FPGAs consume very low power, which reduces operating costs. Their small form factor enables higher functional density in less space. Finally, our FPGAs are IO 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.
- mmWave transceivers feature high-integration, low power design, and internal / external antenna options. Our beam-steering technology makes point-to-point links lighter, cheaper, lower power and easier to install, enabling backhaul at "wireless fiber" data rates.

Examples of our products enabling intelligent automation in the Industrial Market (Industrial) 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 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.
- 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.

Our product portfolio helps solve these challenges with the following products and services:

- Our small-sized, low-power PLDs not only provide the IO expansion, 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.
- Performance-tested and regulatory-approved mmWave modules greatly reduce the complexity of adding high-performance wireless video capabilities to displays, without the wires that clutter a factory floor or medical suite.
- Automotive qualified MHL / HDMI Video Connectivity ASSPs allow consumers to stream UHD video from their mobile phones to their in-car entertainment system, delivering the ultimate connected car experience.

Our Products, Services, and Competition

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

Programmable Logic Devices (“PLDs”)

PLDs 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. Four product family lines anchor our PLD 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 market but also find significant use in the Industrial market.

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The MachXO families are known as “Bridging and Expansion FPGAs.” They are control oriented and offer the lowest cost per
- MachXO3L was chosen by the trade publication EDN as one of the “100 Hot Products of 2014.” [http://www.edn.com/electronics-products/other/4437466/EDN-Hot-100-products-of-2014--MCUs--Processors---Programmab
- MachXO families are widely used across our three primary target markets: Communications, Industrial, 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 most recent member of the iCE40 families, the iCE40 UltraLite, was named “Digital Semiconductor Product of the Year” by the 2015 Elektra European Electronics Industry Awards. [http://www.electronicsweekly.com/news/elektra-awards-2015-the-winners-2015-11/]
- Programmable Mixed Signal devices, such as our Platform Manger 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 PLDs with intellectual property cores, reference designs, development kits, and design software.

Competition for our PLDs is fragmented.
- While ASICs, ASSPs, and microcontrollers have historically dominated high-volume market segments through low cost and reduced power consumption, our PLDs have become small enough with sufficiently low power that we are now considered by customers in cases where they need the architectural benefits of PLDs, namely programmability with its accelerated time-to-market and the speed that comes from parallelism. If a customer’s design is not working as intended, the customer can quickly change it using the programmability of our PLDs 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 PLD competitors are Xilinx and Intel/Altera. Both make PLDs but 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 ASSPs

In the 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, MHL, 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) manufacturers 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, HD TVs, home theater systems, automotive infotainment, PCs, accessories, projectors, and monitors.

In general, our Video Connectivity competition includes:
- HDMI or MHL 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 a small number of companies.

While our competition mainly tries to win with price, we believe that we have an advantage because of our deep engagement with industry standards bodies. This involvement enables us to bring our “standards plus” products to market more quickly and gives our customers confidence that we have the expertise needed to successfully execute.

mmWave Devices

Our mmWave Devices and modules allow customers to wirelessly transfer data and UHD video content at gigabit speeds. Built using our proprietary 60 GHz SiBEAM technology, our mmWave transceivers, processors, and antenna arrays are divided into three groups, differentiated by their transmission range:

- Gigabit Connector devices “eliminate the connectors on your mobile products.” Built with SiBEAM Snap technology these devices under development connect consumer products and are effective across centimeter distances.

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- Our Gigabit Indoor devices and modules “cut the wires in home, office, and factory.” Geared around the Consumer and Industrial Markets these devices reach distances measured in meters.
- Gigabit Outdoor products provide “wireless fiber for network backhaul.” Achieving a range of 100’s of meters these devices provide the Communications market with ultra-high speed links for point-to-point connectivity.

Our competition includes a small number of established semiconductor companies that work to create an advantage by bundling mmWave technology into their reference designs and processors. We believe that the depth of our 60 GHz experience enables us to get products to market faster and when combined with advanced features, such as our advanced beam-forming technology, gives us an edge over our competition.

Intellectual Property (IP) Licensing

Lattice has a broad set of technological capabilities and many US and international patents. We generate revenue from our technology portfolio via upfront fees and on-going royalty payments with three sets of activities:

1. 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 consortia members, including us.
2. 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 sell 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.
3. 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.

