AXT INC
Form 10-K
March 11, 2016
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

(Mark One)
ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2015
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: 000-24085

AXT, INC.

(Exact name of registrant as specified in its charter)

Delaware	94-3031310
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
4281 Technology Drive, Fremont, California	94538
(Address of principal executive offices)	(Zip Code)

Registrant’s telephone number, including area code: (510) 438-4700

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

Title of each class	Name of each exchange on which registered
Common Stock, $0.001	The NASDAQ Stock Market LLC

par value
Securities registered pursuant to Section 12(g) of the Act:

None

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

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

Indicate by checkmark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15 (d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

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

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

Indicate by checkmark 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 Act. (Check one):

		reporting company)	
Large accelerated filer	Accelerated filer	Non accelerated filer	Smaller reporting company
		(Do not check if a smaller reporting company)	

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

The aggregate market value of the voting stock held by non-affiliates of the registrant, based upon the closing sale price of $2.52 for the common stock on June 30, 2015 as reported on the Nasdaq Global Select Market, was approximately $69,585,000. Shares of common stock held by each officer, director and by each person who owns 5% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not a conclusive determination for other purposes.

As of March 7, 2016, 32,341,176 shares, $0.001 par value, of the registrant's common stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the registrant's 2016 annual meeting of stockholders to be filed with the Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this form are incorporated by reference into Part III of this Form 10-K report. Except for those portions specifically incorporated

by reference herein, such document shall not be deemed to be filed with the Commission as part of this Form 10-K.

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PART I

This Annual Report (including the following section regarding Management's Discussion and Analysis of Financial Condition and Results of Operations) contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended. Statements relating to our expectations regarding results of operations, customer demand, customer qualifications of our products, our ability to expand our markets or increase sales, the development of new products, applications, enhancements or technologies, gross margins, expense levels, the impact of the adoption of certain accounting pronouncements, our investments in capital projects and our belief that we have adequate cash and investments to meet our needs over the next 12 months are forward-looking statements. Words such as "expects," "anticipates," "intends," "plans," "believes," "seeks," "estimates," "goals," "should," "continues," "would," similar expressions or variations of such words are intended to identify forward looking statements, but are not the exclusive means of identifying forward looking statements in this Annual Report. Additionally, statements concerning future matters such as our strategy, plans, industry trends and the impact of trends and economic cycles on our business are forward-looking statements. All forward-looking statements are based upon management's views as of the date of this Annual Report and are subject to risks and uncertainties that could cause actual results to differ materially from historical results or those anticipated in such forward-looking statements. Such risks and uncertainties include those set forth under the section entitled "Risk Factors" in Item 1A below, as well as those discussed elsewhere in this Annual Report, and identify important factors that could disrupt or injure our business or cause actual results to differ materially from those predicted in any such forward-looking statements.

These forward-looking statements are not guarantees of future performance. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. Readers are urged to carefully review and consider the various disclosures made in this report, which attempt to advise interested parties of the risks and factors that may affect our business, financial condition, results of operations and prospects. We undertake no obligation to revise or update any forward looking statements in order to reflect any development, event or circumstance that may arise after the date of this report.

Item 1. Business

AXT, Inc. ("AXT", "we," "us," and "our" refer to AXT, Inc. and its consolidated subsidiaries) is a worldwide developer and producer of high-performance compound and single element semiconductor substrates, also known as wafers. The dominant substrates used in producing semiconductor chips and other electronic circuits are made from silicon. However, certain chips may become too hot or perform their function too slowly if silicon is used as the base material. Alternative or specialty materials are used to replace silicon as the preferred base for the electronic circuits in these situations. We provide such alternative or specialty materials in the form of substrates or wafers, including compound and single element substrates. Our compound substrates combine indium with phosphorous (InP) or gallium with arsenic (GaAs). Our single element substrates are made from germanium (Ge). Historically, most of our revenue has been derived from sales of semi-insulating and semi-conducting GaAs substrates. However, in 2015, our revenue from sales of InP substrates was greater than our revenue from our sales of each type of GaAs substrates. We currently sell the following substrate products in the sizes and for the applications indicated:

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Substrates	Substrate Diameter	Applications
InP	2”, 3”, 4”	•Fiber optic lasers and detectors •Data center connectivity •Silicon photonics •Opto Electronics ICs •Terrestrial solar cells (CPV) •Lasers •VCSELs (vertical cavity surface emitting lasers)
GaAs (semi-insulating)	1”, 2”, 3”, 4”, 5”, 6”	•Power amplifiers and radio frequency integrated circuits for wireless handsets (cell phones) •Direct broadcast television •High-performance transistors •Satellite communications
GaAs (semi-conducting)	1”, 2”, 3”, 4”, 6”	•High brightness light emitting diodes (LEDs) •Lasers •VCSELs (vertical cavity surface emitting lasers) •Printer heads •Optical couplers
Ge	2”, 4”, 6”	•Satellite and terrestrial solar cells •Optical sensors and detectors

We manufacture all of our products in the People’s Republic of China (PRC or China), which generally has favorable costs for facilities and labor compared with comparable facilities in the United States, Europe or Japan. Our supply chain includes partial ownership of ten companies in China (joint ventures). We believe this supply chain arrangement provides us with pricing advantages, reliable supply and enhanced sourcing lead-times for key raw materials which are central to our final manufactured products. Our subsidiaries and joint venture companies produce products including 99.99% pure gallium (4N Ga), high purity gallium, arsenic, germanium, germanium dioxide, pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). Our ownership and the ownership held by our consolidated subsidiaries in these entities range from 83% to 20%. We have board representation in all ten of these companies. We consolidate the joint ventures in which we have either a controlling financial interest, or majority financial interest combined with the ability to exercise control in substance over the operation or financial decisions made by the

investee. We use the equity method to account for joint ventures in which we have smaller financial interest and have the ability to exercise significant influence, but not control, over the investee. We purchase portions of the materials produced by these joint venture companies for our own use and the joint venture companies sell the remainder of their production to third parties.

We were incorporated in California in December 1986 and reincorporated in Delaware in May 1998. We changed our name from American Xtal Technology, Inc. to AXT, Inc. in July 2000. Our principal corporate office is located at 4281 Technology Drive, Fremont, California 94538, and our telephone number at this address is (510) 438-4700.

Industry Background

Certain electronic and opto-electronic applications have performance requirements that exceed the capabilities of conventional silicon substrates and often require high-performance compound or single element substrates. Examples of higher performance non-silicon based substrates include GaAs, InP, gallium nitride (GaN), silicon carbide (SiC) and Ge.

For example, integrated circuits for wireless handsets and other wireless devices, power amplifier integrated circuits and some radio frequency integrated circuits are made with semi-insulating GaAs substrates. Semi-conducting GaAs substrates are used to create opto-electronic products, including high brightness light emitting diodes (HBLEDs) that are often used to backlight wireless handsets and liquid crystal display (LCD) TVs and also used for automotive

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panels, signage, display and lighting applications. InP is a high performance semiconductor substrate used in broadband and fiber optic applications and data center connectivity. Ge substrates are used in applications such as solar cells for space and terrestrial photovoltaic applications.

The AXT Advantage

We believe that we benefit from the following advantages:

- Key leadership in InP technology and revenue growth. We have invested in InP research and development for a number of years and have developed a strong base of proprietary technology that we continue to expand. We experienced over 50% InP year on year revenue growth in 2015 as market applications and demand gained traction. We believe there are significant barriers to entry in the InP substrate market and we are a leading provider of such wafers or substrates. Further, we believe that this market will continue to expand and grow.
- Low-cost manufacturing operation in China. We have manufactured all of our products in China since 2004, which generally has favorable costs for facilities and labor compared to costs of comparable facilities and labor in the United States, Japan or Europe. As of December 31, 2015, approximately 1,021 of our 1,045 employees (including employees at our consolidated joint venture companies) are located in China. Our primary competitors have their major manufacturing operations in Germany or Japan.
- Our diverse product offering results in a broader range of customers and applications. We offer a diverse range of products, which enables us to have a broad range of customers. For the year ended December 31, 2015, only one customer accounted for over 10% of revenue and our five largest customers accounted for 40% of our revenue. We believe this diversity enabled us to recover quickly when a large portion of GaAs chips was replaced with silicon-on-insulator (SOI) chips in mobile phone switches, beginning in 2011. Further, we believe this diversity gives us a greater likelihood to expand our business into new applications and markets and benefit from growth in demand for substrates given our pre-established market positions in a broad range of product applications.
- We have partial ownership in ten companies in China that form our sophisticated, vertically integrated supply chain. We believe our subsidiaries and joint venture companies in China provide us with more reliable supply and shorter lead-times for the raw materials central to our final manufactured products compared to third party providers. These materials include gallium, gallium alloys, indium phosphide poly-crystal, germanium, germanium dioxide, high purity arsenic, pyrolytic boron nitride crucibles (pBN) and boron oxide (B2O3). We believe this dedicated supply chain will enable us to meet increases in demand from our customers by providing an increased volume of raw materials quickly, efficiently and cost effectively.
- Enhanced revenue diversity through the sale of special materials. Because our strategy allows our subsidiaries to also sell in the open market to third parties, approximately a quarter of our total sales are from non-substrate products, providing further diversity in our customer base and business model.
- Business model unique among current competitors. We believe we are the only publicly traded company focused on high-performance compound and single element semiconductor substrates. Most of our direct competitors are either privately owned companies or divisions of large publicly traded companies. We believe the combination of access to U.S. capital markets, U.S.-based product quality standards and China-based manufacturing is an attractive business model to our customers who desire longevity and stability in their supply chain as well as competitive prices.
- Strong cash position with $44 million cash and investments. As a pure play substrate provider we have a strong cash position that enables us to make strategic investments in equipment, technology and resources. Our competitive focus and flexibility is supported by the staying power that this cash ensures.

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Strategy

Our goal is to become the leading worldwide supplier of high-performance compound and single element semiconductor substrates. Key elements of our strategy include:

Invest in growing InP revenue and protect our proprietary process technology. We are adding manufacturing capacity for InP to support the revenue growth for this product line. Substrate products often have a very long product life cycle and we believe the InP revenue growth trajectory could be similar to the GaAs product life cycle that ran for more than 10 years. In addition to adding manufacturing capacity, we will continue to invest in InP crystal growth technology, wafer processing technology, market development and customer support.

Offer diverse products, including custom products. We believe AXT has a reputation in the market place for providing a broad range of products, including custom products. We plan to further promote this brand image as a way to differentiate ourselves in the market place. Some competitors provide only gallium arsenide substrates. We provide gallium arsenide and also indium phosphide and germanium substrates. Some competitors provide only six inch wafers. Our wafers range from one inch up to six inches. We also produce substrates with customer defined specifications which may range from thickness or smoothness and may include adding special additional chemicals such as iron or sulfur. We believe product diversity can mitigate some of the impact of down cycles in our market because we are not dependent on a single product or application for revenue.

Many customers not just a few large customers. We seek to expand our customer base and avoid dependence on just a few large customers. We believe our diverse product offering has resulted in a diverse customer base. For the year ended December 31, 2015, only one customer accounted for over 10% of revenue and our five largest customers accounted for 40% of our revenue. We believe customer diversity provides a measure of stability in troubled market conditions. Customer diversification may also enable us to achieve a higher average selling price by reducing our dependence on larger customers with pricing power.

China-based manufacturing. We seek to leverage our China-based manufacturing advantage by increasing efficiencies in our manufacturing methods, systems and processes. In 1998 we decided to locate our manufacturing in China and in 1999 we began to move our manufacturing facilities to the outskirts of Beijing. Approximately 98% of our employees are based in China. This enables us to compete more effectively against our competitors who, by comparison, are in relatively high cost locations such as Japan and Germany. We plan to further leverage these advantages by investing in training and equipment to increase productivity and reduce cost. It is our strategy to combine the benefits of U.S.-based quality and U.S.-based access to capital markets with China-based manufacturing.

Increase productivity and profitability in our 10 subsidiaries/joint venture companies. AXT's substrate products are based on specialty materials, many of which are mined and refined in China. The supply and demand equation for specialty materials can be complex and can be volatile. Our strategy to maintain a stable supply chain has been to establish and nurture startup companies in China where we have a majority ownership position or at least a significant equity position. Over the years we have established or invested in 10 companies that are an integral part of our supply chain. We will continue to provide strategic support to these companies and they, in turn, will continue to be the backbone of our supply chain. We plan to work closely with these companies to increase their productivity and improve their profitability as they continue to support AXT's supply chain.

Sell raw materials into the market place. We leverage the established capabilities of our 10 subsidiaries and joint ventures by authorizing them to sell materials into the open market, including to some of our direct competitors.

Promote AXT's longevity and stability. We believe recent market trends, including the exit of one of our major competitors in Japan from the gallium arsenide substrate market, has highlighted supply continuity concerns among

our customers. Since AXT was established in 1986 and has been a publicly traded company since 1998, we plan to promote our long operating history and highlight our position as a stable, reliable and long term provider of substrates and materials by among other things, investing in research and development and high-end processing equipment.

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Materials of the future. The specialty materials substrate market is dynamic and subject to continued changes and cycles. We plan to use our deep knowledge and experience in specialty materials and wafer substrates to seek new applications for existing substrates in our portfolio and explore additional materials that may be synergistic with our knowledge base, customer needs and manufacturing lines.

Technology

Wafers serve as a cornerstone in semiconductor device fabrication, on which integrated circuits and devices are fabricated. Wafers are sliced up from semiconducting ingots that are grown in the form of cylindrical shape single crystals. Depending on physical properties of the supporting materials, the performance of devices and circuits can be remarkably different.

AXT uses its' proprietary Vertical Gradient Freeze (VGF) technique for growing single crystal Indium Phosphide (InP), Gallium Arsenide (GaAs) and Germanium (Ge) ingots used to produce state-of-the-art wafers for diverse electronic and opto-electronic device and circuit applications.

InP and GaAs semiconducting compounds are formed combining elements from Groups III and V in the periodic table of elements, whereas Ge is a Group IV elemental semiconductor. Each of these materials has unique properties that determine the best device and/or circuit applications. As a result of their special high electron mobility combined with their direct ban-gap properties, both InP and GaAs wafers have enjoyed dominant roles in the production of Light Emitting Diodes (LEDs), Solid-state Lasers and Power Amplifiers for mobile phones, to name a few applications. Ge wafers, on the other hand, have played a key role in the manufacturing of special solar cells known as Triple Junction Solar Cells (TJSCs) for space and terrestrial power generation.

With the recent evolution in several applications InP lasers are projected to play a dominant role in the optoelectronics arena, e.g. silicon photonics (where InP lasers are a key component) and autonomous cars (where special wavelength InP-based lasers are used for object sensing and collision avoidance). Crystal growth process technology frequently contains steps and procedures that are considered proprietary secrets held by the producer, often including methods to control the temperature within the crucible. InP crystal growth relies on extreme pressure within the crucible. As such it requires not only temperature control methodologies, but also pressure control and stabilization process methodologies, many of which are proprietary trade secrets. It is this combination of variables and the required methods to control them that create a barrier to entry.

We believe our long-term investment in InP research and development has resulted in a substantive body of proprietary knowledge. In addition, to complement our VGF proprietary growth expertise, in July 2015, we acquired the InP proprietary process technology and crystal growth equipment from Crystacomm, Inc., thus adding the capability of growing polycrystalline and large diameter single crystal InP ingots using the Crystacomm proprietary Liquid Encapsulated Czochralski (LEC) technology. Crystacomm has a long history in development and experimentation in InP and this acquisition transfers the proprietary technology to us.

After growing the crystalline ingot, the material is then sawed into individual substrates or wafers. We have continued to invest in wafer processing technology covering each step in the process from sawing to edge smoothing to final cleaning and we believe we have technology and trade secrets addressing the scope of wafer processing. One focus in our recent development programs has been on automation. In this regard, in October 2015, we announced that we had acquired Hitachi Metals' automated equipment and the related intellectual property portfolio. A significant body of knowledge in this portfolio is considered proprietary trade secrets. We expect to combine the acquired proprietary processing technology and equipment with our existing wafer processing capabilities to better serve our existing and future customer base.

Products

We design, develop, manufacture and distribute high-performance semiconductor substrates, also known as wafers. InP is a high-performance semiconductor substrate used in fiber optic lasers and detectors, data center connectivity, silicon photonics, optoelectronic ICs, terrestrial solar cell (CPV), lasers and VCSELs. We make semi-

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insulating GaAs substrates used in making semiconductor chips in applications such as amplifiers and switches for wireless devices. Our semi-conducting GaAs substrates are used to create opto-electronic products including High Brightness LEDs, which are often used to backlight wireless handsets and LCD TVs and for automotive, signage, display and lighting applications. Ge substrates are used in emerging applications such as triple junction solar cells for space and terrestrial photovoltaic applications and for optical applications.

The table below sets forth our products and selected applications:

Substrates	Substrate Diameter	Applications
InP	2”, 3”, 4”	•Fiber optic lasers and detectors •Data center connectivity •Silicon photonics •Opto Electronics ICs •Terrestrial solar cells (CPV) •Lasers •VCSELs (vertical cavity surface emitting lasers)
GaAs (semi-insulating)	1”, 2”, 3”, 4”, 5”, 6”	•Power amplifiers and radio frequency integrated circuits for wireless handsets (cell phones) •Direct broadcast television •High-performance transistors •Satellite communications
GaAs (semi-conducting)	1”, 2”, 3”, 4”, 6”	•High brightness light emitting diodes (LEDs) •Lasers •VCSELs (vertical cavity surface emitting lasers) •Printer heads •Optical couplers
Ge	2”, 4”, 6”	•Satellite and terrestrial solar cells •Optical sensors and detectors

Substrates. We currently sell compound substrates manufactured from InP and GaAs, as well as single element substrates manufactured from Ge. We supply InP substrates in two-, three and four-inch diameters, and Ge substrates

in two-, four- and six-inch diameters. We supply both semi-insulating and semiconducting GaAs substrates in one -, two-, three , four-, five- and six-inch diameters. Many of our customers require customized specifications such as special levels of iron or sulfur dopants or the wafer thickness.

We have a long operating history and offer a relatively broad range of products. We promote our product diversity as a way to differentiate ourselves in the market place. Some competitors provide only gallium arsenide substrates. We provide gallium arsenide and also indium phosphide and germanium substrates. Some competitors provide only six inch wafers. Our wafers range from one inch up to six inches. We also produce substrates with customer defined specifications which may range in thickness or smoothness and may include adding special additional chemicals such as iron or sulfur. In addition to our wafers or substrates we also generate revenue from our consolidated subsidiaries who sell raw materials. Product diversity can mitigate some of the down cycles in our market because we are not dependent on a single product or application for revenue.

Materials. We have partial ownership in 10 companies in China that sell raw materials that may be used in substrate manufacturing or for other purposes. These companies produce products including 99.99% pure gallium (4N Ga), high purity gallium (7N Ga), gallium alloys, indium phosphide poly-crystal, germanium, germanium dioxide, high purity arsenic, pyrolytic boron nitride crucibles and boron oxide.

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Customers

Before specialty material wafers can be processed in a typical wafer manufacturing facility that constructs the electronic circuit on a chip, a thin layer of structured chemicals is grown on the surface of the substrate. This is called an epitaxial layer. We sell our substrates to companies that apply the epitaxial layer, who then in turn sell the modified wafers to the wafer fabs, chip design companies, LED manufacturers and others.

Epitaxial layer companies that form our customer base are located in Europe, the United States and Asia. We also sell product to universities and other research organizations who use specialty materials for experimentation in various aspects of semiconducting and semi insulating applications.

We have at times sold a significant portion of our products in any particular period to a limited number of customers. One customer represented more than 10% of our revenue for the year ended December 31, 2015 while there was no customer who represented more than 10% of our revenue for the years ended December 2014 and 2013. Our top five customers, although not the same five customers for each period, represented 40%, 34% and 31% of our revenue for the years ended December 31, 2015, 2014 and 2013, respectively.

There were three third-party customers for the raw materials products from our consolidated subsidiaries that accounted for 13%, 13% and 13% of the revenue from raw materials sales for the year ended December 31, 2015 and three customers for the raw materials products from our subsidiaries and joint ventures that accounted for 20%, 13% and 11% of the revenue from raw materials sales for the year ended December 31, 2014 and three customers for the raw materials products from our subsidiaries and joint ventures that accounted for 11%, 10% and 10% of the revenue from raw materials sales for the year ended December 31, 2013. Our subsidiaries and joint ventures are a key strategic benefit for us as they further diversify our sources of revenue.

Manufacturing, Raw Materials and Supplies

We manufacture all of our wafers/substrate products at our facilities in Beijing, China. We believe this location generally has favorable costs for facilities and labor compared to the United States or compared to the location of some of our competitors in Japan and Germany.

We use a two-stage manufacturing process. The first stage deploys our VGF technology for the crystal growth of single element or compound element ingots in diameters currently ranging from one inch to six inch. The growth process occurs in high temperature furnaces built using our proprietary designs. Growing the crystalline elements into cylindrical ingots can take four to twelve days, depending on the diameter and length of the ingot produced. The second stage includes slicing or sawing the ingot into wafers or substrates, then processing each substrate to strict specifications, including grinding to reduce the thickness and then polishing and cleaning each substrate. Many of the process steps utilize proprietary knowledge and chemical baths.

Wafers from each ingot will include some material that does not meet specifications or quality standards. Defects may occur as a result of inherent factors in the materials used in the crystalline growth process. They may also result from variances in the manufacturing process. We have many steps in our line that are partially or fully automated but other manufacturing steps are performed manually. We intend to increase the level of automation. In 2015, we purchased wafer processing equipment from Hitachi Metals that we expect will increase automation in our production line and, therefore, reduce variability and defects. In addition, we secured a manufacturing license from Hitachi Metals. This license includes detailed work instructions for using the equipment purchased and allows us to apply the proprietary wafer processing technology at any step and on any form of equipment in our line. We expect to deploy this equipment in stages during 2016. Due to potential defects, yield is a key factor in our manufacturing cost. Other key elements are the initial cost of the raw material elements, manufacturing equipment, factory loading, facilities and

labor. Our Beijing facilities are approximately 300,000 square feet and we employ approximately 677 employees at this site. We believe our current employee base is appropriate for our current production volume. In 2015, we also acquired equipment from an InP company, Crystacomm, that specializes in the LEC method of crystal growth. The Crystacomm equipment is being installed in our Fremont, CA facility.

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We have formed 10 subsidiaries and joint ventures companies in China that form the backbone of our supply chain model. These companies provide us with reliable supply and shorter lead-times for raw materials central to our manufactured products including gallium, gallium alloys, indium phosphide poly-crystal, germanium, germanium dioxide, high purity arsenic, pBN and boron oxide . We believe that these subsidiaries and joint ventures have been and will continue to be advantageous in allowing us to procure materials to support our planned growth. In addition, we purchase supply parts, components and raw materials from several other domestic and international suppliers. We depend on a single or limited number of suppliers for certain critical materials used in the production of our substrates, such as quartz tubing and polishing solutions. We generally purchase our materials through standard purchase orders and not pursuant to long-term supply contracts.

Sales and Marketing

We sell our substrate products directly to customers through our direct salesforce in the United States and China and through independent sales representatives and distributors in Europe and other areas of Asia. Our direct salesforce is knowledgeable in the use of compound and single element substrates. Our application engineers work with customers during all stages of the substrate manufacturing process, from developing the precise composition of the substrate through manufacturing and processing the substrate to the customer's specifications. We believe that maintaining a close relationship with customers and providing them with ongoing engineering support improves customer satisfaction and will provide us with a competitive advantage in selling other substrates to our customers. Six of our employees who frequently work with customers have PhDs in physics or material science, illustrating our serious commitment to customer support.

International Sales. International sales are a substantial part of our business. Sales to customers outside North America (primarily the United States) accounted for approximately 87%, 88% and 88% of our revenue during 2015, 2014 and 2013, respectively. The primary markets for sales of our substrate products outside of the United States are to customers located in Asia and Western Europe.

Our subsidiaries and joint venture companies sell specialty raw materials including 4N, 5N, 6N, 7N and 8N gallium, boron oxide, germanium, arsenic, germanium dioxide, pyrolytic boron nitride crucibles used in crystal growth and parts for MBE (Molecular Beam Epitaxy). These subsidiaries and joint ventures have their own separate sales forces and sell directly to their own customers in addition to selling raw materials to us.

Research and Development

To maintain and improve our competitive position, we focus our research and development efforts on designing new proprietary processes and products, improving the performance of existing products, increasing yields and reducing manufacturing costs. We also conduct research and development focusing on larger diameter wafers and in our history we have consistently developed new products based on larger wafer diameters. Crystal growth of specialty earth materials becomes significantly more difficult as the ingot diameter increases because a consistent temperature, and in the case of InP, consistent control of the pressure, must be applied over a larger surface area. In 2015 we acquired certain proprietary crystal growth technology from Crystacomm.

Our current substrate research and development activities focus on continued development and enhancement of GaAs, InP and Ge substrates, including improved yield, enhanced surface and electrical characteristics and uniformity, greater substrate strength and increased crystal length. In 2015 we acquired a significant number of proprietary wafer processing stations from Hitachi Metals. The Hitachi Metals purchase includes a license covering the use of the proprietary equipment and Hitachi Metals' proprietary wafer processing technology.

Our three consolidated subsidiaries conduct research and development focusing on gallium alloys, gallium refinement and pyrolytic boron nitride crucibles used in high temperature crystal growth.

We have assembled a multi disciplinary team of skilled scientists, engineers and technicians to meet our research and development objectives. Research and development expenses were $5.7 million in 2015, compared with $4.1 million in 2014 and $3.4 million in 2013.

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Competition

The semiconductor substrate industry is characterized by rapid technological change and price erosion, as well as intense competition. We compete in the market for GaAs substrates with our expertise in VGF technology, product quality, response times and prices. However, we face actual and potential competition from a number of established companies that may have advantages not available to us, including substantially greater financial, technical and marketing resources; greater name recognition; and more established relationships in the industry, and they may utilize these advantages to expand their product offerings more quickly, adapt to new or emerging technologies and changes in customer requirements more quickly, and devote greater resources to the marketing and sale of their products.

We believe that the primary competitive factors in the markets in which our substrate products compete are:

- quality;
- price;
- performance;
- meeting customer specifications;
- customer support; and
- manufacturing capacity.

Our ability to compete in target markets also depends on factors such as:

- the timing and success of the development and introduction of new products, including larger diameter wafers, and product features by us and our competitors;
- the availability of adequate sources of raw materials;
- protection of our proprietary methods, systems and process;
- protection of our products by effective use of intellectual property laws; and
- general economic conditions.

The large majority of our customers specialize in epitaxial growth, a chemical layer grown on top of our wafers. Typically our customer or prospective customer has at least two substrate suppliers qualified for the production of its products. Qualified suppliers must meet industry standard specifications for quality, on-time delivery and customer support. Once a substrate supplier has qualified with a customer, price, consistent quality and current and future product delivery lead times become the most important competitive factors. A supplier that cannot meet a customer's current lead times or that a customer perceives will not be able to meet future demand and provide consistent quality can lose market share. Our primary competition in the market for compound semiconductor substrates includes Freiberger Compound Materials, JX, Umicore, Sumitomo Electric Industries and China Crystal Technology Corp., (CCTC). We believe that at least two of our competitors are shipping high volumes of GaAs substrates manufactured using a technique similar to our VGF technique. In addition, we also face competition from semiconductor device manufacturers that produce substrates for their own use, and from companies, such as TriQuint Semiconductors, RFMD and Skyworks that are actively developing alternative materials and marketing semiconductor devices using these alternative materials. For example, silicon-on-insulator (SOI) technology, a silicon wafer technology that produces satisfactory devices at lower cost, has been proven in the market. From 2011 to 2013, SOI technology displaced GaAs chips in key sectors, primarily the radio frequency (RF) switching function in cell phones.

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Because of our vertically integrated, sophisticated supply chain through our subsidiaries and joint venture companies, we believe we are the only compound semiconductor substrate supplier to offer a full suite of raw materials. We believe this gives us a unique competitive advantage because we have greater control and stability over the needed materials. Further, we believe we have some advantage in manufacturing costs.

Protection of our Intellectual Property

Our success and the competitive position of our VGF technology depend on our ability to maintain our proprietary trade secrets and other intellectual property protections. We rely on a combination of patents, trademark and trade secret laws, non-disclosure agreements and other intellectual property protection methods to protect our proprietary technology. We believe that, due to the rapid pace of technological innovation in the markets for our products, our ability to establish and maintain a position of technology leadership depends as much on the skills of our research and development personnel as upon the legal protections afforded our existing technologies. To protect our trade secrets, we take certain measures to ensure their secrecy, such as executing non-disclosure agreements with our employees, customers and suppliers. However, reliance on trade secrets is only an effective business practice insofar as trade secrets remain undisclosed and a proprietary product or process is not reverse engineered or independently developed.

To date, we have been issued forty-four (44) patents that relate to our VGF products and processes, ten (10) in the United States (US), four (4) in Japan (JP), twenty-five (25) in China, one (1) in Europe, one (1) in Canada, one (1) in Korea, and two (2) in Taiwan. Patents have a protected life of 20 years from filing date. Our patents have expiration dates ranging from one expiration in 2016 to 2032. In some cases we may consider filing divisional, continuation or continuation-in-part of the existing patents for additional claims. We have two (2) US patent applications pending and seventeen (17) foreign patent applications pending including patent applications in Europe (3), China (10) and Japan (4). Furthermore, in aggregate, our three consolidated joint venture companies have been issued 44 patents in China.

In the normal course of business, we periodically receive and make inquiries regarding possible patent infringement. In dealing with such inquiries, it may become necessary or useful for us to obtain or grant licenses or other rights. However, there can be no assurance that such licenses or rights will be available to us on commercially reasonable terms. If we are not able to resolve or settle claims, obtain necessary licenses on commercially reasonable terms and/or successfully prosecute or defend our position, our business, financial condition and results of operations could be materially and adversely affected.

Environmental Regulations

We are subject to federal, state and local environmental laws and regulations, including laws in China as well as in the United States and Europe. These laws, rules and regulations govern the use, storage, discharge and disposal of hazardous chemicals during manufacturing, research and development and sales demonstrations. We maintain a number of environmental, health and safety programs that are primarily preventive in nature. As part of these programs, we regularly monitor ongoing compliance. If we fail to comply with applicable regulations, we could be subject to substantial liability for personal injury, clean-up efforts, fines and suspension or cessation of our operations. The regulatory landscape shifts and changes in China as that country attempts to address its environmental pollution. Because we manufacture all of our products in China, we are subject to an evolving regulatory administration requiring changes in our equipment and securing new permits.

Employees

As of December 31, 2015, we had approximately 702 employees, which consisted of approximately 25 employees in our headquarters in Fremont and approximately 677 employees in Beijing. In addition, our three consolidated subsidiaries had, in total, approximately 343 employees. In aggregate, we and our subsidiaries had 1,045 employees, of whom 851 were principally engaged in manufacturing, 121 in sales and administration, and 73 in research and development. Of these 1,045 employees, 25 were located in the United States and 1,020 in China.

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Most workers in China are represented by unions. As of December 31, 2015, 879 employees in China including employees of our subsidiaries were represented by unions, but we have never experienced a work stoppage. We consider our relations with our employees to be good.

Geographical Information

Please see Note 15 of our Notes to Consolidated Financial Statements for information regarding our foreign operations, and see “Risks related to international aspects of our business” under Item 1A. Risk Factors for further information on risks attendant to our foreign operations and dependence.

Available Information

Our principal executive offices are located at 4281 Technology Drive, Fremont, CA 94538, and our main telephone number at this address is (510) 438-4700. Our Internet website address is www.axt.com. Our website address is given solely for informational purposes; we do not intend, by this reference, that our website should be deemed to be part of this Annual Report on Form 10-K or to incorporate the information available at our Internet address into this Annual Report on Form 10 K.

We file electronically with the Securities and Exchange Commission, or SEC, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended. We make these reports available free of charge through our Internet website as soon as reasonably practicable after we have electronically filed such material with the SEC. These reports can also be obtained from the SEC’s Internet website at www.sec.gov or at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330.

Item 1A. Risk Factors

For ease of reference, we have divided these risks and uncertainties into the following general categories:

I. Risks related to our general business;
II. Risks related to international aspects of our business;
III. Risks related to our financial results and capital structure;
IV. Risks related to our intellectual property; and
V. Risks related to compliance, environmental regulations and other legal matters.

I. Risks Related to Our General Business

Silicon substrates (wafers) are significantly lower in cost compared to substrates made from specialty materials and new silicon-based technologies could allow silicon based substrates to replace specialty material based substrates for certain applications.

Historically silicon wafers or substrates are less expensive than specialty material substrates such as those that we produce. Electronic circuit designers will generally consider silicon first and only turn to alternative materials if silicon cannot provide the required functionality in terms of power consumption, speed or other specifications. Beginning in 2011 certain applications that had previously used GaAs substrates adopted a new silicon-based technology called Silicon On Insulator, or SOI. SOI technology uses a silicon-insulator-silicon layered substrate in place of conventional silicon substrates in semiconductor manufacturing. SOI substrates cost less than GaAs substrates and although their performance is not as robust as GaAs substrates in terms of power consumption, heat generation and speed they became acceptable in mobile phone and other applications that were previously dominated by GaAs

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substrates. The adoption of SOI resulted in decreased GaAs wafer demand, and decreased revenue. If SOI or similar technologies gain more widespread market acceptance, or are used in more applications, our business and operating results could be significantly and adversely affected.

Underutilizing our manufacturing facilities may result in declines in our gross margins.

An important factor in our success is the extent to which we are able to utilize the available capacity in our manufacturing facilities. A number of factors and circumstances may reduce utilization rates, including periods of industry overcapacity, low levels of customer orders, operating inefficiencies, mechanical failures and disruption of operations due to expansion, power interruptions, fire, flood or other natural disasters or calamities. Because many portions of our manufacturing costs are relatively fixed, high utilization rates are critical to our gross margins and operating results. If we fail to achieve acceptable manufacturing volumes or experience product shipment delays, our results of operations will be negatively affected. During periods of decreased demand, we have underutilized our manufacturing lines. If we are unable to improve utilization levels at our facilities during periods of decreased demand and correctly manage capacity, the fixed expense levels will have an adverse effect on our business, financial condition and results of operations. Our gross profit margins have fluctuated from period to period, and these fluctuations are expected to continue in the future. Our gross profit margin has fluctuated from 23.7% in the quarter ended March 31, 2015 to 17.1% for the quarter ended December 31, 2015.

In 2013, we concluded that incoming orders were insufficient and that we were significantly underutilizing our factory capacity. As a result, in February 2014, we announced a restructuring plan with respect to our wholly-owned subsidiary, Beijing Tongmei Xtal Technology Co, Ltd., or Tongmei, in order to better align manufacturing capacity with demand. Under the restructuring plan, we posted a charge of approximately $907,000 in the first quarter of 2014.

If we receive fewer customer orders than forecasted or if our customers delay or cancel orders, we may not be able to reduce our manufacturing costs in the short-term and our gross margins would be negatively affected. In addition, lead times required by our customers are shrinking which reduces our ability to forecast orders and properly balance our capacity utilization.

Our gross margin has fluctuated historically and may decline due to several factors.

Our gross profit margin has fluctuated from period to period as a result of shifts in product mix, the introduction of new products, decreases in average selling prices for products, utilization of our manufacturing capacity and our ability to reduce product costs. These fluctuations are expected to continue in the future.

We do not control the prices at which our subsidiaries and other joint venture companies sell their raw materials products to third parties. However, because we consolidate the results of three of these companies with our own, any reduction in their gross margins could have a significant, adverse impact on our overall gross margins. One or more of our companies has in the past, and may in the future, sell raw materials at significantly reduced prices in order to gain volume sales or sales to new customers. In addition, in the three months ended December 31, 2015, the market price of gallium dropped below our per unit inventory cost and we incurred an inventory write down under the lower of cost or market accounting rules. In such events, our gross margin may be adversely impacted. In addition, one of our consolidated subsidiaries has in the past been subject to capacity constraints requiring it to source product from other third party suppliers in order to meet customer demand, resulting in decreased gross margin and adversely impacting our gross margin. This joint venture may in the future continue to experience such capacity restraints, causing our gross margin, and consequently our operating results, to be adversely impacted.

Intense competition in the markets for our products could prevent us from increasing revenue and sustaining profitability.

The markets for our products are intensely competitive. We face competition for our substrate products from other manufacturers of substrates, such as Freiberger Compound Materials, JX, Umicore, Sumitomo Electric Industries and CCTC, from semiconductor device manufacturers that produce substrates for their own use, and from companies, such as TriQuint Semiconductors, RFMD and Skyworks that are actively developing alternative materials to GaAs and

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marketing semiconductor devices using these alternative materials. We believe that at least two of our major competitors are shipping high volumes of GaAs substrates manufactured using a technique similar to our VGF technology. Other competitors may develop and begin using similar technology. Sumitomo and JX also compete with us in the InP market. If we are unable to compete effectively, our revenue may not increase and we may not achieve profitability. We face many competitors that have a number of significant advantages over us, including:

- greater name recognition and market share in the business;
- more manufacturing experience;
- extensive intellectual property; and
- significantly greater financial, technical and marketing resources.

Our competitors could develop new or enhanced products that are more effective than our products.

The level and intensity of competition has increased over the past years and we expect competition to continue to increase in the future. Competitive pressures have resulted in reductions in the prices of our products, and continued or increased competition could reduce our market share, require us to further reduce the prices of our products, affect our ability to recover costs and result in reduced gross margins.

In addition, new competitors have and may continue to emerge, such as a crystal growing company established by a former employee in China that is supplying semi-conducting GaAs wafers to the LED market. Competition from sources such as this could increase, particularly if these competitors are able to obtain large capital investments.

If we have low product yields, the shipment of our products may be delayed and our product cost and operating results may be adversely impacted.

A critical factor in our product cost is yield. Our products are manufactured using complex technologies, and the number of usable substrates we produce can fluctuate as a result of many factors, including:

- impurities in the materials used;
- contamination of the manufacturing environment;
- quality control and inconsistency in quality levels;
- lack of automation and inconsistent processing requiring manual manufacturing steps;
- substrate breakage during the manufacturing process; and
- equipment failure, power outages or variations in the manufacturing process.

In addition, we may modify our process to meet a customer specification but this can impact our yield. If our yields decrease, our revenue could decline if we are unable to produce product to our customers' requirements. At the same time, our manufacturing costs could remain fixed, or could increase. We have experienced product shipment delays and difficulties in achieving acceptable yields on both new and older products, and delays and poor yields have adversely affected our operating results. We may experience similar problems in the future and we cannot predict when they may occur or their duration or severity.

If our manufacturing processes result in defects in our products making them unfit for use by our customers, our products would be rejected, resulting in compensation costs paid to our customers, and possible disqualification. This could lead to revenue loss and market share loss.

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The Chinese government has imposed, and may impose in the future, manufacturing restrictions and regulations that could require us to move part of our manufacturing operations to a location outside of the Beijing area or temporarily cease or limit manufacturing. Such restrictions would materially and adversely impact our results of operations and our financial condition.

The Beijing city government has announced that it will expand its offices into the area where our facility is located. The Beijing city government desires to upgrade this area and has begun to pressure some companies to relocate and, in some instances, is providing financial incentives for such relocation. If, in the future, we relocate all or part of our operations, this would require us to form an orderly relocation plan to do so and our failure to properly execute such a plan could result in disruptions to our production and have an adverse impact on our results of operations and financial condition. Further, the cost of a new facility could be prohibitive.

The Chinese government has in the past imposed temporary restrictions on manufacturing facilities, such as the restrictions imposed on polluting factories for the 2008 Olympics and the 2014 Asian Pacific Economic Cooperation ("APEC") event. These restrictions included a shut-down of the transportation of materials and power plants to reduce air pollution. To reduce air pollution in Beijing, the Chinese government has sometimes limited the construction of new, or expansion of existing, facilities by manufacturing companies in the Beijing area. If the government applied similar restrictions to us, then such restrictions could have an adverse impact on our results of operations and our financial condition. Our ability to supply current or new orders could be significantly impacted. Customers could then be required to purchase products from our competitors, causing our competitors to take market share from us.

In addition, from time to time, the Chinese government issues new regulations, which may require additional actions on our part to comply. On February 27, 2015, the China State Administration of Work Safety updated its list of hazardous substances. The previous list, which was published in 2002, did not restrict the materials that we use in our wafers. The new list added gallium arsenide. As a result of the newly published list, we were required to obtain a permit by May 1, 2015 to continue to manufacture our gallium arsenide substrate wafers. We initiated discussions with the local district agency to obtain the requisite permit. On May 4, 2015, we were instructed by the local district agency that because we had not yet received the requisite permit, we should cease manufacturing our gallium arsenide substrate wafers or we should obtain permission to continue manufacturing our gallium arsenide substrate wafers from a municipal-level office, such as the Beijing municipal authority. The Beijing municipal authority accepted our application on May 7, 2015 and our application is still under review. There can be no assurances that we will receive the requisite permit from the Beijing municipal authority or from any other Chinese governmental authority. If we do not receive the requisite permit to continue to manufacture gallium arsenide substrate wafers, we may be required to cease manufacturing such wafers until we receive the requisite permit or move such manufacturing to a new location. A halt to our production of gallium arsenide substrate wafers could result in our furloughing approximately several hundred manufacturing employees. If we obtain the requisite permit after halting our production, we might not be able to recommence manufacturing gallium arsenide substrate wafers immediately because we may need to rebuild our supply chain and we may not be able to rehire our furloughed manufacturing employees. We could also lose customers to our competitors because of our inability to supply gallium arsenide substrate wafers. Any of these could materially and adversely impact our results of operations and our financial condition.

Problems incurred in our 10 partially owned joint venture companies or investment partners could result in a material adverse impact on our financial condition or results of operations.

We have invested in subsidiaries and joint venture companies in China that produce materials including 99.99% pure gallium (4N Ga), high purity gallium (7N Ga), arsenic, germanium, germanium dioxide, pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). We purchase a portion of the materials produced by these companies for our use and they sell the remainder of their production to third parties. Our ownership and the ownership held by our consolidated subsidiaries in these entities ranges from 20% to 83%. We consolidate the companies in which we have a majority or controlling financial interest and employ equity accounting for the companies in which we have a smaller ownership interest. Several of companies occupy space within larger facilities owned and/or operated by one of the other venture partners. Several of these venture partners are engaged in other manufacturing activities at or near the same facility. In some facilities, we share access to certain functions, including water, hazardous waste treatment or air quality treatment. If any of our joint venture partners in any of these ventures experiences problems with its operations,

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disruptions of our joint venture operations could result, having a material adverse effect on the financial condition and results of operation of our joint venture companies, and correspondingly on our financial condition or results of operations. For example, since gallium is a by-product of aluminum, our raw gallium joint venture in China, which is housed in and receives services from an affiliated aluminum plant, could generate lower production of gallium as a result of reduced services provided by the aluminum plant. Accordingly, in order to meet customer supply obligations, our joint venture may have to source materials from another independent third party supplier, resulting in reduced gross margin.

In addition, if any of our joint ventures or venture partners with which our joint ventures share facilities is deemed to have violated applicable laws, rules or regulations governing the use, storage, discharge or disposal of hazardous chemicals during manufacturing, research and development or sales demonstrations, the operations of our joint ventures could be adversely affected and we could be subject to substantial liability for clean-up efforts, personal injury and fines or suspension or cessation of our joint venture operations as a result of the actions of the joint ventures or other venture partners. Employees working for our joint ventures or any of the other venture partners could bring litigation against us as a result of actions taken at the joint venture or venture partner facilities, even though we are not directly controlling the operations, including actions for exposure to chemicals or other hazardous materials at the facilities of our joint ventures or the facilities of any venture partner that are shared by our joint ventures. While we would expect to defend ourselves vigorously in any litigation that is brought against us, litigation is inherently uncertain and it is possible that our business, financial condition, results of operations or cash flows could be affected. Even if we are not deemed responsible for the actions of the joint ventures or venture partners, litigation could be costly, time consuming to defend and divert management attention; in addition, if we are deemed to be the most financially viable of the partners, plaintiffs may decide to pursue us for damages.

Since all of our partially owned companies reside in China, their activities could subject us to a number of risks associated with conducting operations internationally, including:

- difficulties in managing geographically disparate operations;
- difficulties in enforcing agreements through non-U.S. legal systems;
- unexpected changes in regulatory requirements that may limit our ability to manufacture, export the products of our joint venture companies or sell into particular jurisdictions or impose multiple conflicting tax laws and regulations;
- political and economic instability, civil unrest or war;
- terrorist activities that impact international commerce;
- difficulties in protecting our intellectual property rights, particularly in countries where the laws and practices do not protect proprietary rights to as great an extent as do the laws and practices of the United States;
- changing laws and policies affecting economic liberalization, foreign investment, currency convertibility or exchange rates, taxation or employment; and
- nationalization of foreign owned assets, including intellectual property.

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Our revenue, gross margins and profitability can be hurt if the average sales price of the various raw materials in our partially owned companies decreases.

Although the companies in our vertically integrated supply chain have historically made a positive contribution to our financial performance, the average selling prices for many of the raw materials produced have continued to decline and have had a negative impact on our recent financial performance. In particular, the selling prices for 4N gallium and for germanium have been driven down by oversupply and, in the second half of 2015, hurt our total revenue, reduced our gross margin and contributed to our net loss. There can be no assurance that the oversupply will be corrected by the market. Further, in Q4 2015 one of our consolidated subsidiaries incurred a lower of cost or market inventory write down which negatively impacted our consolidated gross margin. If the pricing environment remains stressed by oversupply and our joint venture companies cannot reduce their production cost, then the reduced average selling prices of the raw materials produced by our joint venture companies will have a continuing adverse impact on our revenue, gross margins and net profit.

Demand for our products may decrease if demand for the end-user applications decrease or if manufacturers downstream in our supply chain experience difficulty manufacturing, marketing or selling their products.

Our products are used as components in electronic products. Accordingly, demand for our products is subject to the demand for end-user applications which utilize our products, as well as factors affecting the ability of the manufacturers downstream in our supply chain to introduce and market their products successfully, including:

- the competition such manufacturers face in their particular industries;
- the technical, manufacturing, sales, marketing and management capabilities of such manufacturers;
- the financial and other resources of such manufacturers; and
- the inability of such manufacturers to sell their products if they infringe third party intellectual property rights.

If demand for the end-user applications for which our products are used decreases, or if manufacturers downstream in our supply chain are unable to develop, market and sell their products, demand for our products will decrease.

The average selling prices of our products may decline over relatively short periods, which may reduce our gross margins.

The market for our products is characterized by declining average selling prices resulting from factors such as increased competition, overcapacity, the introduction of new products and decreased sales of products incorporating our products and as a result average selling prices for our products may decline over relatively short time periods. We have in the past experienced, and in the future may experience, substantial period-to-period fluctuations in operating results due to declining average selling prices. For example, on average, for the year ended December 31, 2015 we experienced average selling price declines of approximately 5% to 15% depending on the substrates product. It is possible that the pace of average selling price declines could accelerate beyond these levels for certain products in a commoditizing market. We anticipate that average selling prices will decrease in the future in response to the unstable demand environment, product introductions by competitors or us, or by other factors, including pricing pressures from significant customers. When our average selling prices decline, our gross profits decline unless we are able to sell more products or reduce the cost to manufacture our products. We generally attempt to combat average selling price declines by improving yields, manufacturing efficiency and working to reduce the costs of our raw materials and of manufacturing our products. We have in the past and may in the future experience declining sales prices, which could negatively impact our revenues, gross profits and financial results. We therefore need to sell our current products in increasing volumes to offset any decline in their average selling prices, and introduce new products, which we may not be able to do, or do on a timely basis.

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We may be unable to reduce the cost of our products sufficiently to enable us to compete with others. Our cost reduction efforts may not allow us to keep pace with competitive pricing pressures and could adversely affect our margins. In order to remain competitive, we must continually reduce the cost of manufacturing our products through design and engineering changes. We cannot assure you that any changes effected by us will result in sufficient cost reductions to allow us to reduce the price of our products to remain competitive or improve our gross margins.

Defects in our products could diminish demand for our products.

Our products are complex and may contain defects, including defects resulting from impurities inherent in our raw materials or inconsistencies in our manufacturing processes. We have experienced quality control problems with some of our products, which caused customers to return products to us, reduce orders for our products, or both. We believe that we continue to experience certain reduction in orders as a result of product quality issues. If we experience quality control problems, or experience these or other problems in new products, customers may cancel or reduce orders or purchase products from our competitors and we may be unable to maintain or increase sales to our customers and sales of our products could decline. Defects in our products could cause us to incur higher manufacturing costs and suffer product returns and additional service expenses, all of which could adversely impact our operating results.

If new products developed by us contain defects when released, our customers may be dissatisfied and we may suffer negative publicity or customer claims against us, lose sales or experience delays in market acceptance of our new products.

The loss of one or more of our key substrate customers would significantly hurt our operating results.

Although there was only one customer that represented more than 10% of our revenue for the year ended December 31, 2015, we believe that a significant portion of our future revenue could to be derived from a limited number of substrate customers. Most of our customers are not obligated to purchase a specified quantity of our products or to provide us with binding forecasts of product purchases. In addition, our customers may reduce, delay or cancel orders at any time without any significant penalty. In the past, we have experienced slower bookings, significant push-outs and cancellation of orders from customers. If we lose a major customer or if a customer cancels, reduces or delays orders, or reduces the prices paid for our products, our revenue would decline. In addition, customers that have accounted for significant revenue in the past may not continue to generate revenue for us in any future period. Any delay in scheduled shipments of our products could cause revenue to fall below our expectations and the expectations of market analysts or investors, causing our stock price to decline.