Simplay Labs, LLC (“Simplay Labs”)

Simplay Labs develops performance standards, testing services, development tools, and technologies for Consumer product manufacturers. By partnering with Simplay Labs, manufacturers can reduce the time and cost to market, providing products that are distinguished by reliability and ease of operation while delivering the high-performance HD their customers demand. The products that Simplay Labs tests include televisions, A/V receivers, sound bars, set-top boxes, gaming consoles, and media hubs. Simplay Labs has service centers operating in the United States, South Korea, China, and Taiwan. Simplay’s service centers provide compliance, interoperability and performance testing.

Research and Development

We place a substantial emphasis on new product development, with a priority on return on investment, 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 and Sunnyvale, California; Shanghai, China; Alabang, Philippines; and Hyderabad, India.

Research and development expenses were $136.9 million in 2015, $88.1 million in 2014, and $81.0 million in 2013. The increase in fiscal 2015 as compared to fiscal 2014 is substantially due to the inclusion of approximately ten months of activity from Silicon Image following acquisition. We expect to continue to make significant investments in research and development.

Operations

We do not manufacture our own silicon products. We maintain strategic relationships with large 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 also able to take advantage of the ongoing advanced process technology development efforts of semiconductor foundries.

Lattice and Fujitsu Limited ("Fujitsu") have entered into agreements pursuant to which Fujitsu manufactures our products on its 130nm, 90nm and 65nm CMOS process technologies, as well as on 130nm, 90nm and 65nm technologies with embedded flash memory that we have jointly developed with Fujitsu. Taiwan Semiconductor Manufacturing Company Ltd. (“TSMC”) manufactures our 40nm iCE and legacy Silicon Image products. United Microelectronics Corporation ("UMC") manufactures certain of our 40nm products, as well as some of our 350nm and 180nm products. Seiko Epson ("Epson") manufactures some of our 500nm, 350nm, 250nm and 180nm products.

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All of our assembly and volume test operations are performed by outside suppliers.

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.

We perform certain test operations as well as reliability and quality assurance processes internally. We have achieved and maintained ISO9001:2008 Quality Management Systems Certification and released a line of products qualified to the AEC-Q100 Reliability Standard.

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.

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 assembly partners in Indonesia, Malaysia, Taiwan, the Philippines, South Korea, Singapore, Japan, and the United States. 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

We electrically sort test the die on most wafers prior to shipment for assembly. Following assembly, but prior to customer shipment, each product undergoes final testing and quality assurance procedures. Wafer sort testing is performed by independent contractors in Malaysia, Japan, Indonesia, Taiwan, and Singapore. Final testing is performed by independent contractors in Indonesia, Malaysia, the Philippines, Singapore, Taiwan, South Korea, Japan, and the United States. We also perform certain test operations, as well as reliability and quality assurance processes, internally.

Sales and Revenue

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

- Product and Technology Sales involve direct and channel sales of silicon based products with their associated solutions and services.
- Intellectual Property Licensing involves either the license or sale of intellectual property that we have developed, some of which is used in our products.

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 which are for deliveries within the next year. Historically, our backlog is a poor 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 sell-through 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.

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A growing 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 sell-in (primarily Japan) and sell-through 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, Consumer and Industrial end markets.

We have agreements with 20 manufacturers' representatives in North America. We have established sales channels in over 50 foreign countries and maintain a network of 10 international sales representatives. A substantial portion of our sales are made through distributors.

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 sell-through distributors accounted for approximately 45% of our net revenue in each of fiscal 2015, 2014, and 2013, and 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 sell-through distributors. We also have regional distribution in Asia, Japan, Israel, and North America, and we sell through three major on-line distributors.

In fiscal 2015, our revenue was broadly distributed across end markets and customers, with no individual end customer accounting for more than 10% of the total revenue for the year. In fiscal 2014, Huawei Technologies Co. Ltd. accounted for 12% of total revenue while Samsung Electronics Co., Ltd. accounted for 19% of total revenue that same year, down from 22% in fiscal 2013. No other individual end customers, in any end markets, accounted for more than 10% of total revenue in either of the fiscal years 2014 or 2013.

Revenue from foreign sales as a percentage of total revenue was 92%, 92%, and 91%, for fiscal 2015, 2014, and 2013, respectively. We assign revenue to geographies based on customer ship-to address at the point where revenue is recognized. Revenue attributed to China for fiscal 2015 was approximately 36% of total revenue, compared to 43% and 45% in fiscal 2014 and fiscal 2013, respectively. In the case of sell-in distributors and OEMs, revenue is typically recognized, and geography is assigned, when products are shipped. In the case of sell-through distributors, revenue is recognized when resale to the end customer occurs and geography is assigned based on the end customer location on the resale reports provided by the distributor. Both foreign and domestic sales are denominated in U.S. dollars, with the exception of sales in Japan, where sales to certain customers are denominated in yen.

The composition of our revenue by geography, based on ship-to location, is as follows:

	Year Ended									% Change in	
(In thousands)	January 2, 2016			January 3, 2015			December 28, 2013			2015	2014
Asia	$308,534	76	%	$266,831	73	%	$245,689	74	%	16	9
Europe	55,596	14		59,041	16		47,459	14		(6)	24
Americas	41,836	10		40,255	11		39,377	12		4	2
Total revenue	$405,966	100	%	$366,127	100	%	$332,525	100	%	11	10

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.

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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 2016 and 2034, 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 January 2, 2016, we had 1,146 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. Our headquarters is located at 111 SW Fifth Avenue, Suite 700, Portland, Oregon 97204, and 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.

Reporting Calendar

We report based on a 52 or 53-week fiscal year ending on the Saturday closest to December 31. Our fiscal 2015 was a 52-week year that ended January 2, 2016. Our fiscal 2014 was a 53-week year, with a 14-week fourth quarter, that ended January 3, 2015. Our fiscal 2013, 2012, and 2011 were 52-week years that ended December 28, 2013, December 29, 2012, December 31, 2011, respectively. Our fiscal 2016 will be a 52-week year and will end on December 31, 2016. 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 111 SW Fifth Ave, Ste. 700, Portland, Oregon 97204, telephone (503) 268-8000. Our SEC filings are also available at the SEC's website at www.sec.gov, and they may be read and copied at the SEC's public reference room at 100 F Street NE, Washington, DC 20549. Information on the operation of the Public Reference Room can be obtained by calling the SEC at 1-800-SEC-0330. 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 limited number of independent suppliers for the manufacture of all of our products and a failure by our suppliers to provide timely, cost-effective, and quality products could adversely affect our operations and financial results.

We depend on independent foundries to supply silicon wafers for our products. These foundries include Fujitsu in Japan, which supplies the majority of our programmable logic wafers, and Taiwan Semiconductor Manufacturing, which supplies most of our HDMI and MHL integrated circuits. We negotiate wafer volumes, prices, and other terms with our foundry partners and their respective affiliates on a periodic basis typically resulting in short-term agreements which do not ensure long-term supply or allocation commitments. We rely on our foundry partners to produce wafers with competitive performance attributes. If the foundries that supply our wafers experience manufacturing problems, including unacceptable yields, delays in the realization of the requisite process technologies, or difficulties due to limitations of new and existing process technologies, our operating results could be adversely affected. If for any reason the foundries are unable to, or do not, manufacture sufficient quantities of our products or continue to manufacture a product for the full life of the product, we may be required to prematurely limit or discontinue the sales of certain products or incur significant costs to transfer products to other foundries, and our customer relationships and operating results could be adversely affected. In addition, weak economic conditions may adversely impact the financial health and viability of the foundries and cause them to limit or discontinue their business operations, resulting in shortages of supply and an inability to meet their commitments to us, which could adversely affect our financial condition and operating results.

A disruption of our foundry partners' operations as a result of a fire, earthquake, act of terrorism, political or labor unrest, governmental uncertainty, war, disease, or other natural disaster or catastrophic event, or any other reason, could disrupt our wafer supply and could adversely affect our operating results.

Establishing, maintaining and managing multiple foundry relationships requires the investment of management resources as well as additional costs. If we fail to maintain our foundry relationships, or elect or are required to change foundries, we will incur significant costs and manufacturing delays. The success of certain of our next generation products is dependent upon our ability to successfully partner with Fujitsu, Taiwan Semiconductor and other foundry partners. If for any reason one or more of our foundry partners does not provide its facilities and support for our development efforts, we may be unable to effectively develop new products in a timely manner.

Should a change in foundry relationships be required, we may be unsuccessful in establishing new foundry relationships for our current or next generation products, or we may incur substantial cost and or manufacturing delays until we form and ramp relationships, and migrate products, each of which could adversely affect our operating results.