The cyclical nature of the semiconductor industry may limit our ability to maintain or increase net sales and operating results during industry downturns.

The semiconductor industry is highly cyclical and periodically experiences significant economic downturns characterized by diminished product demand, resulting in production overcapacity and excess inventory in the markets we serve. A downturn can result in lower unit volumes and rapid erosion of average selling prices. The semiconductor industry has experienced significant downturns, often in connection with, or in anticipation of, maturing product cycles of both semiconductor companies' and their customers' products or a decline in general economic conditions. This may adversely affect our results of operations and the value of our business.

Our continuing business depends in significant part upon manufacturers of electronic and opto-electronic compound semiconductor devices, as well as the current and anticipated market demand for these devices and products using these devices. As a supplier to the compound semiconductor industry, we are subject to the business cycles that characterize the industry. The timing, length and volatility of these cycles are difficult to predict. The compound semiconductor industry has historically been cyclical due to sudden changes in demand, the amount of manufacturing

capacity and changes in the technology employed in compound semiconductors. The rate of changes in demand, including end demand, is high, and the effect of these changes upon us occurs quickly, exacerbating the volatility of these cycles. These changes have affected the timing and amounts of customers' purchases and investments in new technology. These industry cycles create pressure on our revenue, gross margin and net income.

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Our industry has in the past experienced periods of oversupply and that has resulted in significantly reduced prices for compound semiconductor devices and components, including our products, both as a result of general economic changes and overcapacity. When this occurs our operating results and financial condition are adversely affected. Oversupply causes greater price competition and can cause our revenue, gross margins and net income to decline. During periods of weak demand, customers typically reduce purchases, delay delivery of products and/or cancel orders of component parts such as our products. Further order cancellations, reductions in order size or delays in orders could occur and would materially adversely affect our business and results of operations. Actions to reduce our costs may be insufficient to align our structure with prevailing business conditions. We may be required to undertake additional cost-cutting measures, and may be unable to invest in marketing, research and development and engineering at the levels we believe are necessary to maintain our competitive position. Our failure to make these investments could seriously harm our business.

We base our planned operating expenses in part on our expectations of future revenue, and a significant portion of our expense is relatively fixed. If revenue for a particular quarter is lower than we expect, we likely will be unable to proportionately reduce our operating expenses for that quarter, which would harm our operating results. For example, in 2013, we experienced significantly declining gross margins due to the allocation of fixed costs across a lower volume of sales than anticipated.

We purchase critical raw materials and parts for our equipment from single or limited sources, and could lose sales if these sources fail to fill our needs.

We depend on a limited number of suppliers for certain raw materials, components and equipment used in manufacturing our products, including key materials such as quartz tubing from our vendor, Kaide, and polishing solutions. Although several of these raw materials are purchased from suppliers in which we hold an ownership interest, we generally purchase these materials through standard purchase orders and not pursuant to long-term supply contracts, and no supplier guarantees supply of raw materials or equipment to us. If we lose any of our key suppliers, our manufacturing efforts could be significantly hampered and we could be prevented from timely producing and delivering products to our customers. Prior to investing in our subsidiaries and joint ventures, we sometimes experienced delays obtaining critical raw materials and spare parts, including gallium, due to shortages of these materials and we could experience such delays again in the future due to shortages of materials and may be unable to obtain an adequate supply of materials. These shortages and delays could result in higher materials costs and cause us to delay or reduce production of our products. If we have to delay or reduce production, we could fail to meet customer delivery schedules and our revenue and operating results could suffer.

If we do not successfully develop new products to respond to rapidly changing customer requirements, our ability to generate revenue, obtain new customers, and retain existing customers may suffer.

Our success depends on our ability to offer new products, including larger diameter substrates, and product features that incorporate leading technology and respond to technological advances. In addition, our new products must meet customer needs and compete effectively on quality, price and performance. The life cycles of our products are difficult to predict. The markets for our products are characterized by rapid technological change, changing customer needs and evolving industry standards. If our competitors introduce products employing new technologies or performance characteristics, our existing products could become obsolete and unmarketable. During the past few years, we have seen our competitors selling more substrates manufactured using a crystal growth technology similar to ours, which has eroded our technological differentiation.

The development of new products can be a highly complex process, and we may experience delays in developing and introducing new products. Any significant delay could cause us to fail to timely introduce and gain market acceptance of new products. Further, the costs involved in researching, developing and engineering new products could be greater

than anticipated. If we fail to offer new products or product enhancements or fail to achieve higher quality products, we may not generate sufficient revenue to offset our development costs and other expenses or meet our customers' requirements.

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Our substrate products have a long qualification cycle that makes it difficult to plan our expenses and forecast our results.

New customers typically place orders with us for our substrate products three months to a year or more after our initial contact with them. The sale of our products may be subject to delays due to our customers' lengthy internal approval and evaluation processes. During this time, we may incur substantial expenses and expend sales, marketing and management efforts while the customers evaluate our products. These expenditures may not result in sales of our products. If we do not achieve anticipated sales in a period as expected, we may experience an unplanned shortfall in our revenue. As a result, we may not be able to cover expenses, causing our operating results to be adversely effected. In addition, if we fail to meet the product qualification requirements of the customer, we may not have another opportunity to sell products to this customer for many months or even years. In the current competitive climate, the average qualification and sales cycle for our products has lengthened even further and is expected to continue to make it difficult for us to forecast our future sales accurately. We anticipate that sales of any future substrate products will also have lengthy sales cycles and will, therefore, be subject to risks substantially similar to those inherent in the lengthy sales cycles of our current substrate products.

If any of our facilities are damaged by occurrences such as fire, explosion or natural disaster, we might not be able to manufacture our products.

The ongoing operation of our manufacturing and production facilities in China is critical to our ability to meet demand for our products. If we are not able to use all or a significant portion of our facilities for prolonged periods for any reason, we would not be able to manufacture products for our customers. For example, a fire or explosion caused by our use of combustible chemicals and high temperatures during our manufacturing processes or power interruption caused by severe weather conditions could render some or all of our facilities inoperable for an indefinite period of time. Actions outside of our control, such as earthquakes or other natural disasters, could also damage our facilities, rendering them inoperable. If we are unable to operate our facilities and manufacture our products, we would lose customers and revenue and our business would be harmed.

If China places restrictions on freight and transportation routes and on port of entry and departure this could result in shipping delays or increased costs for shipping.

In August 2015 there was an explosion at the Port of Tianjin, China. As a result of this incident the government placed some restrictions on importing certain materials and on freight routes used to transport these materials. We experienced some modest disruption from these restrictions. If the government were to place additional restrictions on the transportation of materials, then our ability to transport our raw materials or products could be limited and result in bottlenecks at shipping ports, affecting our ability to deliver products to our customers. During periods of such restrictions, we may increase our stock of critical materials (such as arsenic, gallium, and other chemicals) for use during the period that these restrictions are likely to last, which will increase our use of cash and increase our inventory level. Any of these restrictions could materially and adversely impact our results of operations and our financial condition.

The financial condition of our customers may affect their ability to pay amounts owed to us.

Many of our customers may be undercapitalized and cope with cash flow issues. Because of competitive market conditions, we frequently allow our customers extended payment terms when shipping products to them. Subsequent to our shipping a product, some customers have been unable to make payments when due, reducing our cash balances and causing us to incur charges to allow for a possibility that some accounts might not be paid. Customers may also be

forced to file for bankruptcy. If our customers do not pay their accounts we will be required to incur charges that would reduce our earnings.

We have made and may continue to make strategic investments in raw materials suppliers, which may not be successful and may result in the loss of all or part of our investment.

We have made investments through our subsidiaries and joint ventures in raw material suppliers in China, which provide us with opportunities to gain supplies of key raw materials that are important to our substrate business.

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These affiliates each have a market beyond that provided by us. We do not have influence over all of these companies and in some we have made only a strategic, minority investment. We may not be successful in achieving the financial, technological or commercial advantage upon which any given investment is premised, and we could end up losing all or part of our investment.

We depend on the continuing efforts of our senior management team and other key personnel. If we lose members of our senior management team or other key personnel, or are unable to successfully recruit and train qualified personnel, our ability to manufacture and sell our products could be harmed.

Our future success depends on the continuing services of members of our senior management team and other key personnel. Our industry is characterized by high demand and intense competition for talent, and the turnover rate can be high. We compete for qualified management and other personnel with other semiconductor companies. Our employees could leave our company with little or no prior notice and would be free to work for a competitor. If one or more of our senior executives or other key personnel were unable or unwilling to continue in their present positions, we may not be able to replace them easily or at all, and other senior management may be required to divert attention from other aspects of the business. The loss of any of these individuals or our ability to attract or retain qualified personnel could adversely affect our business.

Our results of operations may suffer if we do not effectively manage our inventory.

We must manage our inventory of raw materials, work-in-process and finished goods effectively to meet changing customer requirements, while keeping inventory costs down and improving gross margins. Although we seek to maintain sufficient inventory levels of certain materials to guard against interruptions in supply and to meet our near term needs, and have to date been able to obtain sufficient supplies of materials in a timely manner, in the future, we may experience shortages of certain key materials. Some of our products and supplies have in the past and may in the future become obsolete while in inventory due to changing customer specifications, or become excess inventory due to decreased demand for our products and an inability to sell the inventory within a foreseeable period. This would result in charges that reduce our gross profit. Furthermore, if market prices drop below the prices at which we value inventory, we may need to take a charge for a reduction in inventory values in accordance with the lower of cost or market valuation rule. We have in the past had to take inventory valuation and impairment charges. Any future unexpected changes in demand or increases in costs of production that cause us to take additional charges for un-saleable, obsolete or excess inventory, or to reduce inventory values, could adversely affect our results of operations.

Financial market volatility and adverse changes in the domestic and global economic environment could have a significant adverse impact on our business, financial condition and operating results.

We are subject to the risks arising from adverse changes and uncertainty in domestic and global economies. Uncertain global economic conditions and low or negative growth in China, Europe and the United States, along with volatility in the financial markets, increasing national debt and fiscal concerns in various regions, pose challenges to our industry. Currently China’s economy is slowing and this could impact our financial performance. Although we remain well-capitalized, the cost and availability of funds may be adversely affected by illiquid credit markets. Turbulence in U.S. and international markets and economies may adversely affect our liquidity, financial condition and profitability. Another severe or prolonged economic downturn could result in a variety of risks to our business, including:

- increased volatility in our stock price;
- increased volatility in foreign currency exchange rates;
- delays in, or curtailment of, purchasing decisions by our customers or potential customers either as a result of overall economic uncertainty or as a result of their inability to access the liquidity necessary to engage in purchasing

initiatives;

- increased credit risk associated with our customers or potential customers, particularly those that may operate in industries most affected by the economic downturn; and

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· impairment of our intangible or other assets.

In the recent past we experienced delays in customer purchasing decisions and disruptions in normal volume of customer orders that we believe were in part due to the uncertainties in the global economy and an adverse impact on consumer spending. During challenging and uncertain economic times and in tight credit markets, many customers delay or reduce technology purchases. Should similar events occur again, our business and operating results could be significantly and adversely affected.

Global economic conditions may have an impact on our business and financial condition in ways that we currently cannot predict.

Our operations and financial results depend on worldwide economic conditions and their impact on levels of business spending, which had deteriorated significantly in many countries and regions in previous years. Uncertainties in the financial and credit markets may cause our customers to postpone deliveries of ordered systems and placement of new orders and extended uncertainties may reduce future sales of our products and services. The revenue growth and profitability of our business depends on the overall demand for our substrates, and we are particularly dependent on the market conditions for the wireless, solid state illumination, fiber optics and telecommunications industries. Because the end users of our products are primarily large companies whose businesses fluctuate with general economic and business conditions, a softening of demand for products that use our substrates, caused by a weakening economy, may result in decreased revenue. Customers may find themselves facing excess inventory from earlier purchases, and may defer or reconsider purchasing products due to the downturn in their business and in the general economy. If market conditions deteriorate, we may experience increased collection times and greater write-offs, either of which could have a material adverse effect on our profitability and our cash flow.

Future tightening of credit markets and concerns regarding the availability of credit may make it more difficult for our customers to raise capital, whether debt or equity, to finance their purchases of capital equipment or of the products we sell. Delays in our customers' ability to obtain such financing, or the unavailability of such financing, would adversely affect our product sales and revenues and therefore harm our business and operating results. We cannot predict the timing, duration of or effect on our business of any future economic downturn or the timing or strength of any subsequent recovery.

We may not be able to identify additional complementary joint ventures.

Although we are not currently pursuing additional joint ventures, in the future we might continue to invest in additional joint ventures in order to remain competitive in our marketplace and ensure a supply of critical raw materials. However, we may not be able to identify additional complementary joint venture opportunities or, even once opportunities are identified, we may not be able to reach agreement on the terms of the venture with the other venture partners. Additional joint ventures could cause us to incur contingent liabilities or other expenses, any of which could adversely affect our financial condition and operating results.

The effect of terrorist threats and actions on the general economy could decrease our revenue.

Developed countries such as the United States and China continue to be on alert for terrorist activity. The potential near- and long-term impact terrorist activities may have in regards to our suppliers, customers and markets for our products and the economy is uncertain. There may be embargos of ports or products, or destruction of shipments or our facilities, or attacks that affect our personnel. There may be other potentially adverse effects on our operating results due to significant events that we cannot foresee. Since we perform all of our manufacturing operations in China, terrorist activity or threats against U.S. owned enterprises are a particular concern to us.

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II. Risks Related to International Aspects of Our Business

We derive a significant portion of our revenue from international sales, and our ability to sustain and increase our international sales involves significant risks.

Our revenue growth depends in part on the expansion of our international sales and operations. International sales represented over 80% of our revenue in each of the past three years since 2013. We expect that sales to customers outside the United States, particularly sales to customers in Japan, Taiwan and China, will continue to represent a significant portion of our revenue.

Currently, a significant percentage of our revenue is to customers headquartered in Asia. All of our manufacturing facilities and most of our suppliers are also located outside the United States. Managing our overseas operations presents challenges, including periodic regional economic downturns, trade balance issues, varying business conditions and demands, political instability, variations in enforcement of intellectual property and contract rights in different jurisdictions, differences in the ability to develop relationships with suppliers and other local businesses, changes in U.S. and international laws and regulations including U.S. export restrictions, fluctuations in interest and currency exchange rates, the ability to provide sufficient levels of technical support in different locations, cultural differences, shipping delays and terrorist acts or acts of war, among other risks. Many of these challenges are present in China, which represents a large potential market for semiconductor devices. Global uncertainties with respect to: (i) economic growth rates in various countries; (ii) sustainability of demand for electronics products; (iii) capital spending by semiconductor manufacturers; (iv) price weakness for certain semiconductor devices; (v) changing and tightening environmental regulations and (vi) political instability in regions where we have operations may also affect our business, financial condition and results of operations.

Our dependence on international sales involves a number of risks, including:

- changes in tariffs, import restrictions, export restrictions, or other trade barriers;
- unexpected changes in regulatory requirements;
- longer periods to collect accounts receivable;
- changes in export license requirements;
- political and economic instability;
- unexpected changes in diplomatic and trade relationships; and
- foreign exchange rate fluctuations.

Our sales are denominated in U.S. dollars, except for sales to our Chinese customers which are denominated in Renminbi and our Japanese customers which are denominated in Japanese yen. Increases in the value of the U.S. dollar could increase the price of our products in non-U.S. markets and make our products more expensive than competitors' products in these markets.

Denominating some sales in Japanese yen subjects us to fluctuations in the exchange rates between the U.S. dollar and the Japanese yen. For example, in the second half of 2014, the exchange rate of Japanese yen to U.S. dollar moved from 101.55 to 119.95 from June 30, 2014 to December 31, 2014. As a result, in 2014 we incurred foreign currency transaction exchange losses which are included in "other income (expense), net" on the consolidated statements of operations of $1.0 million. We incur transaction gains or losses resulting from the purchase and sale activities denominated in foreign currencies other than functional currencies at the respective consolidated entities. We accumulate translation gain or losses resulting from marking certain balance sheet assets and liabilities to the current market rate for

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those consolidated entities whose functional currencies are other than the reporting currency, which are recorded as component of “accumulated other comprehensive income (loss)” on the consolidated balance sheets.

The functional currency of our Chinese subsidiary and joint ventures is the local currency. If we do not effectively manage the risks associated with international sales, our revenue, cash flows and financial condition could be adversely affected.

Changes in tariffs, import or export restrictions, Chinese regulations or other trade barriers may reduce gross margins.

We may incur increases in costs due to changes in tariffs, import or export restrictions, or other trade barriers, unexpected changes in regulatory requirements, any of which could reduce our gross margins. For example, in July 2012, we received notice of retroactive value-added taxes (VATs) levied by the tax authorities in China which applied for the period from July 1, 2011 to June 30, 2012. We expensed the retroactive VATs of approximately $1.3 million in the quarter ended June 30, 2012, which resulted in a decrease in our gross margins. These VATs will continue to negatively impact our gross margins for the future quarters. Given the relatively fluid regulatory environment in China, there could be additional tax or other regulatory changes in the future. Any such changes could directly and materially adversely impact our financial results and general business condition.

Our operating results depend in large part on continued customer acceptance of our substrate products manufactured in China and continued improvements in product quality.

We manufacture all of our products in China, and source most of our raw materials in China. We have in the past experienced quality problems with our China manufactured products. Our previous quality problems caused us to lose market share to our competitors, as some customers reduced their orders from us until our surface quality was as good and consistent as that offered by competitors and instead allocated their requirements for compound semiconductor substrates to our competitors. If we are unable to continue to achieve customer qualifications for our products, or if we are unable to control product quality, customers may not increase purchases of our products, our China facility will become underutilized, and we will be unable to achieve revenue growth.

Changes in China’s political, social, regulatory or economic environments may affect our financial performance.

Our financial performance may be affected by changes in China’s political, social, regulatory or economic environments. The role of the Chinese central and local governments in the Chinese economy is significant. Chinese policies toward economic liberalization, and laws and policies affecting technology companies, foreign investment, currency exchange rates, taxation structure and other matters could change, resulting in greater restrictions on our ability to do business and operate our manufacturing facilities in China. Any imposition of surcharges or any increase in Chinese tax rates or reduction or elimination of Chinese tax benefits could hurt our operating results. The Chinese government could revoke, terminate or suspend our operating license for reasons related to environmental control over the use of hazardous materials, labor complaints, national security and similar reasons without compensation to us. If the Chinese government were to take any of these actions, we would be prevented from conducting all or part of our business. Any failure on our part to comply with governmental regulations could result in the loss of our ability to manufacture our products.

If there are power shortages in China, we may have to temporarily close our China operations, which would adversely impact our ability to manufacture our products and meet customer orders, and would result in reduced revenue.

In the past, China has faced power shortages resulting in power demand outstripping supply in peak periods. Instability in electrical supply has caused sporadic outages among residential and commercial consumers causing the Chinese government to implement tough measures to ease the energy shortage. If further problems with power

shortages occur in the future, we may be required to make temporary closures of our operations or of our subsidiary and joint venture operations. We may be unable to manufacture our products and would then be unable to meet customer orders except from inventory on hand. As a result, our revenue could be adversely impacted, and our relationships with our

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customers could suffer, impacting our ability to generate future revenue. In addition, if power is shut off at any of our facilities at any time, either voluntarily or as a result of unplanned brownouts, during certain phases of our manufacturing process including our crystal growth phase, the work in process may be ruined and rendered unusable, causing us to incur costs that will not be covered by revenue, and negatively impacting our cost of revenue and gross margins.

An outbreak of a contagious disease such as Ebola, Severe Acute Respiratory Syndrome (SARS) or the Avian Flu may adversely impact our manufacturing operations and some of our key suppliers and customers.

Any reoccurrence of SARS or an outbreak of a contagious disease, such as Avian Flu or Ebola, may cause us to temporarily close our manufacturing operations. Similarly, if one or more of our key suppliers is required to close for an extended period, we might not have enough raw material inventories to continue manufacturing operations. In addition, while we possess management skills among our China staff that enable us to maintain our manufacturing operations with minimal on-site supervision from our U.S. based staff, our business could also be harmed if travel to or from China and the United States is restricted or inadvisable. If our manufacturing operations were closed for a significant period, we could lose revenue and market share, which would depress our financial performance and could be difficult to recapture. Finally, if one of our key customers is required to close for an extended period, we might not be able to ship product to them, our revenue would decline and our financial performance would suffer.

III. Risks Related to Our Financial Results and Capital Structure

If we fail to manage periodic contractions, we may utilize our cash balances, resulting in the decline of our existing cash, cash equivalents and investment balances.

We anticipate that our existing cash resources will fund our operations and purchases of capital equipment, as well as provide adequate working capital for the next twelve months. However, our liquidity is affected by many factors including, among others, the extent to which we pursue additional capital expenditures, the level of our production, and other factors related to the uncertainties of the industry and global economies. If we fail to manage business contractions successfully we may draw down our cash reserves, which would adversely affect our financial condition, reduce our value and possibly impinge our ability to raise debt and equity funding in the future, at a time when we might need to raise additional cash. Accordingly, there can be no assurance that events in the future will not require us to seek additional capital or, if required, that such capital would be available on terms acceptable to us, if at all. As part of our effort to reduce costs, we may lose key staff, production resources and technology that we will need to replenish when end markets recover. These events could reduce our ability to grow profitably as markets recover.

Unpredictable fluctuations in our operating results could disappoint analysts or our investors, which could cause our stock price to decline.

We have experienced, and may continue to experience, significant fluctuations in our revenue, gross margins and earnings. Our quarterly and annual revenue and operating results have varied significantly in the past and may vary significantly in the future due to a number of factors, including:

- our ability to develop, manufacture and deliver high quality products in a timely and cost-effective manner;
- decline in general economic conditions or downturns in the industry in which we compete;
- fluctuations in demand for our products;
- expansion of our manufacturing capacity;
- expansion of our operations in China;

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- limited availability and increased cost of raw materials;
- the volume and timing of orders from our customers, and cancellations, push-outs and delays of customer orders once booked;
- fluctuation of our manufacturing yields;
- decreases in the prices of our or our competitors' products;
- costs incurred in connection with any future acquisitions of businesses or technologies; and
- increases in our expenses, including expenses for research and development.

Due to these factors, we believe that period-to-period comparisons of our operating results may not be meaningful indicators of our future performance.

A substantial percentage of our operating expenses are fixed, and we may be unable to adjust spending to compensate for an unexpected shortfall in revenue. As a result, any delay in generating revenue could cause our operating results to fall below the expectations of market analysts or investors, which could also cause our stock price to decline.

If our operating results and financial performance do not meet the guidance that we have provided to the public, our stock price may decline.

We provide public guidance on our expected operating and financial results. Although we believe that this guidance provides our stockholders, investors and analysts with a better understanding of our expectations for the future, such guidance is comprised of forward-looking statements subject to the risks and uncertainties described in this report and in our other public filings and public statements. Our actual results may not meet the guidance we have provided. If our operating or financial results do not meet our guidance or the expectations of investment analysts, our stock price may decline.

We have adopted certain anti-takeover measures that may make it more difficult for a third party to acquire us.

Our board of directors has the authority to issue up to 2,000,000 shares of preferred stock and to determine the price, rights, preferences and privileges of those shares without any further vote or action by the stockholders. The rights of the holders of common stock will be subject to, and may be adversely affected by, the rights of the holders of any preferred stock that may be issued in the future. The issuance of shares of preferred stock could have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock. We have no present intention to issue additional shares of preferred stock.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws may have the effect of delaying or preventing a merger, acquisition or change of control, or changes in our management, which could adversely affect the market price of our common stock. The following are some examples of these provisions:

- the division of our board of directors into three separate classes, each with three-year terms;
- the right of our board to elect a director to fill a space created by a board vacancy or the expansion of the board;
- the ability of our board to alter our amended and restated bylaws; and
- the requirement that only our board or the holders of at least 10% of our outstanding shares may call a special meeting of our stockholders.

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Furthermore, because we are incorporated in Delaware, we are subject to the provisions of Section 203 of the Delaware General Corporation Law. These provisions prohibit us from engaging in any business combination with any interested stockholder (a stockholder who owns 15% or more of our outstanding voting stock) for a period of three years following the time that such stockholder became an interested stockholder, unless:

- $66^2/_3$% of the shares of voting stock not owned by the interested stockholder approve the merger or combination, or
- the board of directors approves the merger or combination or the transaction which resulted in the stockholder becoming an interested stockholder.

Our common stock may be delisted from The Nasdaq Global Select Market, which could negatively impact the price of our common stock and our ability to access the capital markets.

Our common stock is listed on The Nasdaq Global Select Market. The bid price of our common stock has in the past closed below the $1.00 minimum per share bid price required for continued inclusion on The Nasdaq Global Select Market under Marketplace Rule 5450(a). If the bid price of our common stock remains below $1.00 per share for thirty consecutive business days, we could be subject to delisting from the Nasdaq Global Select Market.