The Consumer end market is rapidly changing and cyclical, and a downturn in this end market or our failure to accurately predict the frequency, duration, timing, and severity of these cycles could adversely affect our financial condition and results.

With the acquisition of Silicon Image, the Consumer end market has increased in importance to us. Revenue from the Consumer end market accounted for 31% of our revenue in fiscal 2015. Revenue from the Consumer end market consists primarily of revenue from our products designed and used in a broad range of consumer electronics products including smartphones, tablets and e-readers, wearables, accessories such as chargers and docks, Ultra High-Definition (UHD) TVs, Digital SLR cameras, drones, and other connected devices. This market is characterized by rapidly changing requirements and product features and volatility in consumer demand. Our success in this market will depend principally on our ability to:

- meet the market windows for consumer products;
- predict technology and market trends;
- develop IP cores to meet emerging market needs;
- develop products on a timely basis;
- maintain multiple design wins across different markets and customers to dampen the effects of market volatility;
- be designed into our customers' products; and
- avoid cancellations or delay of products.

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Our inability to accomplish any of the foregoing, or to offset the volatility of this end market through diversification into other markets, could materially and adversely affect our business, financial condition, and results of operations. Cyclicality in the Consumer end market could periodically result in higher or lower levels of revenue and revenue concentration with a single or small number of customers. In addition, rapid changes in this market may affect demand for our products, may cause our revenue derived from sales in this market to vary significantly over time, adversely affecting our financial results.

A downturn in the Communications end market could cause a meaningful reduction in demand for our products and limit our ability to maintain revenue levels and operating results.

Revenue from the Communications end market accounted for 28% of our revenue in fiscal 2015. Three of our top five programmable logic customers participate primarily in the Communications end market. In the past, cyclical weakening in demand for programmable logic products from customers in the Communications end market has adversely affected our revenue and operating results. In addition, telecommunication equipment providers are building network infrastructure for which we compete for product sales. Any deterioration in the Communications end market, our end customers' reduction in spending, or a reduction in spending by their customers to support this end market or use of our competitors’ products could lead to a reduction in demand for our products which could adversely affect our revenue and results of operations. This type of decline impacted our results during 2015.

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

A large portion of our revenue depends on sales to a limited number of customers. During fiscal 2015, our top two end customers, Samsung Electronics Co., Ltd. and Huawei Technologies Co. Ltd, accounted for 9% and 8%, respectively, of our total revenue as compared to fiscal 2014, which was prior to the acquisition of Silicon Image, during which these same top two customers accounted for 19% and 12%, respectively, of our total revenue. Additionally, during fiscal 2015, our top five end customers accounted for approximately 32% of our total revenue, which was down from fiscal 2014, during which our top five end customers accounted for approximately 45% of our total revenue. If any of these relationships were to diminish, or if these customers were to develop their own solutions, or adopt alternative solutions or competitors' solutions, our results could be adversely affected.

While we strive to maintain a strong relationship with our customers, their 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. For example, in December 2014, one of its largest customers informed Silicon Image that the customer had decided not to include Silicon Image’s MHL functionality in certain designs in order to reduce costs. Any significant loss of, or a significant reduction in purchases by, one or more of these customers, or their failure to meet their commitments to us, could have an adverse effect on our financial condition and results of operations. If any one or more of our concentrated group of customers were to experience significantly adverse financial conditions, our financial condition and business could be adversely affected as well, as occurred when Silicon Image’s fiscal 2014 mobile product revenue decreased as a result of a significant production slowdown by one of its key customers.

Acquisitions, strategic investments and strategic partnerships present risks, and we may not realize the goals that were contemplated at the time of a transaction.

On March 10, 2015, we acquired Silicon Image, and we may make further acquisitions and strategic investments in the future. Acquisitions and strategic investments, including our acquisition of Silicon Image, present risks, including:

- our ongoing business may be disrupted and our management's attention may be diverted by investment, acquisition, transition, or integration activities;
- an acquisition or strategic investment may not perform as well or further our business strategy as we expected, and we may not integrate an acquired company or technology as successfully as we expected;
- we may incur unexpected costs, claims, or liabilities that we assume from an acquired company or technology or that are otherwise related to an acquisition;
- we may discover adverse conditions post-acquisition that are not covered by representations and warranties;
- we may increase some of our risks, such as increasing customer or end product concentration;
- we may have difficulty incorporating acquired technologies or products with our existing product lines;
- we may have higher than anticipated costs in continuing support and development of acquired products, and in general and administrative functions that support such products;
- we may have difficulty integrating and retaining key personnel;
- we may have difficulty integrating business systems, processes, and tools, such as accounting software, inventory management systems, or revenue systems which may have an adverse effect on our business;
- our liquidity and/or capital structure may be adversely impacted;
- our strategic investments may not perform as expected;