Any delisting from The Nasdaq Global Select Market could have an adverse effect on our business and on the trading of our common stock. If a delisting of our common stock were to occur, our common stock would trade on the OTC Bulletin Board or on the “pink sheets” maintained by the National Quotation Bureau, Inc. Such alternatives are generally considered to be less efficient markets, and our stock price, as well as the liquidity of our common stock, may be adversely impacted as a result. Delisting from The Nasdaq Global Select Market could also have other negative results, including the potential loss of confidence by suppliers and employees, the loss of institutional investor interest and fewer business development opportunities, as well as the loss of liquidity for our stockholders.

IV. Risks Related to Our Intellectual Property

Intellectual property infringement claims may be costly to resolve and could divert management attention.

Other companies may hold or obtain patents on inventions or may otherwise claim proprietary rights to technology necessary to our business. The markets in which we compete are comprised of competitors that in some cases hold substantial patent portfolios covering aspects of products that could be similar to ours. We could become subject to claims that we are infringing patent, trademark, copyright or other proprietary rights of others. We have in the past been involved in lawsuits alleging patent infringement, and could in the future be involved in similar litigation. For example, we entered into a settlement agreement with Sumitomo Electric Industries in 2011 to settle its claim of patent infringement.

If we are unable to protect our intellectual property, including our proprietary process technology, we may lose valuable assets or incur costly litigation.

We rely on a combination of patents, copyrights, trademarks, trade secrets and trade secret laws, non-disclosure agreements and other intellectual property protection methods to protect our proprietary technology. However, we believe that, due to the rapid pace of technological innovation in the markets for our products, our ability to establish and maintain a position of technology leadership also depends on the skills of our development personnel. We believe that our internal, non-patented proprietary process technology methods, systems and processes are a valuable and critical element of our intellectual property. We must establish and maintain safeguards to avoid the theft of these processes. Despite our efforts to protect our intellectual property, third parties can develop products or processes similar to ours. Our means of protecting our proprietary rights may not be adequate, and our competitors may independently develop similar technology, duplicate our products or design around our patents. We believe that at least two of our competitors have begun to ship GaAs substrates produced using a process similar to our VGF process. Our competitors may also develop and patent improvements to the VGF technology upon which we rely, and thus

may limit any exclusivity we enjoy by virtue of our patents or trade secrets.

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It is possible that pending or future United States or foreign patent applications made by us will not be approved, that our issued patents will not protect our intellectual property, or that third parties will challenge our ownership rights or the validity of our patents. In addition, the laws of some foreign countries may not protect our proprietary rights to as great an extent as do the laws of the United States and it may be more difficult to monitor the use of our intellectual property. Our competitors may be able to legitimately ascertain non-patented proprietary technology embedded in our systems. If this occurs, we may not be able to prevent the development of technology substantially similar to ours.

We may have to resort to costly litigation to enforce our intellectual property rights, to protect our trade secrets or know-how or to determine their scope, validity or enforceability. Enforcing or defending our proprietary technology is expensive, could cause us to divert resources and may not prove successful. Our protective measures may prove inadequate to protect our proprietary rights, and if we fail to enforce or protect our rights, we could lose valuable assets.

V. Risks Related to Compliance and Other Legal Matters

We need to continue to improve or implement our systems, procedures and controls.

We rely on certain manual processes for data collection and information processing, as do our joint venture companies. If we fail to manage these procedures properly or fail to effectively manage a transition from manual processes to automated processes, our systems and controls may be disrupted. To manage our business effectively, we may need to implement additional management information systems, further develop our operating, administrative, financial and accounting systems and controls, add experienced senior level managers, and maintain close coordination among our executive, engineering, accounting, marketing, sales and operations organizations.

We are subject to internal control evaluations and attestation requirements of Section 404 of the Sarbanes Oxley Act.

Pursuant to Section 404 of the Sarbanes Oxley Act of 2002, we must include in our Annual Report on Form 10-K a report of management on the effectiveness of our internal control over financial reporting. Ongoing compliance with this requirement is complex, costly and time-consuming. If: (1) we fail to maintain effective internal control over financial reporting; or (2) our management does not timely assess the adequacy of such internal control, we could be subject to regulatory sanctions and the public’s perception of us may be adversely impacted.

If we fail to comply with environmental and safety regulations, we may be subject to significant fines or forced to cease our operations; in addition, we could be subject to suits for personal injuries caused by hazardous materials.

We are subject to federal, state and local environmental and safety laws and regulations in all of our operating locations, including laws and regulations of China, such as laws and regulations related to the development, manufacture and use of our products, the use of hazardous materials, the operation of our facilities, and the use of our real property. These laws and regulations govern the use, storage, discharge and disposal of hazardous chemicals during manufacturing, research and development, and sales demonstrations. If we fail to comply with applicable regulations, we could be subject to substantial liability for clean-up efforts, personal injury and fines or suspension or be forced to cease our operations, and/or suspend or terminate the development, manufacture or use of certain of our products, the use of our facilities, or the use of our real property, each of which could have a material adverse effect on our business, financial condition and results of operations.

From time to time, the Chinese government issues new regulations, which may require additional actions on our part to comply. On February 27, 2015, the China State Administration of Work Safety updated its list of hazardous substances. The previous list, which was published in 2002, did not restrict the materials that we use in our wafers. The new list added gallium arsenide. As a result of the newly published list, we were required to obtain a permit by May 1, 2015 to continue to manufacture our gallium arsenide substrate wafers. We initiated discussions

with the local district agency to obtain the requisite permit. On May 4, 2015, we were instructed by the local district agency that because we had not yet received the requisite permit, we should cease manufacturing our gallium arsenide substrate wafers or we should obtain permission to continue manufacturing our gallium arsenide substrate wafers from a municipal-level office, such as the Beijing municipal authority. The Beijing municipal authority accepted our application on May 7, 2015 and

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our application is still under review. There can be no assurances that we will receive the requisite permit from the Beijing municipal authority or from any other Chinese governmental authority. If we do not receive the requisite permit to continue to manufacture gallium arsenide substrate wafers, we may be required to cease manufacturing such wafers until we receive the requisite permit or move such manufacturing to a new location. A halt to our production of gallium arsenide substrate wafers could result in our furloughing approximately several hundred manufacturing employees. If we obtain the requisite permit after halting our production, we might not be able to recommence manufacturing gallium arsenide substrate wafers immediately because we may need to rebuild our supply chain and we may not be able to rehire our furloughed manufacturing employees. We could also lose customers to our competitors because of our inability to supply gallium arsenide substrate wafers. Any of these could materially and adversely impact our results of operations and our financial condition.

In addition, in 2005, a complaint was filed against us alleging personal injury, general negligence, intentional tort, wage loss and other damages, including punitive damages, as a result of exposure of plaintiffs to high levels of gallium arsenide in gallium arsenide wafers, and methanol. Other current and/or former employees could bring litigation against us in the future. Although we have in place engineering, administrative and personnel protective equipment programs to address these issues, our ability to expand or continue to operate our present locations could be restricted or we could be required to acquire costly remediation equipment or incur other significant expenses if we were found liable for failure to comply with environmental and safety regulations. Existing or future changes in laws or regulations in the United States and China may require us to incur significant expenditures or liabilities, or may restrict our operations. In addition, our employees could be exposed to chemicals or other hazardous materials at our facilities and we may be subject to lawsuits seeking damages for wrongful death or personal injuries allegedly caused by exposure to chemicals or hazardous materials at our facilities.

Litigation is inherently uncertain and while we would expect to defend ourselves vigorously, it is possible that our business, financial condition, results of operations or cash flows could be affected in any particular period by litigation pending and any additional litigation brought against us. In addition, future litigation could divert management’s attention from our business and operations, causing our business and financial results to suffer. We could incur defense or settlement costs in excess of the insurance covering these litigation matters, or that could result in significant judgments against us or cause us to incur costly settlements, in excess of our insurance limits.

Item 1B. Unresolved Staff Comments

None.

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Item 2. Properties

Our principal properties as of March 7, 2016 are as follows:

Location	Square Feet	Principal Use	Ownership
Fremont, CA	19,467	Administration	Operating lease, expires November 2017
Beijing, China	300,000	Production and Administration	Owned by AXT / Tongmei
Xianxi, China	56,500	Production	Owned by Beijing JiYa Semiconductor Material, Co., Ltd.*
Xianxi, China	7,500	Administration	Owned by Beijing JiYa Semiconductor Material, Co., Ltd.*
Beijing, China	2,000	Administration	Operating lease by Beijing JiYa Semiconductor Material, Co., Ltd., expires February 2016
Nanjing, China	22,000	Production	Owned by Nanjing Jin Mei Gallium Co., Ltd.*
Nanjing, China	5,700	R&D and Administration	Owned by Nanjing Jin Mei Gallium Co., Ltd.*
Nanjing, China	3,900	Production	Owned by Nanjing Jin Mei Gallium Co., Ltd.*
Beijing, China	14,720	Production	Owned by BoYu Semiconductor Vessel Craftwork Technology Co., Ltd.*
Beijing, China	7,600	Production and Administration	Operating leases by BoYu Semiconductor Vessel Craftwork Technology Co., Ltd., expire in various terms until June 2018.*

*Joint ventures in which we hold an interest and consolidate in our financial statements. We hold a 46% interest in Beijing JiYa Semiconductor Material Co., Ltd., a 83% interest in Nanjing Jin Mei Gallium Co., Ltd., and a 70% interest in Beijing BoYu Semiconductor Vessel Craftwork Technology Co., Ltd.

We consider each facility to be in good operating condition and adequate for its present use, and believe that each facility has sufficient plant capacity to meet its current and anticipated operating requirements.

Item 3. Legal Proceedings

From time to time we may be involved in judicial or administrative proceedings concerning matters arising in the ordinary course of business. We do not expect that any of these matters, individually or in the aggregate, will have a material adverse effect on our business, financial condition, cash flows or results of operation.

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

Our common stock has been trading publicly on the NASDAQ Global Select Market (NASDAQ) under the symbol "AXTI" since May 20, 1998, the date we consummated our initial public offering, and beginning on January 3, 2011, our common stock began trading on the NASDAQ Global Select Market under the same symbol. The following table sets forth the range of high and low sales prices of the common stock for the periods indicated, as reported by NASDAQ.

	High	Low
2015		
First Quarter	$ 3.05	$ 2.36
Second Quarter	$ 2.70	$ 2.22
Third Quarter	$ 2.59	$ 1.91
Fourth Quarter	$ 2.70	$ 1.90
2014		
First Quarter	$ 2.67	$ 2.20
Second Quarter	$ 2.32	$ 2.06
Third Quarter	$ 3.04	$ 2.04
Fourth Quarter	$ 2.88	$ 2.08

As of March 7, 2016, there were 72 holders of record of our common stock. Because many shares of AXT's common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of beneficial owners of our common stock.

We have never paid or declared any cash dividends on our common stock and do not anticipate paying cash dividends in the foreseeable future. Dividends accrue on our outstanding Series A preferred stock at the rate of $0.20 per annum per share of Series A preferred stock. The 883,000 shares of $0.001 par value Series A preferred stock issued and outstanding as of both December 31, 2015 and 2014 are valued at $3,532,000 and are non-voting and non-convertible preferred stock with a 5.0% cumulative annual dividend rate payable when declared by our board of directors, and $4 per share liquidation preference over common stock, and must be paid before any distribution is made to common stockholders. These preferred shares were issued to Lyte Optronics, Inc. stockholders in connection with the completion of our acquisition of Lyte Optronics, Inc. on May 28, 1999.

Issuer Purchases of Equity Securities

On February 21, 2013, our Board of Directors approved a stock repurchase program pursuant to which we could repurchase up to $6.0 million of our outstanding common stock through February 27, 2014. The purchases could be made from time to time in the open market and were to be funded from our existing cash balances and cash generated from operations. During 2013, we repurchased approximately 285,000 shares at an average price of $2.52 per share for a total purchase price of $716,000 under the stock repurchase program. As of December 31, 2013, approximately $5.3 million remained available for future repurchases under this program. No shares were repurchased in 2014 under this program and the plan expired on February 27, 2014.

On October 27, 2014, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $5.0 million of our outstanding common stock. These repurchases can be made from time to time in the open market and are funded from our existing cash balances and cash generated from operations. During 2015, we repurchased approximately 908,000 shares at an average price of $2.52 per share for a total purchase price of approximately $2.3 million under the stock repurchase program. As of December 31, 2015, approximately $2.7 million remained available for future repurchases under this program. The following table provides additional details regarding our repurchase activity during the three months ended December 31, 2015:

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Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximately Dollar Value of Shares that May Yet be Purchased Under the Plans or Programs (in thousands)
October 1, 2015 - October 31, 2015	16,588	$ 1.97	16,588	$ 2,714
November 1, 2015 - November 30, 2015	—	$ —	—	$ 2,714
December 1, 2015 - December 31, 2015	—	$ —	—	$ 2,714

Comparison of Stockholder Return

Set forth below is a line graph comparing the annual percentage change in the cumulative total return to the stockholders of the Company on our common stock with the CRSP Total Return Index for the Nasdaq Stock Market (U.S. Companies) and the Nasdaq Electronic Components Index for the period commencing December 31, 2010 and ending December 31, 2015.

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	12/10	12/11	12/12	12/13	12/14	12/15
AXT, Inc.	100	39.94	26.92	25.00	26.82	23.75
NASDAQ Composite	100	100.53	116.9	166	188.78	199.95
NASDAQ Electronic Components	100	90.64	91.50	127.54	167.91	168.98

Item 6. Selected Consolidated Financial Data

The following selected consolidated financial data is derived from and should be read in conjunction with our consolidated financial statements and related notes set forth in Item 8 below, and in our previously filed reports on Form 10 K. See also Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations” for further information relating to items reflecting our results of operations and financial condition.

	Year Ended December 31,				
	2015	2014	2013	2012	2011
	(in thousands, except per share data)				
Statements of Operations Data:					
Revenue	$ 77,502	$ 83,499	$ 85,335	$ 88,374	$ 104,121
Cost of revenue	60,673	66,332	73,507	63,522	59,339
Gross profit	16,829	17,167	11,828	24,852	44,782
Operating expenses:					
Selling, general, and administrative	16,064	14,970	16,066	15,419	14,836
Research and development	5,664	4,144	3,424	3,468	2,473
Restructuring charge	—	907	—	—	—
Total operating expenses	21,728	20,021	19,490	18,887	17,309
Income (loss) from operations	(4,899)	(2,854)	(7,662)	5,965	27,473
Interest income, net	412	483	408	518	449
Equity in earnings of unconsolidated joint ventures	462	1,528	1,377	1,281	741
Other income (expense), net	2,023	361	(748)	(761)	(45)
Income (loss) before provision for income taxes	(2,002)	(482)	(6,625)	7,003	28,618
Provision for income taxes	531	215	188	853	2,795
Net income (loss)	(2,533)	(697)	(6,813)	6,150	25,823
Less: Net (income) loss attributable to noncontrolling interests	305	(691)	(1,145)	(3,040)	(5,503)
Net income (loss) attributable to AXT, Inc.	$ (2,228)	$ (1,388)	$ (7,958)	$ 3,110	$ 20,320
Net income (loss) attributable to AXT, Inc. per common share:					
Basic	$ (0.07)	$ (0.05)	$ (0.25)	$ 0.09	$ 0.63
Diluted	$ (0.07)	$ (0.05)	$ (0.25)	$ 0.09	$ 0.61
Shares used in per share calculations:					
Basic	32,183	32,452	32,700	32,144	31,872

Diluted	32,183	32,452	32,700	32,865	33,061

	December 31,				
	2015	2014	2013	2012	2011
	(in thousands)				
Balance Sheet Data:					
Cash and cash equivalents	$ 24,875	$ 28,814	$ 24,961	$ 30,634	$ 26,156
Investments	19,128	20,123	22,644	19,461	14,486
Working capital	84,047	88,422	84,114	93,376	92,220
Total assets	151,896	161,517	163,822	167,589	162,488
Current liabilities	12,841	14,771	15,426	13,096	10,883
Long-term debt, net of current portion	—	—	—	—	—
Stockholders' equity	137,561	144,688	145,546	150,914	147,049

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Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

In addition to historical information, the following discussion contains forward looking statements that are subject to risks and uncertainties. Actual results may differ substantially from those referred to herein due to a number of factors, including but not limited to risks described in the section entitled Item 1A. "Risk Factors" and elsewhere in this Annual Report. This discussion should be read in conjunction with Item 6. "Selected Consolidated Financial Data" and our consolidated financial statements and related notes included elsewhere in this Form 10-K.

On August 11, 2014, we announced the appointment of Mr. Gary L. Fischer as the Company's Vice President, Chief Financial Officer and Corporate Secretary, effective as of August 11, 2014. Dr. Morris S. Young, Chief Executive Officer of the Company relinquished his role as Interim Chief Financial Officer and Corporate Secretary of the Company, effective as of August 11, 2014.

On April 17, 2015, Mr. Davis Zhang notified us of his decision to resign as our President, China Operations. His resignation was effective May 15, 2015.

On June 29, 2015, we announced the appointment of Dr. Hong Q. Hou as the Company's Chief Operating Officer. On January 6, 2016, Dr. Hou notified us of his decision to resign as Chief Operating Officer of the Company. His resignation was effective January 8, 2016.

Restructuring Charges

On February 25, 2014, we announced a restructuring plan with respect to our wholly-owned subsidiary, Beijing Tongmei Xtal Technology Co, Ltd., or Tongmei, in order to better align manufacturing capacity with demand. Under the restructuring plan, Tongmei implemented certain workforce reductions with respect to its manufacturing facility in China. We reduced the workforce at Tongmei by approximately 93 positions that were no longer required to support production and operations, or approximately 11 percent of our workforce. We recorded a restructuring charge of approximately $907,000 related to the reduction in force for severance-related expenses. This restructuring plan and reduction in force has been completed as of March 31, 2014.

Critical Accounting Policies and Estimates

We prepare our consolidated financial statements in accordance with accounting principles generally accepted in the United States of America. Accordingly, we make estimates, assumptions and judgments that affect the amounts reported on our consolidated financial statements. These estimates, assumptions and judgments about future events and their effects on our results cannot be determined with certainty, and are made based upon our historical experience and on other assumptions that are believed to be reasonable under the circumstances. These estimates may change as new events occur or additional information is obtained, and we may periodically be faced with uncertainties, the outcomes of which are not within our control and may not be known for a prolonged period of time.

We have identified the policies below as critical to our business operations and understanding of our financial condition and results of operations. Critical accounting policies are material to the presentation of our consolidated financial statements and require us to make difficult, subjective or complex judgments that could have a material effect on our financial condition and results of operations. They may require us to make assumptions about matters that are highly uncertain at the time of the estimate. Different estimates that we could have used, or changes in the estimate that are reasonably likely to occur, may have a material impact on our financial condition or results of operations. We also refer you to Note 1 to our consolidated financial statements included elsewhere in this Form 10-K.

Revenue Recognition

We manufacture and sell high-performance compound semiconductor substrates including indium phosphide, semi-conducting and semi-insulating gallium arsenide and germanium wafers, and our three consolidated subsidiaries sell certain raw materials including 99.99% pure gallium (4N Ga), high purity gallium (7N Ga), pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). After we ship our products, there are no remaining obligations or customer

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acceptance requirements that would preclude revenue recognition. Our products are typically sold pursuant to a purchase order placed by our customers, and our terms and conditions of sale do not require customer acceptance. We recognize revenue upon shipment and transfer of title of products to our customers, which is either upon shipment from our dock, receipt at the customer's dock, or removal from consignment inventory at the customer's location, provided that we have received a valid purchase order, the price is fixed or determinable, title and risk of ownership have transferred, collection of resulting receivables is probable, and product returns are reasonably estimable. We do not provide training, installation or commissioning services.

We provide for future returns based on historical experience, current economic trends and changes in customer demand at the time revenue is recognized.

Accounts Receivable, Allowance for Doubtful Accounts and Allowance for sales returns

We periodically review the likelihood of collection on our accounts receivable balances and provide an allowance for doubtful accounts receivable primarily based upon the age of these accounts. We evaluate receivables from U.S. customers with an emphasis on balances in excess of 90 days and for receivables from customers located outside the U.S. with an emphasis on balances in excess of 120 days and establish a reserve on the receivable balances if needed. The reason for the difference in the evaluation of receivables between foreign and U.S. customers is that U.S. customers have historically made payments in a shorter period of time than foreign customers. Foreign business practices generally require us to allow customer payment terms that are longer than those accepted in the United States. We assess the probability of collection based on a number of factors, including the length of time a receivable balance has been outstanding, our past history with the customer and their creditworthiness.

As of December 31, 2015 and 2014, our accounts receivable, net balance was $18.5 million and $17.9 million, respectively, which was net of an allowance for doubtful accounts of $561,000 and $410,000, respectively. During 2015, we increased this allowance for doubtful accounts by $151,000 primarily because of the poor financial condition of a few customers. During 2014, we decreased this allowance for doubtful accounts by $459,000 primarily because of improved collections from customers. No amounts have been written off. If actual uncollectible accounts differ substantially from our estimates, revisions to the estimated allowance for doubtful accounts would be required, which could have a material impact on our financial results for future periods.

The allowance for sales returns is also deducted from gross accounts receivable. During 2015, we utilized $423,000 and charged an additional $434,000 resulting in the ending balance of allowance for sales returns of $424,000 as of December 31, 2015. During 2014, we utilized $410,000 and charged an additional $183,000 resulting in the allowance for sales returns of $413,000 as of December 31, 2014.

Warranty Reserve

We maintain a warranty reserve based upon our claims experience during the prior twelve months and any pending claims and returns of which we are aware. Warranty costs are accrued at the time revenue is recognized. As of December 31, 2015 and 2014, accrued product warranties totaled $497,000 and $802,000, respectively. The decrease in accrued product warranties is primarily attributable to decreased claims for quality issues experienced by some customers and reduction in estimated replacement costs. If actual warranty costs or pending new claims differ substantially from our estimates, revisions to the estimated warranty liability would be required, which could have a material impact on our financial condition and results of operations for future periods.

Inventory Valuation

Inventories are stated at the lower of cost or market. Cost is determined using the weighted average cost method. Our inventory consists of raw materials as well as finished goods and work-in-process that include material, labor and manufacturing overhead costs. Given the nature of our substrate products, and the materials used in the manufacturing process, the wafers and ingots comprising work-in-process may be held in inventory for up to two years and three years, respectively, as the risk of obsolescence for these materials is low. We routinely evaluate the levels of our inventory in light of current market conditions in order to identify excess and obsolete inventory, and we provide a

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valuation allowance for certain inventories based upon the age and quality of the product and the projections for sale of the completed products. As of December 31, 2015 and 2014, we had an inventory reserve of $12.0 million and $11.2 million, respectively, for excess and obsolete inventory. If actual demand for our products were to be substantially lower than estimated, additional inventory adjustments for excess or obsolete inventory might be required, which could have a material impact on our business, financial condition and results of operations.

Impairment of Investments

We classify marketable investments in debt and equity securities as available-for-sale securities in accordance with ASC topic 320, Investments—Debt and Equity Securities ("ASC 320"). All available-for-sale securities with a quoted market value below cost (or adjusted cost) are reviewed in order to determine whether the decline is other-than-temporary. Factors considered in determining whether a loss is temporary include the magnitude of the decline in market value, the length of time the market value has been below cost (or adjusted cost), credit quality, and our ability and intent to hold the securities for a period of time sufficient to allow for any anticipated recovery in market value.

We also invest in equity instruments of privately-held companies in China for business and strategic purposes. Investments in our non-consolidated joint venture companies are classified as other assets and accounted for under either the equity or cost method, depending on whether we have the ability to exercise significant influence over their operations or financial decisions. We monitor our investments for impairment and record reductions in carrying value when events or changes in circumstances indicate that the carrying value may not be recoverable. Determination of impairment is highly subjective and is based on a number of factors, including an assessment of the strength of investee's management, the length of time and extent to which the fair value has been less than our cost basis, the financial condition and near-term prospects of the investee, fundamental changes to the business prospects of the investee, share prices of subsequent offerings, and our intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in our carrying value. We had no write downs in 2015, 2014 and 2013.

Fair Value of Investments

ASC topic 820, Fair Value Measurement ("ASC 820") establishes three levels of inputs that may be used to measure fair value.

Level 1 instruments represent quoted prices in active markets. Therefore, determining fair value for Level 1 instruments does not require significant management judgment, and the estimation is not difficult.

Level 2 instruments include observable inputs other than Level 1 prices, such as quoted prices for comparable instruments in markets with insufficient volume or infrequent transactions (less active markets), issuer credit ratings, non-binding market consensus prices that can be corroborated with observable market data, model-derived valuations in which all significant inputs are observable or can be derived principally from or corroborated with observable market data for substantially the full term of the assets or liabilities, or quoted prices for similar assets or liabilities. These Level 2 instruments require more management judgment and subjectivity compared to Level 1 instruments, including:

- Determining which instruments are most comparable to the instrument being priced requires management to identify a sample of similar securities based on the coupon rates, maturity, issuer, credit rating, and instrument type, and subjectively select an individual security or multiple securities that are deemed most similar to the security being priced.
- Determining which model-derived valuations to use in determining fair value requires management judgment. When observable market prices for identical securities or similar securities are not available, we price our marketable debt

instruments using non-binding market consensus prices that are corroborated with observable market data or pricing models, such as discounted cash flow models, with all significant inputs derived from or corroborated with observable market data.