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- we may experience unexpected changes in how we are required to account for our acquisitions and strategic investments pursuant to U.S. GAAP;
- we may have difficulty integrating acquired entities into our global tax structure with potentially negative impacts on our effective tax rate;
- if the acquisition or strategic investment does not perform as projected, we might take a charge to earnings due to impaired goodwill;
- we may divest certain assets of acquired businesses, leading to charges against earnings; and
- we may experience unexpected negative responses from vendors or customers to the acquisition, which may adversely impact our operations.

The occurrence of any of these risks could have a material adverse effect on our business, results of operations, financial condition, or cash flows, particularly in the case of a larger acquisition or several concurrent acquisitions or strategic investments. In addition, we may enter into strategic partnerships with third parties with the goal of gaining access to new and innovative products and technologies. Strategic partnerships pose many of the same risks as do acquisitions or investments.

We do not guarantee that we will be able to complete any future acquisitions or that we will realize any anticipated benefits from any of our past or future acquisitions, strategic investments, or strategic partnerships. We may not be able to find suitable acquisition opportunities that are available at attractive valuations, if at all. A sustained decline in the price of our common stock may make it more difficult and expensive to initiate or complete additional acquisitions on commercially acceptable terms.

As a result of current year and past acquisitions, as of January 2, 2016, we had $267.5 million in goodwill and $162.6 million in net intangible assets on our balance sheet, net of impairment charges recorded in fiscal 2015. 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 for impairment, the Company operates as two reporting units: the core Lattice ("Core") business, which includes intellectual property and semiconductor devices, and Qterics, a discrete software-as-a-service business unit in the Lattice legal entity structure. Although these two operating segments constitute two reportable segments, we combine Qterics with our Core business and report them together as one reportable segment due to the immaterial nature of the Qterics segment. Following our assessment of goodwill and long-lived asset impairment in the fourth quarter of 2015, we concluded that goodwill and long-lived assets had been impaired in the Qterics segment. As a result, we recorded impairment charges related to goodwill and intangible assets in the Qterics segment amounting to $12.7 million and $9.0 million, respectively, in the Consolidated Statements of Operations for the year ended January 2, 2016. No impairment charges were recorded for the Core segment in fiscal 2015, and we had no impairment charges in either fiscal 2014 or 2013. There is no assurance that future impairment tests will indicate that goodwill will be deemed recoverable.

We depend on distributors to generate a significant portion of our revenue and complete order fulfillment and any adverse change in our relationship or the distributors' financial health, reduction of selling efforts, or inaccuracy in resale reports could harm our sales or result in misreporting our results.

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. Resales of product through distributors accounted for 45% of our revenue in 2015, with two distributors accounting for 32% of our revenue in 2015. With the acquisition of Silicon Image, we expect that distributors will continue to generate a significant portion of our revenue.

We 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. In addition, a significant reduction of effort by a distributor to sell our products or a material change in our relationship with one or more distributors may reduce our access to certain end customers and adversely affect our ability to sell our products.

The financial health of our distributors is important to our success. Economic conditions may adversely impact the financial health of one or more of our distributors. This could result in the inability of distributors to finance the purchase of our products or cause the distributors to delay payment of their obligation to us and increase our credit risk. If the financial health of our distributors impairs their performance and we are unable to secure alternate distributors, our financial condition and results of operations may be negatively impacted.

Since we have limited ability to forecast inventory levels at our end customers, it is possible that there may be significant build-up of inventories in the distributor channel, with the OEM or the OEM’s contract manufacturer. Such a buildup could result in a slowdown in orders, requests for returns from customers, or requests to move out planned shipments. This could adversely affect our revenues and profits. Any failure to manage these challenges could disrupt or reduce sales of our products and unfavorably impact our financial results.

We depend on the timeliness and accuracy of resale reports from our distributors; late or inaccurate resale reports could have a detrimental effect on our ability to properly recognize revenue and our ability to predict future sales.

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

In connection with our acquisition of Silicon Image, we entered into a secured Credit Agreement providing for a $350 million term loan. Our obligations under the Credit Agreement are guaranteed by our U.S. subsidiaries. Our obligations include a requirement to pay up to 75% of our excess cash flow toward repayment of the facility. The Credit Agreement also contains certain 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 term loan. We might not have sufficient assets to repay such indebtedness upon a default. If we are unable to repay the indebtedness, the lenders could initiate a bankruptcy proceeding against us or collection proceedings with respect to our assets and subsidiaries securing the facility, which could materially decrease the value of our common stock.

Our success and future revenue depends on our ability to innovate, develop and introduce new products that achieve customer and market acceptance, and to successfully compete in the highly competitive semiconductor industry, and failure to do so could have a material adverse effect on our financial condition and results of operations.

The semiconductor industry is intensely competitive and many of our direct and indirect competitors have substantially greater financial, technological, manufacturing, marketing, and sales resources. 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.

The markets in which we compete are 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 addressing the evolving needs of the markets we serve. These new products typically are more technologically complex than their predecessors.

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;
- 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 MHL-enabled and wireless mobile products, and our 60 GHz wireless products;
- customer acceptance of advanced features in our new products; and
- market acceptance of our customers' products.

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Our product innovation and development efforts may not be successful; our new products, MHL-enabled products, and 60GHz wireless products may not achieve market or customer acceptance; and we may not achieve the necessary volume of production to achieve acceptable cost. Revenue relating to our mature products is expected to decline in the future, which is normal for our product life cycles. As a result, we may be increasingly dependent on revenue derived from our newer products as well as anticipated cost reductions in the manufacture of our current products. 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.

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. 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 weak economic conditions persist or worsen, 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, 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.

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

Our business strategy includes licensing our intellectual property to companies that incorporate it into their respective technologies, which address markets in which we do not directly participate or compete. We also license our intellectual property into markets where we do participate and compete. Our licensing and services revenue may be impacted by the introduction of new technologies by customers in place of the technologies based on our intellectual property, changes in the law that may weaken our ability to prevent the use of our patented technology by others, and changes of selling prices for products using licensed patents. We make no assurance 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, 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 depend upon many factors including completion of milestones, allocation of values to delivered items and customer acceptances. Many of these require significant judgments. Additionally, this is a new end market for us, with which we do not yet have extensive experience.

We have also generated revenue from the sale of certain patents from our portfolio, generally for 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 do not 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.

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. Generating revenue from 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 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.

A single large customer may be in a position to demand certain functionality, pricing or timing requirements that may detract from or interfere with our normal business activities. If this happens, delays in our normal development schedules could occur, causing our products to miss market windows thereby reducing the total number of units sold of a particular product.

The products we develop are complex and require significant planning and resources. In the Consumer end market, new products are typically introduced early in the year, often in association with key trade shows. In order to meet these deadlines, our customers must complete their product development by year-end, which usually means we must ship sample parts in early spring. If we cannot ship sample parts in early spring, customers may be forced to remove the feature provided by our product,

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use a competitor's product, or use an alternate technology in order to meet their timelines. We plan our product development with these market windows in mind, but if we receive requests from a large customer to deploy resources to meet their requirements or work on a specific solution, our normal development path could be delayed, causing us to miss sample deadlines and therefore future revenues.

A number of factors, including our inventory strategy, can impact our gross margins.

A number of factors, including yield, wafer pricing, cost of packaging raw materials, product mix, market acceptance of our new products, competitive pricing dynamics, geographic and/or end market mix, and pricing strategies, can cause our gross margins to fluctuate. In addition, forecasting our gross margins is difficult because a significant portion of our business is based on turns within the same quarter.

Our customers typically test and evaluate our products prior to deciding to design our product into their own products, and then require additional time to begin volume production of those products. This lengthy sales cycle may cause us to experience significant delays and to incur additional inventory costs until we generate revenue from our products. It is possible that we may never generate any revenue from products after incurring significant expenditures.

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. In addition, our inventory levels may be higher than historical norms, from time to time, due to inventory build decisions aimed at 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. In addition, future product cost reductions could impact our inventory valuation, which could adversely affect our operating results.

We and our connectivity customers depend on the availability of certain functions and capabilities within mobile and personal computing operating systems over which we may have no control. New releases of these operating systems may render certain of our products inoperable or may require significant engineering effort to create new device driver software.