Level 3 instruments include unobservable inputs to the valuation methodology that are significant to the measurement of fair value of assets or liabilities. The determination of fair value for Level 3 instruments requires the

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most management judgment and subjectivity. We place short-term foreign currency hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these foreign currency hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted in "accrued liabilities" on the consolidated balance sheet and classified as Level 3 assets and liabilities. As of December 31, 2015 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

Impairment of Long-Lived Assets

We evaluate the recoverability of property, equipment and intangible assets in accordance with ASC topic 360, Property, Plant and Equipment ("ASC 360"). When events and circumstances indicate that long-lived assets may be impaired, we compare the carrying value of the long-lived assets to the projection of future undiscounted cash flows attributable to such assets. In the event that the carrying value exceeds the future undiscounted cash flows, we record an impairment charge against income equal to the excess of the carrying value over the asset's fair value. Fair values are determined based on quoted market values, discounted cash flows or internal and external appraisals, as applicable. Assets held for sale are carried at the lower of carrying value or estimated net realizable value. We had no "Assets held for sale" on the consolidated balance sheet as of December 31, 2015 and 2014.

Stock-Based Compensation

We account for stock-based compensation in accordance with ASC topic 718, Stock-based Compensation ("ASC 718"). Share-based awards granted include stock options and restricted stock awards. We utilize the Black Scholes option pricing model to estimate the grant date fair value of stock options, which requires the input of highly subjective assumptions, including estimating stock price volatility and expected term. Historical volatility of our stock price was used while the expected term for our options was estimated based on historical option exercise behavior and post-vesting forfeitures of options, and the contractual term, the vesting period and the expected term of the outstanding options. Further, we apply an expected forfeiture rate in determining the amount of share-based compensation. We use historical forfeitures to estimate the rate of future forfeitures. Changes in these inputs and assumptions can materially affect the measure of estimated fair value of our stock compensation. The cost of restricted stock awards is determined using the fair value of our common stock on the date of grant.

We recognize the compensation costs net of an estimated forfeiture rate over the requisite service period of the options award, which is generally the vesting term of four years. Compensation expense for restricted stock awards is recognized over the vesting period, which is generally three years or four years. Stock-based compensation expense is recorded in cost of revenue, research and development, and selling, general and administrative expenses. (see Note 1—Summary of Significant Accounting Policies—Stock Based Compensation).

Income Taxes

We account for income taxes in accordance with ASC topic 740, Income Taxes ("ASC 740") which requires that deferred tax assets and liabilities be recognized using enacted tax rates for the effect of temporary differences between the book and tax bases of recorded assets and liabilities. ASC 740 also requires that deferred tax assets be reduced by a valuation allowance if it is more likely than not that a portion of the deferred tax asset will not be realized.

We provide for income taxes based upon the geographic composition of worldwide earnings and tax regulations governing each region, particularly China. The calculation of tax liabilities involves significant judgment in estimating the impact of uncertainties in the application of complex tax laws, particularly in foreign countries such as China.

See Note 13—”Income Taxes” in the consolidated financial statements for additional information.

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Results of Operations

Overview

We were founded in 1986 to commercialize and enhance our proprietary vertical gradient freeze (VGF) technology for producing high-performance compound semiconductor substrates or wafers. We have one operating segment: our substrate business and the sale of raw materials used to make such substrates or other related products. We recorded our first substrate sales in 1990 and our substrate products currently include indium phosphide (InP), gallium arsenide (GaAs) and germanium (Ge) substrates used to produce semiconductor devices for use in applications such as fiber optic and wireless telecommunications, light emitting diodes (LEDs), lasers and for solar cells for space and terrestrial photovoltaic applications. We also sell raw materials, including gallium and germanium, through our participation in majority and minority owned subsidiaries and joint ventures.

Operating Results

We manufacture all of our products in the People's Republic of China (PRC or China), which generally has favorable costs for facilities and labor compared to the costs of comparable facilities and labor in the United States, Japan or Europe. Our supply chain includes AXT subsidiaries and joint venture companies in China, which provide us with reliable supply and enhanced sourcing lead-times for key raw materials, which are central to our final manufactured products.

We have experienced declining annual revenue in recent years, primarily as a result of silicon chips replacing GaAs chips in the mobile phone switching function. Prior to certain recent innovations, silicon chips did not perform adequately in this function due to power consumption, heat and speed issues. The development of the silicon-on-insulator technique overcame these deficiencies and provided a lower cost solution for mobile phone switches beginning in 2011. The decline in GaAs revenue is partially mitigated by revenue growth in our InP wafers. InP revenue has experienced over 50% year-on-year revenue growth in the last two years. We believe our product and customer diversity also mitigates the decline in GaAs revenue.

In the first quarter of 2014, we reduced our work force by approximately 11% and embarked on a number of additional cost reduction programs, primarily in our manufacturing group, which has the highest costs as compared to research and development or selling and administrative expenses. In 2015, we invested in wafer manufacturing equipment that will increase automation and decrease the number of manually operated processing steps in our production flow. We believe this can improve our manufacturing yields, product quality and product consistency. We will continue to focus on our InP products as we believe this product line can continue to be an engine for growth and better gross margins.

Revenue

	Years Ended Dec. 31			2014 to 2015 Increase		2013 to 2014 Increase	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
Total revenue	$ 77,502	$ 83,499	$ 85,335	$ (5,997)	(7.2) %	$ (1,836)	(2.2) %

Revenue decreased $6.0 million, or 7.2%, to $77.5 million in 2015 from $83.5 million in 2014. The revenue decrease resulted from a decrease in sales of our GaAs substrate materials, particularly from GaAs wafers used to produce LEDs. The LED market encountered severe pricing pressure and we withdrew from the lower performance segment of the LED market, resulting in lower sales of GaAs wafers. In addition raw material sales decreased due to a reduction of the average selling price of gallium. Ge substrate sales decreased as a result of a slowdown in the satellite solar cell market. This decrease in revenue was partially offset by the increased demand for our InP substrates as a result of expanding applications in the marketplace, such as fiber optic lasers and data connectivity.

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Revenue decreased $1.8 million, or 2.2%, to $83.5 million in 2014 from $85.3 million in 2013. The revenue decrease resulted from decreased demand for our substrate materials, particularly for our Ge substrates which in 2013 were stronger than 2014 because of a Concentrated Photovoltaic (CPV) solar installation in South Africa. The decline in sales of Ge substrates was partially offset by an increase in 2014 in sales of InP substrates and in sales of raw materials. GaAs revenue decreased in 2014 by a modest amount, in the low single digits.

Revenue by Geographic Region

	Year Ended Dec. 31,			2014 to 2015 Increase		2013 to 2014 Increase	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
	($ in thousands)						
Europe (primarily Germany)	$ 19,518	$ 21,535	21,387	$ (2,017)	(9.4) %	$ 148	0.7 %
% of total revenue	25 %	26 %	25 %				
Taiwan	13,799	$ 11,464	10,131	2,335	20.4 %	1,333	13.2 %
% of total revenue	18 %	14 %	12 %				
China	13,728	$ 17,451	24,946	(3,723)	(21.3) %	(7,495)	(30.0) %
% of total revenue	18 %	21 %	29 %				
Asia Pacific (excluding China, Taiwan and Japan)	11,482	$ 11,207	9,165	275	2.5 %	2,042	22.3 %
% of total revenue	15 %	13 %	11 %				
North America (primarily the United States)	9,837	$ 10,292	10,665	(455)	(4.4) %	(373)	(3.5) %
% of total revenue	13 %	12 %	12 %				
Japan	9,138	$ 11,550	9,041	(2,412)	(20.9) %	2,509	27.8 %
% of total revenue	11 %	14 %	11 %				
Total revenue	$ 77,502	$ 83,499	$ 85,335	$ (5,997)	(7.2) %	$ (1,836)	(2.2) %

*Primarily the United States.

Sales to customers located outside of North America represented approximately 87%, 88% and 88% of our revenue during 2015, 2014 and 2013, respectively.

Revenue from customers in China decreased primarily due to decreased sales of our GaAs substrates for LED applications and raw materials. Revenue from Japan decreased primarily due to decreased sales of GaAs substrates when a certain epi customer terminated its GaAs epi processing. In addition, the Japanese yen further weakened against the dollar in 2015. Revenue from customers in Europe decreased primarily due to decreased sales of

our Ge substrates in solar cells and optical sensors applications. Revenue increased in Taiwan primarily due to increased sales of InP. Our decrease in revenue was partially offset by the increased demand for our InP substrates in all regions as a result of expanding applications in the marketplace, such as fiber optic lasers and data connectivity.

We increased our sales in Japan, Taiwan and Asia Pacific in 2014 by $2.5 million, $1.3 million and $2.0 million respectively. Increases in Japan resulted from a strategic focus of our selling and business development efforts initiated late in 2013. This strategic focus delivered modest benefits the first half of 2014 and more substantial benefits in second half of 2014. Increases in Taiwan and Asia Pacific resulted from generally a more active market for our products with existing customers and the addition of a sales professional assigned to these regions. Further, we assigned additional resources for technical support to assist our customers in characterizing the products we delivered. In 2014 revenue from customers in China decreased substantially primarily due to decreased substrate revenue and raw material revenue. In 2014 revenue in North America and Europe was generally unchanged over 2013.

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Gross Margin

	Year Ended Dec. 31,			2014 to 2015 Increase		2013 to 2014	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
	($ in thousands)						
Gross profit	$ 16,829	$ 17,167	$ 11,828	$ (338)	(2.0) %	$ 5,339	45.1 %
Gross Margin %	21.7 %	20.6 %	13.9 %				

Gross margin increased to 21.7% of total revenue in 2015 from 20.6% of total revenue in 2014. Gross margin increased primarily due to a change in product mix, lower material costs and the continuation of a company-wide cost-saving campaign, which was first implemented in 2014. The 2015 quarterly gross margins for the first quarter to the fourth quarter were 23.7%, 20.9%, 25.1% and 17.1%, respectively. In the fourth quarter of 2015 our gross margin declined from the previous quarter as a result of a lower-of-cost-or-market inventory write down at one of our consolidated subsidiaries due to a decline of the market price of gallium.

Gross margin increased to 20.6% of total revenue in 2014 from 13.9% of total revenue in 2013. Gross margin increased primarily due to product mix and the implementation of cost-saving activities during 2014. The 2014 quarterly gross margins for the first quarter to the fourth quarter were 14.1%, 19.4%, 23.0% and 25.4%, respectively.

Selling, General and Administrative Expenses

	Years Ended Dec. 31			2014 to 2015 Increase		2013 to 2014 Increase	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
	($ in thousands)						
Selling, general and administrative expenses	$ 16,064	$ 14,970	$ 16,066	$ 1,094	7.3 %	$ (1,096)	(6.8) %
% of total revenue	20.7 %	17.9 %	18.8 %				

Selling, general and administrative expenses increased $1.1 million, or 7.3%, to $16.1 million for 2015 compared to $15.0 million for 2014. The increase in 2015 primarily resulted from an increase in professional services of $0.7 million related to an investigation of certain potential related-party transactions, which was completed in the second quarter of 2015, an increase in consulting services and higher stock-based compensation expenses. The increase was partially offset by lower personnel related costs and lower facilities maintenance cost resulting from the implementation of cost-saving activities.

Selling, general and administrative expenses decreased $1.1 million to $15.0 million for 2014 compared to $16.1 million for 2013. This decrease in 2014 primarily resulted from the implementation of cost-saving activities and a decrease in bad debt expense. These items were partially offset by an increase in professional services of $613,000 related to an investigation of certain potential related-party transactions, and higher personnel related costs.

Research and Development Expenses

	Years Ended Dec. 31			2014 to 2015 Increase		2013 to 2014 Increase	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
	($ in thousands)						
Research and development	$ 5,664	$ 4,144	$ 3,424	$ 1,520	36.7 %	$ 720	21.0 %
% of total revenue	7.3 %	5.0 %	4.0 %				

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Research and development expenses increased $1.5 million, or 36.7%, to $5.7 million for 2015 from $4.1 million for 2014. Research and development expenses increased primarily due to higher product development and testing costs and personnel related costs, partially offset by lower consulting expenses for product testing.

Research and development expenses increased $720,000, or 21.0%, to $4.1 million for 2014 from $3.4 million for 2013. Research and development expenses increased primarily due to higher product development and testing costs and personnel related costs, partially offset by lower consulting expenses for product testing.

Restructuring Charges

In the first quarter of 2014, we reduced the workforce at Tongmei by approximately 93 positions that are no longer required to support production and operations, or approximately 11 percent of the workforce. We recorded a restructuring charge of approximately $907,000 related to the reduction in force for severance-related expenses. This restructuring plan and reduction in force has been completed as of March 31, 2014. We had no restructuring charges in 2015.

Interest Income, Net

	Years Ended Dec. 31			2014 to 2015 Increase (Decrease)	% Change	2013 to 2014 Increase (Decrease)	% Change
	2015	2014	2013				
	($ in thousands)						
Interest income, net	$ 412	$ 483	$ 408	$ (71)	(14.7) %	$ 75	18.4 %
% of total revenue	0.5 %	0.6 %	0.5 %				

Interest income, net decreased $71,000 to $412,000 for 2015 from $483,000 for 2014. The decrease was primarily due to lower returns from our mix of investment securities held due to lower market interest rates.

Interest income, net increased $75,000 to $483,000 for 2014 from $408,000 for 2013 primarily due to higher interest income earned by one of our subsidiaries from their bank deposits.

Equity in Earnings of Unconsolidated Joint Venture Companies

	Years Ended Dec. 31			2014 to 2015 Increase (Decrease)	% Change	2013 to 2014 Increase (Decrease)	% Change
	2015	2014	2013				
	($ in thousands)						
Equity in earnings of unconsolidated joint ventures	$ 462	$ 1,528	$ 1,377	$ (1,066)	(69.8) %	$ 151	11.0 %
% of total revenue	0.6 %	1.8 %	1.6 %				

Equity in earnings of unconsolidated joint ventures is primarily net income from our seven minority-owned joint ventures that are not consolidated. Equity in earnings of unconsolidated joint ventures decreased $1.1 million to $462,000 for 2015 from $1.5 million for 2014 primarily due to lower net income from declining average selling prices and selling volume in the raw materials businesses.

Equity in earnings of unconsolidated joint ventures increased $151,000 to $1.5 million for 2014 from $1.4 million for 2013 primarily due to higher net income from improved performance of our minority-owned joint ventures that are not consolidated.

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Other Income (Expense), Net

	Years Ended Dec. 31			2014 to 2015 Increase		2013 to 2014 Increase	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
	($ in thousands)						
Other income (expense), net	$ 2,023	$ 361	$ (748)	$ 1,662	460.4 %	$ 1,109	(148.3) %
% of total revenue	2.6 %	0.4 %	(0.9) %				

Other income, net increased $1.7 million to $2.0 million for 2015 from $361,000 for 2014 primarily due to a foreign exchange gain of $717,000 in 2015 as compared to a foreign exchange loss of $1.0 million in 2014 and from manufacturing subsidies received from several government agencies in China. These items were offset by a lower gain recognized from the sales of common stock of Intelligent Epitaxy Technology, Inc (“IntelliEpi”), a Taiwan publicly traded company in 2015 in which we recognized $859,000 gain as compared to 2014 in which we recognize $1.3 million gain.

Other income, net increased $1.1 million to a profit of $361,000 for 2014 from net expense of $748,000 for 2013 primarily due to a larger gain recognized from the sale of IntelliEpi common stock in 2014, lower withholding tax on foreign dividends from our consolidated joint ventures and lower foreign exchange losses in 2014.

Provision for Income Taxes

	Years Ended Dec. 31			2014 to 2015 Increase		2013 to 2014 Increase	
	2015	2014	2013	(Decrease)	% Change	(Decrease)	% Change
	($ in thousands)						
Provision for income taxes	$ 531	$ 215	$ 188	$ 316	147.0 %	$ 27	14.4 %
% of total revenue	0.7 %	0.3 %	0.2 %				

Provision for income taxes for 2015 was $531,000, which was mostly related to our China subsidiary and our China joint venture operations. No income taxes or benefits have been provided for U.S. operations due to the loss in the U.S. and the uncertainty of generating future profit in the U.S. which has resulted in our deferred tax asset being fully reserved. Our estimated tax rate can vary greatly from year to year because of the change or benefit in the mix of taxable income between our U.S. and China based operations.

Provision for income taxes for 2014 was $215,000, which was mostly related to our China subsidiary and our China joint venture operations. The slight increase in provision for income taxes from 2013 to 2014 was primarily due to higher taxable income for state tax purposes in the U.S. Besides the state tax liabilities, no income taxes or benefit have been provided for U.S. operations due to the loss in the U.S. and the uncertainty of generating future profit in the U.S. which has resulted in our deferred tax asset being fully reserved.

Due to our uncertainty regarding our future profitability, we recorded a full valuation allowance against our net deferred tax assets of $66 million in 2015, $62 million in 2014 and $58 million in 2013.

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Noncontrolling Interests

	Years Ended Dec. 31			2014 to 2015 Increase (Decrease)	% Change	2013 to 2014 Increase (Decrease)	% Change
	2015	2014	2013				
	($ in thousands)						
Noncontrolling interests	$ (305)	$ 691	$ 1,145	$ (996)	(144.1) %	$ (454)	(39.7) %
% of total revenue	(0.4) %	0.8 %	1.3 %				

Noncontrolling interest in (losses) earnings of consolidated joint ventures for the years ended December 31, 2015, 2014 and 2013 were $(305,000), $691,000 and $1.1 million, respectively. The downward trend in noncontrolling interest's share of earnings from 2013 to 2015 and eventual switch to a share of losses from in 2015 was due to lower profitability from our China joint venture operations as profits from sales of raw materials have decreased due to declining average selling prices, which also led to a write down in inventory at one of the consolidated joint ventures.

Liquidity and Capital Resources

	Year Ended December 31,		
	2015	2014	2013
	($ in thousands)		
Net cash provided by (used in):			
Operating activities	$ 1,878	$ 3,497	$ 2,992
Investing activities	(2,483)	469	(6,695)
Financing activities	(2,234)	(32)	(2,513)
Effect of exchange rate changes	(1,100)	(81)	543
Net change in cash and cash equivalents	(3,939)	3,853	(5,673)
Cash and cash equivalents—beginning year	28,814	24,961	30,634
Cash and cash equivalents—end of year	24,875	28,814	24,961
Short and long-term investments—end of year	19,128	20,123	22,644
Total cash, cash equivalents and short-term and long-term investments	$ 44,003	$ 48,937	$ 47,605

We consider cash and cash equivalents, short-term investments and long-term investments as liquid and available for use within two years in our current operations. Short-term investments and long-term investments are comprised of U.S. government securities and investment-grade corporate notes and bonds. Also included in short-term investments is our investment in common stock of IntelliEpi and GCS Holdings, Inc. ("GHI"). In 2013, we re-categorized our IntelliEpi investment from the cost method to short-term investments as IntelliEpi completed its initial public offering in 2013. In 2015, we re-categorized our GHI investment from the cost method to short-term investments when we determined that there was sufficient trading volume in the exchange for the stock to be determined readily marketable.

As of December 31, 2015, our principal source of liquidity was $44.0 million, which consisted of cash and cash equivalents of $24.9 million, short-term investments of $11.4 million and long-term investments of $7.7 million. In 2015, cash and cash equivalents decreased by $3.9 million and short-term and long-term investments decreased by $1.0 million. The decrease in cash and cash equivalents of $3.9 million in 2015 was primarily due to net cash used in investing activities of $2.5 million, net cash used in financing activities of $2.2 million, the effect of exchange rate

changes of $1.1 million, and was partially offset by net cash provided by operating activities of $1.9 million. As of December 31, 2015, we and our consolidated joint ventures held approximately $22.3 million in cash and investments in foreign bank accounts. This consists of $16.8 million held by our wholly owned subsidiary in China and $5.5 million held by our three partially-owned consolidated subsidiaries in China. Of this $22.3 million, approximately $15.9 million would not be available for use in the United States without paying United States income taxes. We believe that the current value of our net operating loss carry forward would offset the taxes due.

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As of December 31, 2014, our principal sources of liquidity were $48.9 million, an increase of $1.3 million from $47.6 million as of December 31, 2013. This $48.9 million consisted of cash and cash equivalents of $28.8 million, short-term investments of $12.3 million and long-term investments of $7.8 million. In 2014 cash and cash equivalents increased $3.8 million. Short and long-term investments decreased by $2.5 million to $20.1 million from $22.6 million. The increase in cash and cash equivalents was primarily due to net cash provided by operating activities of $3.5 million and by net cash provided by investing activities of $469,000, offset by net cash used in financing activities of $32,000 and the effect of exchange rate changes of $81,000. As of December 31, 2014, we and our consolidated joint ventures held approximately $18.3 million in cash and investments in foreign bank accounts. This consists of $10.2 million held by our wholly owned subsidiary in China and $8.1 million held by our three partially owned consolidated subsidiaries in China. Of this $18.3 million, approximately $13.9 million is not available for use in the United States without paying United States income taxes.

Net cash provided by operating activities of $1.9 million for 2015 was primarily comprised of an adjustment of non-cash items of depreciation of $5.5 million, amortization of marketable securities premium of $218,000, stock-based compensation of $1.3 million, provision for doubtful accounts of $211,000, loss on disposal property and equipment of $17,000 offset by our net loss of $2.5 million, realized gain on sales of investments of $859,000, gain on equity investments of $462,000 and a net change of $1.6 million in assets and liabilities. The $1.6 million net change in operating assets and liabilities primarily resulted from a $1.4 million decrease in prepaid expenses and other current assets, a $542,000 decrease in other assets, offset by a $1.1 million increase in accounts receivable, a $1.1 million decrease in accrued liabilities, an $813,000 decrease in other long-term liabilities, and a $485,000 decrease in accounts payable.

Net cash provided by operating activities of $3.5 million for 2014 was primarily comprised of our net loss of $697,000, adjusted for non-cash items of depreciation and amortization of $5.6 million, stock based compensation of $1.1 million, provision for doubtful accounts of $9,000, amortization of marketable securities premium of $432,000, offset by gain on sales of investment of $1.3 million, a gain on disposal of property, plant and equipment of $13,000 and a net change of $211,000 in operating assets and liabilities. The $211,000 net change in operating assets and liabilities primarily resulted from a $479,000 decrease in inventories, a $2.4 million decrease in prepaid expenses and other current assets, a $946,000 decrease in other assets, offset by a $3.0 million increase in accounts receivable, a $979,000 decrease in accounts payable, a $742,000 increase in accrued liabilities and a $833,000 decrease in other long-term liabilities.

Net cash provided by operating activities of $3.0 million for 2013 was primarily comprised of our net loss of $6.8 million, adjusted for non-cash items of depreciation and amortization of $5.5 million, stock based compensation of $1.3 million, provision for doubtful accounts of $869,000, amortization of marketable securities premium of $518,000, offset by gain on sale of cost method investment of $811,000, a gain on disposal of property, plant and equipment of $9,000 and a net change of $3.9 million in operating assets and liabilities. The $3.9 million net change in operating assets and liabilities primarily resulted from a $1.4 million decrease in inventories, a $645,000 increase in prepaid expenses and other current assets, a $2.2 million decrease in accounts receivable, a $2.2 million increase in accounts payable, a $899,000 decrease in accrued liabilities and a $373,000 decrease in other long-term liabilities.

Net cash used in investing activities of $2.5 million for 2015 was primarily from the purchases of marketable investment securities of $12.8 million and the purchase of property, plant and equipment of $4.2 million and investment in non-marketable equity investments of $162,000, partially offset by proceeds from maturities and sales of available-for-sales securities of $14.3 million and dividends received from equity method investments of $305,000.

Net cash provided by investing activities of $469,000 for 2014 was primarily from the sale of investments totaling $13.9 million offset by the purchase of investments totaling $11.8 million and the purchase of property, plant and equipment of $2.0 million.

Net cash used in investing activities of $6.7 million for 2013 was primarily from the purchase of property, plant and equipment of $5.4 million mainly for our China facilities and the purchase of investments totaling $14.1 million offset by the sale of investments totaling $12.5 million.

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Net cash used in financing activities was $2.2 million for 2015, which consisted of $2.3 million for the repurchase of the Company's common stock, including commission and fees, and $112,000 net dividends paid by our joint ventures, partially offset by net proceeds of $165,000 on the issuance of common stock pursuant to stock option exercises.

Net cash used in financing activities was $32,000 for 2014, which consisted of $166,000 net dividends paid by our consolidated joint ventures, partially offset by net proceeds of $134,000 on the issuance of common stock pursuant to stock option exercises.