Certain portions of our business operate within a market that is dominated by a few key OEMs. These OEMs could play a role in driving the growth of our business or could prevent our growth through deliberate or non-deliberate action. We do not have a presence in the iOS or Windows eco-systems or in all Android devices. Our success and ability to grow depend upon our ability to continue to be successful within the Android eco-system or gain significant traction within the iOS eco-system or Windows eco-system. Failure to maintain and grow our presence in these key eco-systems could adversely affect unit volumes.

Further, many of our products depend on the availability of certain functionality in the device operating system, typically Android, Linux, Windows, or iOS. Certain operating system primitives are needed to support video output. We have no control over these operating systems or the companies that produce them, and it is unlikely that we could influence any internal decision these companies make that may have a negative impact on our integrated circuits and their function. Updates to these operating systems that, for example, change the way video is output or remove the ability to output video could materially affect sales of MHL and HDMI integrated circuits.

Products targeted to personal computing or mobile, laptop, or notebook designs often require device driver software to operate. This software is difficult to produce and may require certifications before being released. Failure to produce this software could have a negative impact on our relation with operating system providers and may damage our reputation with end consumers as a quality supplier of products.

We may experience difficulties in transitioning to smaller geometry process technologies or in achieving higher levels of design integration, which may result in reduced manufacturing yields, delays in product deliveries, and increased expenses.

To remain competitive, we expect to continue to transition our semiconductor products to increasingly smaller geometries. This requires us to change the manufacturing processes for our products and to redesign some products as well as standard cells and other integrated circuit designs we may use in multiple products. We periodically evaluate the benefits, on a product-by-product basis, of migrating to smaller geometry process technologies to reduce our costs. The transition to lower nanometer geometry process technologies will result in significantly higher mask and prototyping costs, as well as additional expenditures for engineering design tools.

We depend on our relationships with our foundry partners to transition to smaller geometry processes successfully. We make no assurance that our foundry partners will be able to effectively manage the transition in a timely manner, or at all. If we or any of our foundry partners experience significant delays in this transition or fail to efficiently implement this transition, 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.

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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 materially exceeds market supply, our supply of silicon wafers or assembly material could quickly become limited. 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 gross margins will be adversely affected.

We depend on independent contractors for most of our assembly and test services, and disruption of these services, or an increased in cost of these services, could negatively impact our financial condition and results of operations.

We depend on subcontractors to assemble, test, and ship our products with acceptable quality and yield levels. 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. Those problems include: prolonged inability to obtain wafers or packaging materials with competitive performance and cost attributes; inability to achieve adequate yields or timely delivery; disruption or defects in assembly, test, or shipping services; or delays in stabilizing manufacturing processes or ramping up volume for new products,. Economic conditions may adversely impact the financial health and viability of our subcontractors and result in their inability to meet their commitments to us resulting in product shortages, quality assurance problems, reduced revenue, and/or increased costs which could negatively impact our financial condition and results of operations.

In the past, we have experienced delays in obtaining assembled and tested products and in securing assembly and test capacity commitments from our suppliers. We currently anticipate that our assembly and test capacity commitments are adequate; however, these existing commitments may not be sufficient for us to satisfy customer demand in future periods. We negotiate assembly and test prices and capacity commitments from our contractors on a periodic basis. If any of our assembly or test contractors reduce their capacity commitment or increase their prices, and we cannot find alternative sources, our operating results could be adversely affected.

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 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 excess and obsolete inventories and corresponding inventory write-downs. 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.

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.

Our participation in HDMI and MHL includes our acting as agent for these consortia for which we receive adopter fees. There is no guarantee that we will continue to act as agent for either or both of these standards, in which case we

may lose adopter fees.

Through our wholly owned subsidiary, HDMI Licensing, LLC, we act as agent of the HDMI consortium and are responsible for promoting and administering the specification. We receive all of the adopter fees paid by adopters of the HDMI specification in connection with our role as agent. We are currently in discussions with the other HDMI founders regarding a restructuring of our role as agent. While not concluded, we believe these discussions will likely result in a narrowing of our agent functions, resulting in a lowering of the adopter fees received by us in the future.

We share HDMI royalties with the other HDMI founders based on an allocation formula, which is reviewed every three years. The current royalty sharing formula covers the period from January 1, 2014 through December 31, 2016. Our portion of the royalty allocation has declined for the last several years, and in 2015 we received between 24% to 25% of the royalty allocation. If the level of this royalty allocation continues to decline, our financial performance could be adversely affected.