Net cash used in financing activities was $2.5 million for 2013, which consisted of $2.3 million net dividends paid by our consolidated joint ventures and $716,000 of repurchases of shares of our common stock, partially offset by net proceeds of $532,000 on the issuance of common stock pursuant to stock option exercises.

On February 21, 2013, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $6.0 million of our outstanding common stock through February 27, 2014. These purchases can be made from time to time in the open market and are funded from our existing cash balances and cash generated from operations. During 2013, we repurchased approximately 285,000 shares at an average price of $2.51 per share for a total purchase price of $716,000 under the stock repurchase program. As of December 31, 2013, approximately $5.3 million remained available for future repurchases under this program. No shares were repurchased in 2014 under this program and the plan expired on February 27, 2014.

On October 27, 2014, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $5.0 million of our outstanding common stock. These repurchases can be made from time to time in the open market and are funded from our existing cash balances and cash generated from operations. During 2015, we repurchased approximately 908,000 shares at an average price of $2.52 per share for a total purchase price of approximately $2.3 million under the stock repurchase program. As of December 31, 2015, approximately $2.7 million remained available for future repurchases under this program. See Item 5, Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities in Part II.

We believe that we have adequate cash and investments to meet our needs over the next twelve months. If our sales decrease, however, our ability to generate cash from operations will be adversely affected which could adversely affect our future liquidity, require us to use cash at a more rapid rate than expected, and require us to seek additional capital. There can be no assurance that such additional capital will be available or, if available it will be on terms acceptable to us.

Cash from operations could be affected by various risks and uncertainties, including, but not limited to those set forth below under Item 1A. "Risk Factors" above.

Line of Credit

Prior to 2015, we had an unused credit facility with a bank that provided for a line of credit of $10.0 million. The line of credit was secured by marketable securities we had with the bank at that time. This line of credit was never used and there were no outstanding borrowings under this line of credit as of September 30, 2015 and December 31, 2014. This line of credit was terminated in January 2015 when we closed our investment account with this institution and moved all of our funds from this bank to a different bank.

Off-Balance Sheet Arrangements

We did not have any off-balance sheet financing arrangements and have never established any special purpose entities as defined under SEC Regulation S-K Item 303(a)(4)(ii). We have not entered into any options on non-financial assets.

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Contractual Obligations

We lease certain office space, warehouse facilities and equipment under long-term operating leases expiring at various dates through December 2025. The majority of our lease obligations relates to our lease agreement for the facility in Fremont, California with approximately 19,467 square feet. Total rent expenses under these operating leases were approximately $313,000, $260,000 and $638,000 for the years ended December 31, 2015, 2014 and 2013, respectively.

We entered into a royalty agreement with a competitor effective December 3, 2010 with a term of eight years, terminating December 31, 2018. We and our related companies are granted a worldwide, nonexclusive, royalty bearing, irrevocable license to certain patents for the term of the agreement. We shall pay up to $7.0 million as a royalty payment over eight years that began in 2011, based on future royalty bearing sales. The royalty agreement contains a clause that allows us to claim a credit, starting in 2013, in the event that the royalty bearing sales for the year are lower than a pre-determined amount set forth in the agreement. Royalty expense under the agreement was $583,000, which was net of claim for credit of $217,000 for the year ended December 31, 2015. Royalty expense for the years ended December 31, 2014 and 2013 were $577,000, which was net of claim for credit of $223,000, and $530,000, which was net of claim for credit of $270,000, respectively.

The following table summarizes our contractual obligations as of December 31, 2015 (in thousands):

	Payments due by period				
Contractual Obligations	Total	Less than 1 year	1-3 years	4-5 years	More than 5 years
Operating leases	$ 533	$ 173	$ 206	$ 57	$ 97
Royalty agreement	1,725	575	1,150	—	—
Total	$ 2,258	$ 748	$ 1,356	$ 57	$ 97

Selected Quarterly Results of Operations

The following table sets forth unaudited quarterly results for the eight quarters ended December 31, 2015. The information for each of these quarters is unaudited but has been prepared on the same basis as the audited consolidated financial statements. We believe that all necessary adjustments, consisting only of normal recurring adjustments, have

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been included in the amounts stated below to present fairly such quarterly information. The operating results for any quarter are not necessarily indicative of results for any subsequent period.

	Quarters Ended							
(in thousands, except for per share amounts)	Dec. 31, 2015	Sept. 30, 2015	June. 30, 2015	Mar 31, 2015	Dec. 31, 2014	Sept. 30, 2014	June. 30, 2014	Mar 31, 2014
Revenue	$ 18,057	$ 18,371	$ 21,010	$ 20,064	$ 19,567	$ 23,138	$ 21,449	$ 19,345
Cost of revenue	14,967	13,766	16,625	15,315	14,596	17,820	17,289	16,627
Gross profit	3,090	4,605	4,385	4,749	4,971	5,318	4,160	2,718
Operating expenses:								
Selling, general and administrative	3,379	3,659	3,775	5,251	4,341	3,505	3,688	3,436
Research and development	1,377	1,657	1,389	1,241	1,222	1,160	987	775
Restructuring charge	—	—	—	—	—	—	—	907
Total operating expenses	4,756	5,316	5,164	6,492	5,563	4,665	4,675	5,118
Income (loss) from operations	(1,666)	(711)	(779)	(1,743)	(592)	653	(515)	(2,400)
Interest income, net	105	102	108	97	123	106	127	127
Equity in earnings (losses) of unconsolidated joint ventures	(315)	167	410	200	26	390	625	487
Other income (expense), net	268	496	626	633	111	(236)	476	10
Income (loss) before provision for income taxes	(1,608)	54	365	(813)	(332)	913	713	(1,776)
Provision for (benefit from) income taxes	197	7	241	86	(39)	43	152	59
Net income (loss)	(1,805)	47	124	(899)	(293)	870	561	(1,835)
Less: Net (income) loss attributable to noncontrolling interest	562	(5)	(127)	(125)	(18)	(226)	(242)	(205)
Net income (loss) attributable to AXT, Inc	$ (1,243)	$ 42	$ (3)	$ (1,024)	$ (311)	$ 644	$ 319	$ (2,040)
Net income (loss) attributable to AXT, Inc. per common share:								
Basic	$ (0.04)	$ (0.00)	$ (0.00)	$ (0.03)	$ (0.01)	$ 0.02	$ 0.01	$ (0.06)
Diluted	$ (0.04)	$ (0.00)	$ (0.00)	$ (0.03)	$ (0.01)	$ 0.02	$ 0.01	$ (0.06)
Weighted average number of common shares outstanding:								

Basic	31,951	31,988	32,242	32,553	32,558	32,504	32,381	32,364
Diluted	31,951	31,988	32,242	32,553	32,558	32,738	32,597	32,364

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Recent Accounting Pronouncements

Recent accounting pronouncements are detailed in Note 1 to our Consolidated Financial Statements included in this Annual Report on Form 10-K.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

Foreign Currency Risk

A significant portion of our business is conducted in currencies other than the U.S. dollar. Foreign exchange losses have had a material adverse effect on our operating results and cash flows in the past and could have a material adverse effect on our operating results and cash flows in the future. If we do not effectively manage the risks associated with this currency risk, our revenue, cash flows and financial condition could be adversely affected. During 2015, we recorded a foreign exchange gain of $717,000, included as part of other income (expense), net in our consolidated statements of operations. During 2014, we recorded net foreign exchange losses of $1.0 million, included as part of other income (expense), net in our consolidated statements of operations. In addition, we recorded unrealized foreign currency charges of $377,000 related to financial statement translations which are included in the balance of “accumulated other comprehensive income” on our consolidated balance sheets. We incurred foreign currency transaction exchange gains and losses due to operations in general. In the future we may experience foreign exchange losses on our non-functional currency denominated receivables and payables to the extent that we have not mitigated our exposure. Foreign exchange losses could have a materially adverse effect on our operating results and cash flows.

Our product sales to Japanese customers are typically invoiced in Japanese yen. As such we have foreign exchange exposure on our accounts receivable and on any Japanese yen denominated cash deposits. In 2014 and the first half of 2015, the Japanese yen depreciated against the dollar. The major portion of our 2014 exchange loss is attributable to the Japanese yen’s movement.

To partially protect us against fluctuations in foreign currency resulting from accounts receivable in Japanese yen, starting in 2015, we instituted a foreign currency hedging program. We place short term hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted on the consolidated balance sheet and classified as Level 3 assets and liabilities. As of December 31, 2015 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

The functional currency for our foreign operations is the Renminbi, the local currency of China, and in the future we may establish short term hedges covering Renminbi. Most of our operations are conducted in China and most of our costs are incurred in Chinese Renminbi, which subjects us to fluctuations in the exchange rates between the U.S. dollar and the Chinese Renminbi. We incur transaction gains or losses resulting from consolidation of expenses incurred in local currencies for our Chinese subsidiaries, including our joint ventures, as well as in translation of the assets and liabilities at each balance sheet date. Our financial results could be adversely affected by factors such as

changes in foreign currency exchange rates or weak economic conditions in foreign markets, including the revaluation by China of the Renminbi, and any future adjustments that China may make to its currency such as any move it might make to a managed float system with opportunistic interventions. We may also experience foreign exchange losses on our non-functional currency denominated receivables and payables.

We currently are using a hedging program to minimize the effects of currency fluctuations relating to the Japanese yen. While we may apply this program to other currencies, such as the Chinese Renminbi, our hedging position is partial and may not exist at all in the future. It may not succeed in minimizing our foreign currency fluctuation risks. Our primary objective in holding these instruments is to reduce the volatility of earnings and cash flows associated with changes in foreign currency. The program is not designated for trading or speculative purposes. The company may choose not to hedge certain foreign exchange exposures for a variety of reasons, including but not limited to accounting considerations and the prohibitive economic cost of hedging particular exposures.

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Interest Rate Risk

Cash and cash equivalents earning interest and certain variable rate debt instruments are subject to interest rate fluctuations. The following table sets forth the probable impact of a 10% change in interest rates (in thousands):

Instrument	Balance as of December 31, 2015	Current Interest Rate	Projected Annual Interest Income/(Expense)	Proforma 10% Interest Rate Decline Income/(Expense)	Proforma 10% Interest Rate Increase Income/(Expense)
Cash and cash equivalents	$ 24,875	0.85 %	$ 211	$ 190	$ 232
Investments in marketable debt	18,496	1.95 %	361	325	397
			$ 572	$ 515	$ 629

The primary objective of our investment activities is to preserve principal while maximizing income without significantly increasing risk. Financial instruments that potentially subject us to concentration of credit risk consist primarily of cash and cash equivalents, short-term investments, and trade accounts receivable. We invest primarily in money market accounts, certificates of deposits, corporate bonds and notes, and government securities. We are exposed to credit risks in the event of default by the issuers to the extent of the amount recorded on the consolidated balance sheets. These securities are generally classified as available-for-sale and consequently are recorded on the balance sheet at fair value with unrealized gains or losses reported as a separate component of accumulated other comprehensive income, net of estimated tax. Our cash, cash equivalents and short-term investments and long-term investments are in high-quality securities placed with major banks and financial institutions and commercial paper. We have no investments in auction rate securities.

Credit Risk

We perform ongoing credit evaluations of our customers' financial condition, and limit the amount of credit extended when deemed necessary, but generally do not require collateral. One customer accounted for over 10% of our accounts receivable balance as of December 31, 2015 while two customers each accounted for over 10% of our accounts receivable balance as of December 31, 2014.

Equity Risk

We maintain minority investments in privately-held companies located in China either invested directly by us and our wholly-own subsidiary or indirectly through our consolidated joint ventures. These minority investments are reviewed for other than temporary declines in value on a quarterly basis. These investments are classified as other assets in the consolidated balance sheets and accounted for under either the equity or cost method, depending on whether we have the ability to exercise significant influence over their operations or financial decisions. We monitor our investments for impairment and record reductions in carrying value when events or changes in circumstances indicate that the carrying value may not be recoverable. Reasons for other than temporary declines in value include whether the related company would have insufficient cash flow to operate for the next twelve months, significant changes in the operating performance and changes in market conditions. As of December 31, 2015 and 2014, our direct minority investments under the cost method totaled $0 and $200,000, respectively, our direct minority investments under the equity method totaled $7.9 million and $8.1 million, respectively, and our indirect minority investments by our

consolidated joint ventures totaled $4.1 million and $4.0 million, respectively.

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Item 8. Consolidated Financial Statements and Supplementary Data

The consolidated financial statements, related notes thereto and financial statement schedules required by this item are listed and set forth beginning on page 56, and are incorporated by reference here. Supplementary financial information regarding quarterly financial information required by this item is set forth under the caption "Selected Quarterly Results of Operations" in Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," and is incorporated by reference here.

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

None.

Item 9A. Controls and Procedures

Evaluation of disclosure controls and procedures.

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K. Based upon this evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures as defined under Exchange Act Rules 13a-15(e) and 15d-15(e) were effective at the reasonable assurance level to ensure that information required to be disclosed in our Securities Exchange Act reports is recorded, processed, summarized and reported within the time periods specified by the Securities and Exchange Commission and is accumulated and communicated to management, including our Chief Executive Officer and our Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Our disclosure controls and procedures include components of our internal control over financial reporting. Management's assessment of the effectiveness of our internal control over financial reporting is expressed at the level of reasonable assurance because a control system, no matter how well designed and operated, can provide only reasonable assurance that the control system's objectives will be met.

Management's report on internal control over financial reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Internal control over financial reporting is a process designed by, or under the supervision of, our Chief Executive Officer and Chief Financial Officer, and implemented by our Board of Directors, management and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States. Internal control over financial reporting includes those policies and procedures that:

- pertain to the maintenance of records that in reasonable detail accurately and fairly reflect our transactions and dispositions of our assets;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the consolidated financial statements.

Because of 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

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may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, has assessed the effectiveness of our internal control over financial reporting as of December 31, 2015 based on the criteria established in Internal Control—Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Management has concluded that our internal control over financial reporting was effective as of December 31, 2015.

Our independent registered public accounting firm, Burr Pilger Mayer, Inc. has audited the consolidated financial statements included in this Annual Report on Form 10-K and has issued its report on the effectiveness of our internal control over financial reporting as of December 31, 2015.

Changes in internal control over financial reporting.

There were no changes in our internal control over financial reporting that occurred during the year ended December 31, 2015 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of

AXT, Inc.

We have audited the internal control over financial reporting of AXT, Inc. and its subsidiaries' (the Company") as of December 31, 2015, based on the criteria established in Internal Control—Integrated Framework (2013 Framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). 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 conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether 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.

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.

In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2015, based on criteria established in Internal Control—Integrated Framework (2013 Framework) issued by the COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of AXT, Inc. and subsidiaries as of December 31, 2015 and 2014 and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2015 and our report dated March 11, 2016, expressed an unqualified opinion.

/s/ Burr Pilger Mayer, Inc.

San Jose, California

March 11, 2016

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PART III

The United States Securities and Exchange Commission ("SEC") allows us to include information required in this report by referring to other documents or reports we have already or will soon be filing. This is called "Incorporation by Reference." We intend to file our definitive proxy statement for our annual meeting of stockholders to be held on May 26, 2016 (the "Proxy Statement") pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this report, and certain information therein is incorporated in this report by reference.

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item with respect to identification of directors is incorporated by reference to the information contained in the section captioned "Information About our Board of Directors" in the Proxy Statement. The information with respect to our executive officers, is incorporated by reference to the information contained in the section captioned "Executive Officers" in the Proxy Statement. Information with respect to Items 405 of Regulation S-K is incorporated by reference to the information contained in the sections of the Proxy Statement captioned "Section 16(a) Beneficial Ownership Reporting Compliance." There will be no disclosure under Item 407(c)(3). Information with respect to Items 407(d)(4) and 407(d)(5) is incorporated by reference to the information contained in the sections of the Proxy Statement captioned "Corporate Governance—Committees of the Board of Directors."

The Board of Directors of AXT, Inc. has adopted a Code of Conduct and Ethics (the "Code") that applies to our principal executive officers, principal financial officer, and corporate controller, as well as other employees. A copy of this Code has been posted on our Internet website at www.axt.com. Any amendments to, or waivers from, a provision of our Code that applies to our principal executive officer, principal financial officer, controller, or persons performing similar functions and that relates to any element of the Code enumerated in paragraph (b) of Item 406 of Regulation S-K shall be disclosed by posting such information on our website.

Item 11. Executive Compensation

The information required by this Item is incorporated herein by reference to information set forth in our Proxy Statement under the section entitled "Executive Compensation and Other Matters."

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

The information required by this Item is incorporated herein by reference to information set forth in our Proxy Statement under the section entitled "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information."

Item 13. Certain Relationships and Related Transactions and Director Independence

Information required by this item will be set forth in our Proxy Statement under the headings "Compensation Committee Interlocks and Insider Participation" and "Certain Relationships and Related Transactions," which information is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required by this Item is incorporated herein by reference to information set forth in our Proxy Statement under the section entitled "Ratification of Appointment of Independent Registered Public Accountants."

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PART IV

Item 15. Exhibits and Financial Statement Schedules

(a)The following documents are filed as part of this report:

(1)Financial Statements:

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm, Burr Pilger Mayer, Inc.	55
Consolidated Balance Sheets	56
Consolidated Statements of Operations	57
Consolidated Statements of Comprehensive Loss	58
Consolidated Statements of Stockholders' Equity	59
Consolidated Statements of Cash Flows	60
Notes to Consolidated Financial Statements	61

(2)Financial Statement Schedules

All schedules have been omitted because the required information is not applicable or because the information required is included in the consolidated financial statements or notes thereto.

(b)Exhibits

See Index to Exhibits attached elsewhere to this Form 10-K. The exhibits listed in the accompanying Index to Exhibits are filed as part of, or incorporated by reference into, this report on Form 10-K.

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of

AXT, Inc.

We have audited the accompanying consolidated balance sheets of AXT, Inc. and its subsidiaries (the "Company") as of December 31, 2015 and 2014, and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2015. The Company's management is responsible for these consolidated financial statements. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of AXT, Inc. and its subsidiaries. as of December 31, 2015 and 2014, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2015, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the Company's internal control over financial reporting as of December 31, 2015, based on criteria established in Internal Control—Integrated Framework (2013 Framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), and our report dated March 11, 2016, expressed an unqualified opinion thereon.

/s/ Burr Pilger Mayer, Inc.

San Jose, California

March 11, 2016

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AXT, INC.

CONSOLIDATED BALANCE SHEETS

(In thousands, except per share data)

	December 31, 2015	2014
ASSETS		
Current assets		
Cash and cash equivalents	$ 24,875	$ 28,814
Short-term investments	11,437	12,340
Accounts receivable, net of allowances of $985 and $823 as of December 31, 2015 and 2014	18,468	17,864
Inventories	38,012	38,574
Related party notes receivable – current	—	171
Prepaid expenses and other current assets	4,096	5,430
Total current assets	96,888	103,193
Long-term investments	7,691	7,783
Property, plant and equipment, net	31,422	33,862
Related party notes receivable – long-term	1,781	1,704
Other assets	14,114	14,975
Total assets	$ 151,896	$ 161,517
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 6,460	$ 7,137
Accrued liabilities	6,381	7,634
Total current liabilities	12,841	14,771
Long-term portion of royalty payments	1,150	1,725
Other long-term liabilities	344	333
Total liabilities	14,335	16,829
Commitments and contingencies (Note 17)		
Stockholders' equity:		
Preferred stock Series A, $0.001 par value; 2,000 shares authorized; 883 shares issued and outstanding as of December 31, 2015 and 2014 (Liquidation preference of $6.5 million and $6.3 million as of December 31, 2015 and 2014.)	3,532	3,532
Common stock, $0.001 par value; 70,000 shares authorized; 32,548 and 32,837 shares issued and outstanding as of December 31, 2015 and 2014	32	32
Additional paid-in-capital	194,646	195,419
Accumulated deficit	(70,621)	(68,393)
Accumulated other comprehensive income	4,382	7,673
Total AXT, Inc. stockholders' equity	131,971	138,263
Noncontrolling interests	5,590	6,425
Total stockholders' equity	137,561	144,688
Total liabilities and stockholders' equity	$ 151,896	$ 161,517

See accompanying notes to consolidated financial statements.

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AXT, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except per share data)

	Year Ended December 31,		
	2015	2014	2013
Revenue	$ 77,502	$ 83,499	$ 85,335
Cost of revenue	60,673	66,332	73,507
Gross profit	16,829	17,167	11,828
Operating expenses:			
Selling, general, and administrative	16,064	14,970	16,066
Research and development	5,664	4,144	3,424
Restructuring charge	—	907	—
Total operating expenses	21,728	20,021	19,490
Loss from operations	(4,899)	(2,854)	(7,662)
Interest income, net	412	483	408
Equity in earnings of unconsolidated joint ventures	462	1,528	1,377
Other income (expense), net	2,023	361	(748)
Loss before provision for income taxes	(2,002)	(482)	(6,625)
Provision for income taxes	531	215	188
Net loss	(2,533)	(697)	(6,813)
Less: Net (income) loss attributable to noncontrolling interests	305	(691)	(1,145)
Net loss attributable to AXT, Inc.	$ (2,228)	$ (1,388)	$ (7,958)
Net loss attributable to AXT, Inc. per common share:			
Basic	$ (0.07)	$ (0.05)	$ (0.25)
Diluted	$ (0.07)	$ (0.05)	$ (0.25)
Weighted average number of common shares outstanding:			
Basic	32,183	32,452	32,700
Diluted	32,183	32,452	32,700

See accompanying notes to consolidated financial statements.

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AXT, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

(In thousands)

	Year Ended December 31,		
	2015	2014	2013
Net loss	$ (2,533)	$ (697)	$ (6,813)
Other comprehensive income (loss), net of tax:			
Change in foreign currency translation gain (loss), net of tax	(3,425)	(377)	1,568
Change in unrealized loss (gain) on available-for-sale investments, net of tax	(313)	(964)	1,682
Total other comprehensive income (loss), net of tax	(3,738)	(1,341)	3,250
Comprehensive loss	(6,271)	(2,038)	(3,563)
Less: Comprehensive (income) loss attributable to noncontrolling interests	752	(630)	(1,475)
Comprehensive loss attributable to AXT, Inc.	$ (5,519)	$ (2,668)	$ (5,038)

See accompanying notes to consolidated financial statements.

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AXT, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In thousands)

	Preferred Stock		Common Stock		Additional Paid-In		Other Comprehensive	AXT, Inc. Stockholders'		Total Stock
	Shares	$	Shares	$	Capital	Accumulated Deficit	Income	Equity	Noncontrolling Interests	Equit
y 1, 2013	883	$ 3,532	32,471	$ 32	$ 193,063	$ (59,047)	$ 6,033	$ 143,613	$ 7,301	$ 150
on stock exercised			331		532			532		532
on stock hased			(285)		(716)			(716)		(71
based nsation ce of on					1,277			1,277		1,2
n the form of ed stock come (loss) vidend d by joint es			88			(7,958)		(7,958)	1,145	(6,
									(2,898)	(2,
ehensive e							2,920	2,920	330	3,2
e as of ber 31, 2013	883	3,532	32,605	32	194,156	(67,005)	8,953	139,668	5,878	145
on stock exercised			111		134			134		134
on stock hased										
based nsation ce of on					1,129			1,129		1,1
n the form of ed stock come (loss) vidend d by joint es			121			(1,388)		(1,388)	691	(69
									(83)	(83
ehensive loss							(1,280)	(1,280)	(61)	(1,
	883	3,532	32,837	32	195,419	(68,393)	7,673	138,263	6,425	144

e as of										
ber 31, 2014										
on stock										
exercised			119		165			165		165
on stock										
ased			(908)		(2,287)			(2,287)		(2,2
ted stock										
canceled			(47)							
based										
nsation					1,349			1,349		1,3
e of										
on										
the form of										
ed stock			547							
s						(2,228)		(2,228)	(305)	(2,5
idend										
d by joint										
es									(83)	(83
hensive loss							(3,291)	(3,291)	(447)	(3,7
e as of										
ber 31, 2015	883	$ 3,532	32,548	$ 32	$ 194,646	$ (70,621)	$ 4,382	$ 131,971	$ 5,590	$ 137

See accompanying notes to consolidated financial statements.