Through our wholly owned subsidiary, MHL, LLC, we act as agent of the MHL specification and are responsible for promoting and administering the specification. As agent, we are entitled to receive license fees paid by adopters of the MHL specification sufficient to reimburse us for the costs we incur to promote and administer the specification. Given the limited number of MHL adopters to date, we do not believe the license fees paid by such adopters will be sufficient to reimburse us for these costs and we make no assurance that the license fees paid by MHL adopters will ever be sufficient to reimburse us the costs we incur as agent of the specification.

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We currently intend to promote and continue to be involved and actively participate in other standard setting initiatives. For example, through Silicon Image's acquisition of SiBEAM, Inc. in May 2011, it achieved SiBEAM's prior position as founder and chair of the WirelessHD Consortium. We may decide to license additional elements of our intellectual property to others for use in implementing, developing, promoting, or adopting standards in our target markets, in certain circumstances at little or no cost. This may make it easier for others to compete with us in such markets. In addition, even if we receive license fees or royalties in connection with the licensing of our intellectual property, we make no assurance that such license fees or royalties will compensate us adequately.

We rely on information technology systems, and failure of these systems to function properly may cause business disruptions.

We rely in part on various information technology ("IT") 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. We are undergoing a significant integration and systems implementation as we integrate the operations and systems of Silicon Image into our operations and systems following the acquisition. Any delay in the implementation of, or disruption in the transition to or integration of, new or enhanced systems, procedures, or controls, could harm our ability to record and report financial and management information on a timely and accurate basis. In addition, we are presently upgrading our main enterprise resource planning system, which if not completed on time and as planned, could result in cost overruns or limit our ability to manufacture and ship products as planned. These systems are also subject to power and telecommunication outages or other general system failures. Failure of our IT systems or difficulties or delays in managing and integrating them could result in excessive cost or business disruption.

Our failure to control unauthorized access to our IT systems may cause problems with key business partners or liability.

We may be subject to unauthorized access to our IT systems through a security breach or cyber-attack. In the ordinary course of our business, we maintain sensitive data on our networks, including our intellectual property and proprietary or confidential business information relating to our business and that of our customers and business partners. The secure maintenance of this information is critical to our business and reputation. We believe that companies have been increasingly subject to a wide variety of security incidents, cyber-attacks, and other attempts to gain unauthorized access. Cyber-attacks have become more prevalent and much harder to detect and defend against. Our network and storage applications may be subject to unauthorized access by hackers or breached due to operator error, malfeasance, or other system disruptions. It is often difficult to anticipate or immediately detect such incidents and to assess the damage caused by them. In the past, third parties have attempted to penetrate and/or infect our network and systems with malicious software in an effort to gain access to our network and systems.

These data breaches and any unauthorized access or disclosure of our information or intellectual property could compromise our intellectual property and expose sensitive business information. Cyber-attacks could also 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. Our reputation, brand, and business could be significantly harmed, and we could be subject to third party claims in the event of such a security breach.

Foreign sales, accounting for the majority of our revenue, are subject to various risks associated with selling in international markets, which could have a material adverse effect on our operations, financial condition, and results of operations.

We derive the majority of our revenue from sales outside of the United States. Accordingly, if we experience a decline in foreign sales, our operating results could be adversely affected. Our foreign sales are subject to numerous risks, including:

- changes in local economic conditions;
- currency exchange rate volatility;
- governmental stimulus packages, controls, and trade restrictions;
- governmental policies that promote development and consumption of domestic products;
- export license requirements, foreign trade compliance matters, and restrictions on the use of technology;
- political instability, war, terrorism, or pandemic disease;
- changes in tax rates, tariffs, or freight rates;
- reduced protection for intellectual property rights;
- longer receivable collection periods;
- natural or man-made disasters in the countries where we sell our products;
- interruptions in transportation;
- interruptions in the global communication infrastructure; and
- labor regulations.

Any of these factors could adversely affect our financial condition and results of operations in the future.

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We have significant international operations exposing us to various economic, regulatory, political, and business risks, which could have a material adverse effect on our operations, financial condition, and results of operations.

We have significant international operations, including foreign sales offices to support our international customers and distributors, and operational and research and development sites in China, India, 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 act