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AXT, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)

	Year Ended December 31,		
	2015	2014	2013
Cash flows from operating activities:			
Net loss	$ (2,533)	$ (697)	$ (6,813)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation and amortization	5,494	5,639	5,470
Amortization of marketable securities premium	218	432	518
Stock-based compensation	1,349	1,129	1,277
Provision for doubtful accounts	211	9	869
Realized gain on sale of investments	(859)	(1,263)	—
Gain on sale of cost method investment	—	—	(811)
Loss (gain) on disposal of equipment	17	(13)	(9)
Income from equity method investments, net	(462)	(1,528)	(1,377)
Changes in operating assets and liabilities:			
Accounts receivable	(1,076)	(2,959)	2,160
Inventories	(45)	479	1,439
Prepaid expenses and other current assets	1,405	2,393	(645)
Other assets	542	946	1
Accounts payable	(485)	(979)	2,185
Accrued liabilities	* (1,085)	742	(899)
Other long-term liabilities	(813)	(833)	(373)
Net cash provided by operating activities	1,878	3,497	2,992
Cash flows from investing activities:			
Purchases of equipment	(4,150)	(1,971)	(5,424)
Proceeds from sale of equipment	2	13	—
Purchases of available for sale securities	(12,787)	(11,828)	(14,092)
Proceeds from sales and maturities of available for sale securities	14,309	13,928	12,486
Investments in non-marketable equity investments	(162)	—	(782)
Dividends received from equity method investments	305	327	299
Repayment of related party note receivable	—	—	818
Net cash provided by (used in) investing activities	(2,483)	469	(6,695)
Cash flows from financing activities:			
Proceeds from common stock options exercised	165	134	532
Repurchase of the Company’s common stock, including commission	(2,287)	—	(716)
Dividends paid by joint ventures to their minority share holders	(112)	(166)	(2,329)
Net cash used in financing activities	(2,234)	(32)	(2,513)
Effect of exchange rate changes on cash and cash equivalents	(1,100)	(81)	543
Net (decrease) increase in cash and cash equivalents	(3,939)	3,853	(5,673)
Cash and cash equivalents at the beginning of the year	28,814	24,961	30,634
Cash and cash equivalents at the end of the year	$ 24,875	$ 28,814	$ 24,961
Supplemental disclosures:			

Income taxes paid	$ 284	$ 293	$ 782

* Dividend accrued but not paid by joint ventures of $534, $563 and $651 was included in accrued liabilities as of December 31, 2015, 2014 and 2013, respectively

See accompanying notes to consolidated financial statements.

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AXT, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. The Company and Summary of Significant Accounting Policies

The Company

AXT, Inc. and its subsidiaries (“we, “the Company”, or “AXT”) is a developer and producer of high-performance compound and single element semiconductor substrates, also known as wafers. The dominant substrates used in producing semiconductor chips are made from silicon. However, certain chips may become too hot or perform their function too slowly if silicon is used as the base material. Alternative or specialty materials are used to replace silicon as the preferred base for the electronic circuit in these situations. We provide such alternative or specialty materials in the form of substrates or wafers, including compound and single element substrates. Our compound substrates combine indium with phosphorous (InP) or combine gallium with arsenic (GaAs). Our single element substrates are made from germanium (Ge).

Our headquarters is in Fremont, California in the San Francisco Bay Area. We manufacture all of our products in the People’s Republic of China and our supply chain includes AXT’s subsidiaries and joint venture companies in China. These companies produce products that include 99.99% pure gallium (4N Ga), high purity gallium, arsenic, germanium, germanium dioxide, pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). Our ownership and the ownership by our consolidated subsidiaries in these entities range from 83% to 20%. We consolidate the joint ventures in which we have either a controlling financial interest, or majority financial interest combined with the ability to exercise control in substance over the operation or financial decisions made by the investee. We use the equity method to account for joint ventures in which we have smaller financial interest and have the ability to exercise significant influence, but not control, over the investee. We purchase portions of the materials produced by these joint ventures for our own use and the joint ventures sell the remainder of their production to third parties.

Principles of Consolidation

The consolidated financial statements include the accounts of AXT, our wholly-owned subsidiary, Beijing Tongmei Xtal Technology Co., Ltd., and our majority-owned, or significantly controlled subsidiaries, Beijing JiYa Semiconductor Material Co., Ltd., Nanjing Jin Mei Gallium Co., Ltd. and Beijing BoYu Semiconductor Vessel Craftwork Technology Co., Ltd. All significant inter company accounts and transactions have been eliminated. Investments in business entities in which we do not have controlling interest, but have the ability to exercise significant influence over operating and financial policies (generally 20-50% ownership), are accounted for by the equity method. For partially-owned subsidiaries that we consolidate, we reflect the noncontrolling interest of the portion we do not own on our consolidated balance sheets in stockholders’ equity and in our consolidated statements of operations.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates, judgments and assumptions. We believe that the estimates, judgments, and assumptions upon which management relies are reasonable based on information available at the time that these estimates, judgments, and assumptions are made. These estimates, judgments, and assumptions can affect the reported amounts of assets and liabilities as of the date of the consolidated financial statements as well as the

reported amounts of revenues and expenses during the periods presented. To the extent there are material differences between these estimates and actual results, our consolidated financial statements would be affected.

Fair Value of Financial Instruments

The carrying amounts of certain of our financial instruments including cash and cash equivalents, accounts receivable, short-term investments and long-term investments, accounts payable and accrued liabilities approximate fair

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value due to their short maturities. Certain cash equivalents and investments are required to be adjusted to fair value on a recurring basis. See Note 2.

Fair Value of Investments

ASC topic 820, Fair value measurement ("ASC 820") establishes three levels of inputs that may be used to measure fair value.

Level 1 instruments represent quoted prices in active markets. Therefore, determining fair value for Level 1 instruments does not require significant management judgment, and the estimation is not difficult.

Level 2 instruments include observable inputs other than Level 1 prices, such as quoted prices for comparable instruments in markets with insufficient volume or infrequent transactions (less active markets), issuer credit ratings, non-binding market consensus prices that can be corroborated with observable market data, model-derived valuations in which all significant inputs are observable or can be derived principally from or corroborated with observable market data for substantially the full term of the assets or liabilities, or quoted prices for similar assets or liabilities. These Level 2 instruments require more management judgment and subjectivity compared to Level 1 instruments, including:

- Determining which instruments are most comparable to the instrument being priced requires management to identify a sample of similar securities based on the coupon rates, maturity, issuer, credit rating, and instrument type, and subjectively select an individual security or multiple securities that are deemed most similar to the security being priced.
- Determining which model-derived valuations to use in determining fair value requires management judgment. When observable market prices for identical securities or comparable securities are not available, we price our marketable debt instruments using non-binding market consensus prices that are corroborated with observable market data or pricing models, such as discounted cash flow models, with all significant inputs derived from or corroborated with observable market data.

Level 3 instruments include unobservable inputs to the valuation methodology that are significant to the measurement of fair value of assets or liabilities. The determination of fair value for Level 3 instruments requires the most management judgment and subjectivity. We place short-term foreign currency hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these foreign currency hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted in "accrued liabilities" on the consolidated balance sheet and classified as Level 3 assets and liabilities. As of December 31, 2015 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

Foreign Currency Translation

The functional currency of our Chinese subsidiaries is the Renminbi, the local currency of China. Transaction gains and losses resulting from transactions denominated in currencies other than the U.S. dollar or in the functional currencies of our subsidiaries are included in "other income (expense), net" for the years presented. The transaction gains for the year ended December 31, 2015 totaled $717,000 and the transaction losses for the years ended December 31, 2014 and 2013 totaled $1.0 million and $1.3 million, respectively.

The assets and liabilities of the subsidiaries are translated at the rates of exchange on the balance sheet date. Revenue and expense items are translated at the average rate of exchange for the period. Gains and losses from foreign currency translation are included in "other comprehensive income (loss)" in the consolidated statements of comprehensive

income (loss).

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Revenue Recognition

We manufacture and sell high-performance compound semiconductor substrates and sell certain raw materials including gallium, germanium dioxide, and pBN crucibles. After we ship our products, there are no remaining obligations or customer acceptance requirements that would preclude revenue recognition. Our products are typically sold pursuant to a purchase order placed by our customers. We recognize revenue upon shipment and transfer of title of products to our customers, which is either upon shipment from our dock, receipt at the customer's dock, or removal from consignment inventory at the customer's location, provided that we have received a valid purchase order, the price is fixed or determinable, title and risk of ownership have transferred, collection of resulting receivables is probable, and product returns are reasonably estimable. Revenue is net of any taxes assessed by any governmental authority. We do not provide training, installation or commissioning services. We assess the probability of collection based on a number of factors including past history with the customer and credit worthiness. We do not provide payment discounts. We provide for future returns based on historical experience, current economic trends and changes in customer demand at the time revenue is recognized.

Accounting for Sales Taxes in Net Revenues

We record sales taxes collected on sales of our products and for amounts not yet remitted to tax authorities as accrued liabilities on our consolidated balance sheets.

Risks and Concentration of Credit Risk

Our business is very dependent on the semiconductor, lasers and fiber optics industries which can be highly cyclical and experience downturns as a result of economic changes, overcapacity, and technological advancements. Significant technological changes in the industry or customer requirements, or the emergence of competitive products with new capabilities or technologies, could adversely affect our operating results. In addition, a significant portion of our revenues and net income is derived from international sales. Fluctuations of the United States dollar against foreign currencies and changes in local regulatory or economic conditions, particularly in an emerging market such as China, could adversely affect operating results.

We depend on a single or limited number of suppliers for certain critical materials used in the production of our substrates, such as quartz tubing and polishing solutions. We generally purchase these materials through standard purchase orders and not pursuant to long-term supply contracts.

Financial instruments that potentially subject us to concentration of credit risk consist primarily of cash equivalents, short-term investments, and trade accounts receivable. We invest primarily in money market accounts, commercial paper instruments, and investment grade securities with high quality financial institutions. The composition and maturities are regularly monitored by management. Such deposits are in excess of the amount of the insurance provided by the federal government on such deposits. We are exposed to credit risks in the event of default by the issuers to the extent of the amount recorded on the consolidated balance sheets.

We perform ongoing credit evaluations of our customers' financial condition, and limit the amount of credit extended when deemed necessary, but generally do not require collateral. The credit risk in our accounts receivable is mitigated by our credit evaluation process and the geographical dispersion of sales transactions. One customer accounted for 22% of our trade accounts receivable as of December 31, 2015 and two customers accounted for 11% and 10% of our accounts receivable balance as of December 31, 2014.

One customer, IQE Group, represented 12% of our revenue for the year ended December 31, 2015 while no customer represented more than 10% of our revenue for the years ended December 31, 2014 and 2013. Our top five customers, although not the same five customers for each period, represented 40%, 34% and 31% of revenue for the years ended December 31, 2015, 2014 and 2013, respectively. We believe that in the future we could have a greater concentration of sales.

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Cash and Cash Equivalents

We consider investments in highly liquid instruments purchased with an original maturity of three months or less to be cash equivalents. Cash equivalents consist primarily of certificate of deposits. Cash and cash equivalents are stated at cost, which approximates fair value.

Short-Term and Long-Term Investments

We classify our investments in marketable debt and equity securities as available-for-sale securities in accordance with ASC topic 320, Investments - Debt and Equity Securities ("ASC 320"). Short-term and long-term investments are comprised of available-for-sale marketable debt securities, which consist primarily of certificates of deposit, corporate bonds and notes, and government securities. These investments are reported at fair value as of the respective balance sheet dates with unrealized gains and losses included in accumulated other comprehensive income within stockholders' equity on the consolidated balance sheets. The amortized cost of securities is adjusted for amortization of premiums and accretion of discounts to maturity. Such amortization is included in "other income (expense), net" in the consolidated statements of operations. Realized gains and losses and declines in value judged to be other than temporary on available-for-sale securities are also included in "other income (expense), net" in the consolidated statements of operations. The cost of securities sold is based upon the specific identification method.

Accounts Receivable and Allowance for Doubtful Accounts and Sales Returns

Accounts receivable are recorded at the invoiced amount and are not interest bearing. We periodically review the likelihood of collection on our accounts receivable balances and provide an allowance for doubtful accounts receivable primarily based upon the age of these accounts. We evaluate receivables from U.S. customers with an emphasis on balances in excess of 90 days and for receivables from customers located outside the U.S. with an emphasis on balances in excess of 120 days and establish a reserve allowance on the receivable balances if needed. The reason for the difference in the evaluation of receivables between foreign and U.S. customers is that U.S. customers have historically made payments in a shorter period of time than foreign customers. Foreign business practices generally require us to allow customer payment terms that are longer than those accepted in the United States. We assess the probability of collection based on a number of factors, including the length of time a receivable balance has been outstanding, our past history with the customer and their credit worthiness.

We exercise judgment when determining the adequacy of these reserves as we evaluate historical bad debt trends, general economic conditions in the United States and internationally, and changes in customer financial conditions. Uncollectible receivables are recorded as bad debt expense when all efforts to collect have been exhausted and recoveries are recognized when they are received. As of December 31, 2015 and 2014, our accounts receivable, net balance was $18.5 million and $17.9 million, respectively, which was net of an allowance for doubtful accounts of $561,000 and $410,000, respectively. During 2015, we increased this allowance for doubtful accounts by $151,000 primarily because of the poor financial condition of a few customers. During 2014, we decreased this allowance for doubtful accounts by $459,000 primarily for improved collections from customers. No amounts have been written off. If actual uncollectible accounts differ substantially from our estimates, revisions to the estimated allowance for doubtful accounts would be required, which could have a material impact on our financial results for future periods.

The allowance for sales returns is also deducted from gross accounts receivable. During 2015, we utilized $423,000 and charged an additional $434,000 resulting in an ending balance for the allowance for sales returns of $424,000 as of December 31, 2015. During 2014, we utilized $410,000 and charged an additional $183,000 resulting in the allowance for sales returns of $413,000 as of December 31, 2014.

Warranty Reserve

We maintain a warranty reserve based upon our claims experience during the prior twelve months and any pending claims and returns of which we are aware. Warranty costs are accrued at the time revenue is recognized. As of December 31, 2015 and 2014, accrued product warranties totaled $497,000 and $802,000, respectively. The decrease in accrued product warranties is primarily attributable to decreased claims for quality issues experienced by some

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customers. If actual warranty costs or pending new claims differ substantially from our estimates, revisions to the estimated warranty liability would be required, which could have a material impact on our financial condition and results of operations for future periods.

Inventories

Inventories are stated at the lower of cost (approximated by standard cost) or market. Cost is determined using the weighted average cost method. Our inventory consists of raw materials as well as finished goods and work-in-process that include material, labor and manufacturing overhead costs. Given the nature of our substrate products, and the materials used in the manufacturing process, the wafers and ingots comprising work-in-process may be held in inventory for up to two years and three years, respectively, as the risk of obsolescence for these materials is low. We routinely evaluate the levels of our inventory in light of current market conditions in order to identify excess and obsolete inventory, and we provide a valuation allowance for certain inventories based upon the age and quality of the product and the projections for sale of the completed products.

Property, Plant and Equipment

Property, plant and equipment are stated at cost less accumulated depreciation computed using the straight-line method over the estimated economic lives of the assets, which vary from 1 to 27.5 years. Leasehold improvements are amortized using the straight-line method over the shorter of the estimated useful life or the term of the lease. We generally depreciate computer, software, office equipment, furniture and fixtures 3 to 5 years, machinery and equipment 1 to 5 years, automobiles 5 to 10 years, leasehold and building improvements over 10 years, or lease term if shorter, and buildings over 27.5 years. Repairs and maintenance costs are expensed as incurred.

Impairment of Long-Lived Assets

We evaluate the recoverability of property, equipment and intangible assets in accordance with ASC topic 360, Property, Plant and Equipment (“ASC 360”). When events and circumstance indicate that long-lived assets may be impaired, our management compares the carrying value of the long-lived assets to the projection of future undiscounted cash flows attributable to such assets. In the event that the carrying value exceeds the future undiscounted cash flows, we record an impairment charge against income equal to the excess of the carrying value over the asset’s fair value. Fair values are determined based on quoted market values, discounted cash flows or internal and external appraisals, as applicable. We did not recognize any impairment charges of long-lived assets in 2015, 2014 and 2013.

Impairment of Investments

All available-for-sale securities are periodically reviewed for impairment. An investment is considered to be impaired when its fair value is less than its amortized cost basis and it is more likely than not that we will be required to sell the impaired security before recovery of its amortized cost basis. Factors considered in determining whether a loss is temporary include the magnitude of the decline in market value, the length of time the market value has been below cost (or adjusted cost), credit quality, and our ability and intent to hold the securities for a period of time sufficient to allow for any anticipated recovery in market value.

We also invest in equity instruments of privately-held companies in China for business and strategic purposes. Investments in our non-consolidated joint venture companies are classified as other assets and accounted for under either the equity or cost method, depending on whether we have the ability to exercise significant influence over their operations or financial decisions. We monitor our investments for impairment and record reductions in carrying value when events or changes in circumstances indicate that the carrying value may not be recoverable. Determination of

impairment is highly subjective and is based on a number of factors, including an assessment of the strength of investee's management, the length of time and extent to which the fair value has been less than our cost basis, the financial condition and near-term prospects of the investee, fundamental changes to the business prospects of the investee, share prices of subsequent offerings, and our intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in our carrying value. We estimate fair value of our cost method investments considering available information

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such as pricing in recent rounds of financing, current cash positions, earnings and cash flow forecasts, recent operational performance and any other readily available market data.

Segment Reporting

We operate in one segment for the design, development, manufacture and distribution of high-performance compound semiconductor substrates and sale of materials. In accordance with ASC topic 280, Segment Reporting, our chief operating decision-maker has been identified as our Chief Executive Officer, who reviews operating results to make decisions about allocating resources and assessing our performance for the Company. We discuss revenue and capacity for both AXT and our joint ventures collectively, when determining capacity constraints and need for raw materials in our business, and consider their capacity when determining our strategic and product marketing and advertising strategies. While we consolidate our majority-owned or significantly controlled joint ventures, we do not allocate any portion of overhead, interest and other income, interest expense or taxes to them. We therefore have determined that our joint venture operations do not constitute an operating segment. Since we operate in one segment, all financial segment and product line information can be found in the consolidated financial statements.

Stock Based Compensation

We have employee stock option plans, which are described more fully in Note 11—Employee Benefit Plans and Stock-based Compensation. We account for stock based compensation in accordance with the provisions of ASC topic 718, Compensation-Stock Compensation (“ASC 718”). We utilize the Black-Scholes option pricing model to determine the fair value of the stock options granted. Stock based compensation cost is measured at each grant date, based on the fair value of the award, and is recognized as expense and as an increase in additional paid-in-capital over the requisite service period of the award.

Research and Development

Research and development costs consist primarily of salaries, including stock-based compensation expense and related personnel costs, depreciation, materials and product testing and are expensed as incurred.

Advertising Costs

Advertising costs, included in selling, general and administrative expenses, are expensed as incurred. Advertising costs for the years ended December 31, 2015, 2014 and 2013 were $10,000, $10,000 and $12,000, respectively.

Shipping and Handling costs

We include fees billed to customers and costs incurred for shipping and handling as a component of cost of sales.

Income Taxes

We account for income taxes in accordance with ASC topic 740, Income Taxes (“ASC 740”) which requires that deferred tax assets and liabilities be recognized using enacted tax rates for the effect of temporary differences between the book and tax bases of recorded assets and liabilities. ASC 740 also requires that deferred tax assets be reduced by a valuation allowance if it is more likely than not that a portion of the deferred tax asset will not be realized. The impact of ASC 740 is more fully described in Note 13.

Comprehensive Income (loss)

We report comprehensive income (loss) in accordance with the provisions of ASC topic 220 Comprehensive Income (“ASC 220”) which establishes standards for reporting comprehensive income or loss and its components in the financial statements. The components of other comprehensive income include unrealized gains and losses on marketable

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securities and foreign currency translation adjustments. Comprehensive income (loss) is presented in the consolidated statements of comprehensive income (loss).

Net Income (loss) Per Share

Basic net income (loss) per share is computed using the weighted average number of common shares outstanding during the periods less shares of common stock subject to repurchase and non-vested stock awards. Diluted net income (loss) per share is computed using the weighted average number of common shares outstanding and potentially dilutive common shares outstanding during the periods. The dilutive effect of outstanding stock options and restricted stock awards is reflected in diluted earnings per share by application of the treasury stock method. Potentially dilutive common shares consist of common shares issuable upon the exercise of stock options and vesting of restricted stock awards.

Recent Accounting Pronouncements

In January 2016, the FASB issued ASU 2016-01, which made changes to the accounting for financial instruments that primarily affect equity investments, financial liabilities under the fair value option, and the presentation and disclosure requirements for financial instruments. The amendments in this update supersede the guidance to classify equity securities with readily determinable fair values into different categories (that is, trading or available-for-sale) and require equity securities to be measured at fair value with changes in the fair value recognized through net income. The standard amends financial reporting by providing relevant information about an entity’s equity investments and reducing the number of items that are recognized in other comprehensive income. This update will be effective for the annual periods beginning after December 15, 2017, and interim periods within those annual periods. We are currently assessing the impact of the future adoption of this standard on our consolidated financial statements.

In May 2014, the FASB issued ASU 2014-09, which applies to any entity that either enters into contracts with customers to transfer goods or services or enters into contracts for the transfer of non-financial assets, unless those contracts are within the scope of other standards, superseding the existing revenue recognition requirements in ASC Topic 605 “Revenue Recognition.” Pursuant to ASU 2014-09, an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange, as applied through a multi-step process to achieve that core principle. Subsequently, the FASB approved a deferral included in ASU 2015-14 that permits public entities to apply the amendments in ASU 2014-09 for annual reporting periods beginning after December 15, 2017, including interim reporting periods therein, and that would also permit public entities to elect to adopt the amendments as of the original effective date as applicable to reporting periods beginning after December 15, 2016. The new guidance allows for the amendment to be applied either retrospectively to each prior reporting period presented or retrospectively as a cumulative-effect adjustment as of the date of adoption. We are currently evaluating the impact that the adoption of ASU 2014-09 and ASU 2015-14 may have on our consolidated financial statements and have not elected a transition method as of the year ended December 31, 2015.

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Note 2. Cash, Cash Equivalents and Investments

Our cash and cash equivalents consist of cash and instruments with original maturities of less than 90 days. Our investments consist of instruments with original maturities of more than 90 days. As of December 31, 2015 and, 2014, our cash, cash equivalents and investments are classified as follows (in thousands):

	December 31, 2015				December 31, 2014			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized (Loss)	Fair Value	Amortized Cost	Gross Unrealized Gain	Gross Unrealized (Loss)	Fair Value
Classified as:								
Cash	$ 10,289	$ —	$ —	$ 10,289	$ 22,337	$ —	$ —	$ 22,337
Cash equivalents:								
Certificates of deposit 1	14,586	—	—	14,586	6,454	—	—	6,454
Money market fund	—	—	—	—	23	—	—	23
Total cash and cash equivalents	24,875	—	—	24,875	28,814	—	—	28,814
Investments (available for sale):								
Certificates of deposit 2	9,795	1	(13)	9,783	10,195	1	(13)	10,183
Corporate bonds	8,776	—	(63)	8,713	9,214	1	(29)	9,186
Corporate equity securities	200	432	—	632	44	710	—	754
Total investments	18,771	433	(76)	19,128	19,453	712	(42)	20,123
Total cash, cash equivalents and investments	$ 43,646	$ 433	$ (76)	$ 44,003	$ 48,267	$ 712	$ (42)	$ 48,937
Contractual maturities on investments:								
Due within 1 year	$ 11,022			$ 11,437	$ 11,631			$ 12,340
Due after 1 through 5 years	7,749			7,691	7,822			7,783
	$ 18,771			$ 19,128	$ 19,453			$ 20,123

1. Certificate of deposit with original maturities of less than 90 days.
2. Certificate of deposit with original maturities of more than 90 days.

We manage our investments as a single portfolio of highly marketable securities that is intended to be available to meet our current cash requirements. We have no investments in auction rate securities. Certificates of deposit and

corporate bonds are typically held until maturity. Corporate equity securities have no maturity and may be sold at any time. Our holding of corporate equity securities consists of common stock of GCS Holdings, Inc. (“GHI”) (previously Global Communication Semiconductors, Inc), a Taiwan publicly-traded company. Previously, we also owned the common stock of Intelligent Epitaxy Technology, Inc. (“IntelliEpi”). We began classifying IntelliEpi stock as an available-for-sale security upon its initial public offering in 2013. We sold our remaining IntelliEpi stock in the second quarter of 2015. As of December 31, 2015, we no longer hold any IntelliEpi stock. In 2015, our cash proceeds from sales of available-for-sale investments were $902,000, our cost was $43,000 and our gross realized gain from sales of available-for-sale investments was $859,000. In 2014, our cash proceeds from sales of available-for-sale investments were $1.3 million, our cost was $82,000 and our gross realized gain from sales of available-for-sale investments was $1.3 million. There were no sales of available-for-sales securities and no realized gains and losses for the year ended December 31, 2013.

We began classifying GHI as an available-for-sale security in the second quarter of 2015 when we determined that there was sufficient trading volume in the exchange for the stock to be deemed readily marketable. An unrealized gain of $432,000 net of tax was recorded as of December 31, 2015. This security is valued at fair market value at

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December 31, 2015 and will be marked to market with changes through other comprehensive income until sold. There is no assurance that we will realize this value when the stock is sold in the future.

The gross unrealized losses related to our portfolio of available-for-sale securities were primarily due to changes in interest rates and market and credit conditions of the underlying securities. We have determined that the gross unrealized losses on some of our available-for-sale securities as of December 31, 2015 are temporary in nature. We periodically review our investment portfolio to identify and evaluate investments that have indications of possible impairment. Factors considered in determining whether a loss is temporary include the magnitude of the decline in market value, the length of time the market value has been below cost (or adjusted cost), credit quality, and our ability and intent to hold the securities for a period of time sufficient to allow for any anticipated recovery in market value.

A portion of our investments would generate a loss if we sold them on December 31, 2015. The following table summarizes the fair value and gross unrealized losses related to available-for-sale securities, aggregated by investment category and length of time that individual securities have been in a continuous unrealized loss position as of December 31, 2015 (in thousands):

	In Loss Position < 12 months		In Loss Position > 12 months		Total In Loss Position	
As of December 31, 2015	Fair Value	Gross Unrealized (Losses)	Fair Value	Gross Unrealized (Losses)	Fair Value	Gross Unrealized (Losses)
Investments:						
Certificates of deposit	$ 4,509	$ (11)	$ 3,543	$ (2)	$ 8,052	$ (13)
Corporate bonds	6,866	(56)	1,847	(7)	8,713	$ (63)
Total in loss position	$ 11,375	$ (67)	$ 5,390	$ (9)	$ 16,765	$ (76)

The following table summarizes the fair value and gross unrealized losses related to available-for-sale securities, aggregated by investment category and length of time that individual securities have been in a continuous unrealized loss position as of December 31, 2014 (in thousands):

	In Loss Position < 12 months		In Loss Position > 12 months		Total In Loss Position	
As of December 31, 2014	Fair Value	Gross Unrealized (Loss)	Fair Value	Gross Unrealized (Loss)	Fair Value	Gross Unrealized (Loss)
Investments:						
Certificates of deposit	$ 4,492	$ (13)	$ —	$ —	$ 4,492	$ (13)
Corporate bonds	3,770	(27)	4,309	(2)	8,079	$ (29)
Total in loss position	$ 8,262	$ (40)	$ 4,309	$ (2)	$ 12,571	$ (42)

Investments in Privately-held Companies

We have made strategic investments in private companies located in China in order to gain access at a competitive cost to raw materials that are critical to our substrate business (see Note 6). The investment balances for all of these companies, including minority investments indirectly in privately-held companies made by our consolidated

subsidiaries accounted for under the equity method, are included in “other assets” in the consolidated balance sheets and totaled $12.1 million and $12.1 million as of December 31, 2015 and December 31, 2014, respectively.

As noted above, in the second quarter of 2015, we re-classified our minority investment in one company, which was accounted for under the cost method, as available-for- sale short-term investments and written-up to market value. As of December 31, 2015, we no longer maintain any investments under the cost method. As of December 31, 2014 and 2013, our investments in this unconsolidated company had a carrying value of $200,000 and were also included in “other assets” in the consolidated balance sheets.

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Fair Value Measurements

We invest primarily in money market accounts, certificates of deposits, corporate bonds and notes, and government securities. ASC topic 820, Fair value measurement ("ASC 820"), establishes three levels of inputs that may be used to measure fair value. Level 1 instrument valuations are obtained from real-time quotes for transactions in active exchange markets of the asset or similar assets. Level 2 instrument valuations are obtained from readily-available, observable pricing sources for comparable instruments. Level 3 instrument valuations are obtained from unobservable inputs in which there is little or no market data, which require us to develop our own assumptions. On a recurring basis, we measure certain financial assets and liabilities at fair value, primarily consisting of our short-term and long-term investments.

The type of instrument valued based on quoted market prices in active markets include our money market funds, which are generally classified within Level 1 of the fair value hierarchy. Other than corporate equity securities which are based on quoted market prices and classified as Level 1, we classify our available-for-sale securities including certificates of deposit and corporate bonds as having Level 2 inputs. The valuation techniques used to measure the fair value of these financial instruments having Level 2 inputs were derived from bank statements, quoted market prices, broker or dealer statements or quotations, or alternative pricing sources with reasonable levels of price transparency. There were no changes in valuation techniques or related inputs in the year ended December 31, 2015. There have been no transfers between fair value measurement levels during the year ended December 31, 2015.

We place short-term foreign currency hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these foreign currency hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted in "accrued liabilities" on the consolidated balance sheet and classified as Level 3 assets and liabilities. As of December 31, 2015, the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

The following table summarizes our financial assets and liabilities measured at fair value on a recurring basis in accordance with ASC 820 as of December 31, 2015 (in thousands):

	Balance as of December 31, 2015	Quoted Prices in Active Markets of Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents and investments:				
Certificates of deposit	$ 9,783	$ —	$ 9,783	$ —
Corporate bonds	8,713	—	8,713	—
Corporate equity securities	632	632	—	—
Total	$ 19,128	$ 632	$ 18,496	$ —
Liabilities:				
Foreign currency hedge obligations	$ 36	$ —	$ —	$ 36

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The following table summarizes our financial assets and liabilities measured at fair value on a recurring basis in accordance with ASC 820 as of December 31, 2014 (in thousands):

	Balance as of December 31, 2014	Quoted Prices in Active Markets of Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents and investments:				
Money market fund	$ 23	$ 23	$ —	$ —
Certificates of deposit	10,183	—	10,183	—
Corporate bonds	9,186	—	9,186	—
Corporate equity securities	754	754	—	—
Total	$ 20,146	$ 777	$ 19,369	$ —
Liabilities	$ —	$ —	$ —	$ —

Items Measured at Fair Value on a Nonrecurring Basis

Certain assets that are subject to nonrecurring fair value measurements are not included in the table above. These assets include investments in privately-held companies accounted for by equity and cost method (See Note 6). We did not record other-than-temporary impairment charges for these investments during 2015.

Note 3. Inventories

The components of inventory are summarized below (in thousands):

	December 31, 2015	December 31, 2014
Inventories:		
Raw materials	$ 19,532	$ 18,990
Work in process	16,007	16,222
Finished goods	2,473	3,362
	$ 38,012	$ 38,574

As of December 31, 2015 and 2014, carrying values of inventories were net of inventory reserve of $12.0 million and $11.2 million, respectively, for excess and obsolete inventory.

Note 4. Related Party Transactions

In August 2011, our consolidated joint venture, Beijing JiYa Semiconductor Material Co., Ltd. (“JiYa”), entered into a non-interest bearing note agreement in the amount of $1.6 million for a loan to one of its equity investment entities. The original term of the loan was for two years and ten months with three periodic principal payments required. After various amendments to the terms of the note, in December 2013 the parties agreed to delay all principal repayment until December 2017. As of December 31, 2015 and December 31, 2014, we included $1.6 million and $1.7 million

million respectively, in “Related party notes receivable – long term” in our consolidated balance sheets.

JiYa also purchases raw materials from one of its equity investment entities for production in the ordinary course of business. As of December 31, 2015 and 2014, amounts payable of $2.4 million and $1.8 million, respectively, were included in “accounts payable” in our consolidated balance sheets.

JiYa also sells raw materials to one of its equity investment entities for production in the ordinary course of business. As of December 31, 2015 and 2014, amounts receivable of $473,000 and $350,000, respectively, were included in “accounts receivable” in our consolidated balance sheets.

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Beginning in 2012, our consolidated joint venture, Nanjing Jin Mei Gallium Co., Ltd. (“Jin Mei”), is contractually obligated under an agency sales agreement to sell raw material on behalf of its equity investment entity. Jin Mei bills the customers and remits the receipts, net of its portions of sales commission, to this equity investment entity. For the year ended December 31, 2015 and 2014, Jin Mei has recorded $1,000 and $20,000 income from agency sales, respectively, which were included in “other income (expense), net” in the consolidated statements of operations.

In March 2012, our wholly-owned subsidiary, Beijing Tongmei Xtal Technology Co., Ltd. (“Tongmei”), entered into an operating lease for the land it owns with our consolidated joint venture Beijing BoYu Semiconductor Vessel Craftwork Technology Co., Ltd. The lease agreement for the land of approximately 22,081 square feet commenced on January 1, 2012 for a term of 10 years with annual lease payments of $24,000 subject to a 5% increase at each third year anniversary. The annual lease payment is due by January 31 of each year.

Tongmei has paid $114,000 on behalf of Donghai County Dongfang High Purity Electronic Materials Co., Ltd. (“Dongfang”), its equity investment entity, to purchase materials. The original agreement was signed between Tongmei and Dongfang in 2014 and the date of repayment was set on December 31, 2015. In 2015, both parties agreed to delay the date of repayment to December 31, 2017. As of December 31, 2015, this balance was included in “Related party notes receivable – long term” in our consolidated balance sheets.

In April 2014, Tongmei loaned an additional of $46,000 to Dongfang. The loan bears interest at 6.15% per annum and the principal and interest totaling $51,000 as of December 31, 2015 is due on December 31, 2017. As of December 31, 2015, this balance, including both principal and interest, was included in “Related party notes receivable – long term” in our consolidated balance sheets.

Tongmei also purchases raw materials from one of our equity investment entities for production in the ordinary course of business. As of December 31, 2015 and 2014, amounts payable of $70,000 and $513,000, respectively, were included in “accounts payable” in our consolidated balance sheets.

Beijing Kaide Quartz Co. Ltd. (“Kaide”) has been a supplier of customized quartz tubes to the Company since 2004. Beijing XiangHeMing Trade Co. Ltd., (“XiangHeMing”) is a significant shareholder of Kaide. XiangHeMing was previously owned by, among others, certain immediate family members of Davis Zhang, our former President, China Operations, until at least sometime in 2004, at which time the official Chinese government records indicate that Mr. Zhang’s immediate family members transferred their ownership of XiangHeMing to a third party. However, we are currently unable to conclusively determine whether Mr. Zhang’s immediate family members retained any economic interest in XiangHeMing after the transfer. As of December 31, 2015 and 2014, amounts payable to Kaide of $379,000 and $730,000, respectively, were included in “accounts payable” in our consolidated balance sheets.

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Our Related Party Transactions Policy seeks to prohibit all conflicts of interest in transactions between related parties and us, unless they have been approved by our Board of Directors. This policy applies to all of our employees, directors, and our consolidated subsidiaries. Our executive officers retain board seats on the board of directors of the companies in which we have invested in our China joint ventures. See Note 6 for further details.

Note 5. Property, Plant and Equipment, Net

The components of our property, plant and equipment are summarized below (in thousands):

	As of December 31,	
	2015	2014
Property, plant and equipment:		
Building	$ 30,388	$ 30,469
Machinery and equipment	40,899	41,900
Leasehold improvements	5,059	5,070
Construction in progress	3,596	1,918
	79,942	79,357
Less: accumulated depreciation and amortization	(48,520)	(45,495)
	$ 31,422	$ 33,862

Depreciation and amortization expense was $5.5 million, $5.6 million and $5.5 million for the years ended 2015, 2014, and 2013 respectively.

Note 6. Investments in Privately-held Companies

We have made strategic investments in private companies located in China in order to gain access at a competitive cost to raw materials that are critical to our substrate business. Our consolidated subsidiaries have also made investments in private companies. These companies form part of our overall supply chain.

Our direct investments are summarized below (in thousands):

	Investment Balance as of				
Company	December 31, 2015	December 31, 2014	Accounting Method	Ownership Percentage	
Beijing JiYa Semiconductor Material Co., Ltd.	$ 3,331	$ 3,331	Consolidated	46	%
Nanjing Jin Mei Gallium Co., Ltd.	592	592	Consolidated	83	%
Beijing BoYu Semiconductor Vessel Craftwork Technology Co., Ltd.	1,346	1,346	Consolidated	70	%
	$ 5,269	$ 5,269			
Donghai County Dongfang High Purity Electronic Materials Co., Ltd.	$ 1,524	$ 1,723	Equity	46	%
Xilingol Tongli Germanium Co. Ltd.	5,343	5,351	Equity	25	%
Emeishan Jia Mei High Purity Metals Co., Ltd.	1,081	1,021	Equity	25	%
	$ 7,948	$ 8,095			

Our ownership of Beijing JiYa Semiconductor Material Co., Ltd. (“JiYa”) is 46%. We continue to consolidate JiYa as we are the founding and the largest shareholder, we appoint the general manager and controller and have the ability to exercise control in substance over the long-term strategic decisions made. Our Chief Executive Officer is chairman of the JiYa board and we have appointed one other representative, Davis Zhang, to serve on the board. Mr. Zhang was an executive officer of AXT for 27 years. Further, our Chief Financial Officer, Gary Fischer, is on the board of supervisors of JiYa.

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Our ownership of Nanjing Jin Mei Gallium Co., Ltd. (“Jin Mei”) is 83%. We continue to consolidate Jin Mei as we have a controlling financial interest and have majority control of the board. Our Chief Executive Officer is chairman of the Jin Mei board and we have appointed two other representatives to serve on the board.

Our ownership of Beijing BoYu Semiconductor Vessel Craftwork Technology Co., Ltd (BoYu) is 70%. We continue to consolidate BoYu as we have a controlling financial interest and have majority control of the board. Our Chief Executive Officer is chairman of the BoYu board and we have appointed two other representatives to serve on the board.

Although we have representation on the boards of directors of each of these companies, the daily operations of each of these companies are managed by local management and not by us. Decisions concerning their respective short- term strategy and operations, any capacity expansion and annual capital expenditures, and decisions concerning sales of finished product, are made by local management with regular guidance and input from us.

During 2015, 2014 and 2013, the three consolidated joint ventures generated $0.8 million, $3.0 million and $3.5 million of income, respectively, of which a loss of $0.3 million, a gain of $0.7 million and a gain of $1.1 million, respectively were allocated to noncontrolling interests, resulting in $1.2 million, $2.3 million and $2.4 million of income, respectively, to our net income.

For AXT’s three minority investment entities that are not consolidated, the investment balances are included in “other assets” in our consolidated balance sheets and totaled $7.9 million and $8.1 million as of December 31, 2015 and 2014, respectively. We own 46% of the ownership interests in one of these companies and 25% in each of the other two companies. These three companies are not considered variable interest entities because:

- all three companies have sustainable businesses of their own;
- our voting power is proportionate to our ownership interests;
- we only recognize our respective share of the losses and/or residual returns generated by the companies if they occur; and
- we do not have controlling financial interest in, do not maintain operational or management control of, do not control the board of directors of, and are not required to provide additional investment or financial support to any of these companies.

These three equity investment entities generated for AXT an equity loss of $43,000 for the year ended December 31, 2015 $569,000 and $270,000 for the years ended December 31, 2014, and 2013, respectively, which was recorded as “equity in earnings of unconsolidated joint ventures” in the consolidated statements of operations.

Net income recorded from all of the consolidated joint ventures and these three equity investment entities was $1.1 million, $2.9 million and $2.6 million for the years ended December 31, 2015, 2014, and 2013, respectively.

We also maintain four minority investments indirectly in privately-held companies through our consolidated joint ventures. Our subsidiary, Jiya, has three investments. Our subsidiary, Jinmei, has one investment. These minority investments are accounted for under the equity method in the books of our consolidated joint ventures. As of December 31, 2015 and 2014, our consolidated joint ventures included these minority investments in “other assets” in the consolidated balance sheets with a carrying value of $4.1 million and $4.0 million, respectively.

AXT’s three direct minority investment entities and the three minority investments of Jiya and the one minority investment of Jinmei are not consolidated and are accounted for under the equity method and had the following summarized income information (in thousands) for the years ended December 31, 2015, 2014 and 2013, respectively:

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	Year Ended December 31,			Our share for the Year Ended December 31,		
	2015	2014	2013	2015	2014	2013
Net revenue	$ 36,259	$ 47,824	$ 41,257	$ 9,112	$ 11,887	$ 10,240
Gross profit	8,327	21,436	13,836	1,954	5,340	3,328
Operating income	2,494	9,046	8,174	494	2,059	1,820
Net income	2,371	6,765	6,315	462	1,528	1,377

These seven minority investment entities that are not consolidated, but rather are accounted for under the equity method and had the following summarized balance sheet information (in thousands) for the years ended December 31, 2015 and 2014, respectively:

	As of December 31,	
	2015	2014
Current assets	$ 32,097	$ 31,482
Noncurrent assets	35,917	39,275
Current liabilities	18,185	19,923
Noncurrent liabilities	571	169

Our portion of the entity earnings from these seven minority investment entities that are not consolidated and are accounted for under the equity method were $462,000, $1.5 million and $1.4 million for the years ended December 31, 2015, 2014 and 2013, respectively. Dividends received from these minority investment entities were $305,000, $327,000 and $396,000 for the years ended December 31, 2015, 2014 and 2013, respectively. Undistributed retained earnings relating to our investments in all these minority investment entities were $6.6 million and $6.5 million as of December 31, 2015 and 2014, respectively.

Note 7. Other Investments

During the second quarter of 2015, we re-classified our sole minority investment under the cost method as an available-for-sale security when we determined that there was sufficient trading volume in the exchange for the stock to be deemed readily marketable. As of December 31, 2015, we do not maintain any investments under the cost method. As of December 31, 2014, our investments in this unconsolidated company had a carrying value of $200,000 and were included in “other assets” in the consolidated balance sheets.

Note 8. Accrued Liabilities

The components of accrued liabilities are summarized below (in thousands):

	As of December 31,	
	2015	2014
Accrued compensation and related charges	$ 2,129	$ 2,656
Accrued professional services	709	509

Current portion of royalty payments	575	800
Dividends payable by consolidated joint ventures	534	563
Accrued product warranty	497	802
Accrued income taxes	225	119
Other accrued liabilities	1,712	2,185
	$ 6,381	$ 7,634

Note 9. Debt

Prior to 2015, we had an unused credit facility with a bank that provided for a line of credit of $10.0 million. The line of credit was secured by marketable securities we had with the bank at that time. This line of credit was never used and there were no outstanding borrowings under this line of credit as of December 31, 2015 and 2014. This line of

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credit was terminated in January 2015 when we closed our investment account with this institution and moved all of our funds from this bank to a different bank.

Note 10. Stockholders' Equity and Stock Repurchase Program

Stockholders' Equity

The 883,000 shares of $0.001 par value Series A preferred stock issued and outstanding as of December 31, 2015 and 2014, valued at $3,532,000 are non-voting and non-convertible preferred stock with a 5.0% cumulative annual dividend rate payable when declared by the board of directors and $4 per share liquidation preference over common stock, and must be paid before any distribution is made to common stockholders. These preferred shares were issued to Lyte Optronics, Inc. stockholders in connection with the completion of our acquisition of Lyte Optronics, Inc. on May 28, 1999.

Stock Repurchase Program

On February 21, 2013, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $6.0 million of our outstanding common stock through February 27, 2014. These purchases were to be made from time to time in the open market and were funded from our existing cash balances and cash generated from operations. During 2013, we repurchased approximately 285,000 shares at an average price of $2.51 per share for a total purchase price of $716,000 under the stock repurchase program. As of December 31, 2013, approximately $5.3 million remained available for future repurchases under this program. No shares were repurchased in 2014 under this program and the plan expired on February 27, 2014.

On October 27, 2014, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $5.0 million of our outstanding common stock. These repurchases can be made from time to time in the open market and are funded from our existing cash balances and cash generated from operations. During 2015, we repurchased approximately 908,000 shares at an average price of $2.52 per share for a total purchase price of approximately $2.3 million under the stock repurchase program. As of December 31, 2015, approximately $2.7 million remained available for future repurchases under this program. See Item 5, Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities in Part II.

Note 11. Employee Benefit Plans and Stock-based Compensation

Stock Option Plans and Equity Incentive Plans

In July 1997, our board of directors approved the 1997 Stock Option Plan ("1997 Plan"), which provides for the grant of incentive and non-qualified stock options to our employees, consultants and directors. Under the 1997 Plan, 5,423,583 shares of common stock have been authorized for issuance. Options granted under the 1997 Plan are generally for periods not to exceed ten years (five years if the option is granted to a 10% stockholder) and are granted at the fair market value of the stock at the date of grant as determined by the board of directors. Options granted under the 1997 Plan generally vest 25% at the end of one year and 2.1% each month thereafter, with full vesting after four years.

In May 2007, our shareholders approved our 2007 Equity Incentive Plan (the "2007 Plan"). The 2007 Plan is a restatement of the 1997 Plan which expired in 2007. The 1,928,994 share reserve of the 1997 Plan became the reserve of the 2007 Plan, together with 1,300,000 additional shares approved for issuance under the 2007 Plan. In May 2013, the shareholders approved an additional 2,000,000 shares to be issued under the 2007 plan. Awards may be made under the 2007 Plan are stock options, stock appreciation rights, restricted stock, restricted stock units, performance shares, performance units, deferred compensation awards and other stock based awards. Stock options and stock

appreciation rights awarded under the 2007 Plan may not be repriced without stockholder approval. Stock options and stock appreciation rights may not be granted below fair market value. Stock options or stock appreciation rights generally shall not be fully vested over a period of less than three years from the date of grant and cannot be exercised more than 10 years from the date of grant. Restricted stock, restricted stock units, and performance awards generally shall not vest faster than over a three-year period (or a twelve month period if vesting is based on a performance measure). In

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December 2008, the 2007 Plan was amended to comply with the applicable requirements under Section 409A of the Internal Revenue Code.

In May 2015, our shareholders approved our 2015 Equity Incentive Plan (the "2015 Plan"). The 2015 Plan is a replacement of the 2007 Plan. Awards that may be made under the 2015 Plan are stock options, stock appreciation rights, restricted stock, restricted stock units, performance shares, performance units, deferred compensation awards and other stock based awards. Stock options and stock appreciation rights awarded under the 2015 Plan may not be repriced without stockholder approval. Stock options and stock appreciation rights may not be granted below fair market value. Stock options or stock appreciation rights generally shall not be fully vested over a period of less than four years from the date of grant and cannot be exercised more than 10 years from the date of grant. Restricted stock, restricted stock units, and performance awards generally shall not vest faster than over a three-year period (or a twelve month period if vesting is based on a performance measure). However, options granted to consultants and restricted stock awards granted to independent board members typically vest in one year and the Plan does allow for similar vesting to employees. As of December 31, 2015, approximately 2,822,000 shares were available for grant under the 2015 Plan.

Stock Options

The following table summarizes the stock option transactions for each of the years ended December 31, 2013, 2014 and 2015 (in thousands, except per share data):

Stock Options	Number of Options Outstanding	Weighted-average Exercise Price	Weighted-average Remaining Contractual Life (in years)	Aggregate Intrinsic Value
Balance as of January 1, 2013	2,727	3.28	6.71	$ 1,353
Granted	488	2.38		
Exercised	(331)	1.62		
Canceled and expired	(213)	3.60		
Balance as of December 31, 2013	2,671	3.29	6.71	$ 893
Granted	712	2.40		
Exercised	(111)	1.21		
Canceled and expired	(74)	5.18		
Balance as of December 31, 2014	3,198	$ 3.12	6.95	$ 1,247
Granted	866	2.19		
Exercised	(119)	1.38		
Canceled and expired	(166)	3.03		
Balance as of December 31, 2015	3,779	$ 2.97	6.26	$ 764
Options vested as of December 31, 2015 and unvested options expected to vest, net of forfeitures	3,691	$ 2.99	6.19	$ 742
Options exercisable as of December 31, 2015	2,237	$ 3.42	4.41	$ 453

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The options outstanding and exercisable as of December 31, 2015 were in the following exercise price ranges (in thousands, except per share data):

	Options Outstanding as of December 31, 2015			Options Vested and Exercisable as of December 31, 2015	
Range of Exercise Price	Shares	Weighted average Exercise Price	Weighted average Remaining Contractual Life	Shares	Weighted Average Exercise Price
$ 1.59 - $ 2.04	623	$ 1.83	2.32	623	$ 1.83
$ 2.14 - $ 2.14	52	$ 2.14	8.33	21	$ 2.14
$ 2.18 - $ 2.18	846	$ 2.18	9.50	—	$ —
$ 2.29 - $ 2.29	200	$ 2.29	8.42	75	$ 2.29
$ 2.36 - $ 2.36	383	$ 2.36	7.17	215	$ 2.36
$ 2.47 - $ 2.47	399	$ 2.47	8.48	120	$ 2.47
$ 2.51 - $ 2.51	20	$ 2.51	9.33	13	$ 2.51
$ 2.91 - $ 2.91	408	$ 2.91	5.81	329	$ 2.91
$ 3.18 - $ 4.81	386	$ 4.72	4.19	384	$ 4.73
$ 4.92 - $ 7.82	462	$ 5.87	3.78	457	$ 5.87
	3,779	$ 2.97	6.26	2,237	$ 3.42

There were 119,000, 111,000 and 331,000 options exercised in the years ended December 31, 2015, 2014 and 2013, respectively. The total intrinsic value of options exercised for the years ended December 31, 2015, 2014 and 2013, was $118,000, $105,000 and $331,000, respectively.

As of December 31, 2015, the unamortized compensation costs related to unvested stock options granted to employees under our stock option plan was approximately $1.4 million, net of estimated forfeitures of $94,000. These costs will be amortized on a straight-line basis over a weighted-average period of approximately 3.1 years and will be adjusted for subsequent changes in estimated forfeitures. We did not capitalize any stock based compensation to inventory as of December 31, 2015 and 2014, due to the immateriality of the amount.

Restricted Stock Awards

A summary of activity related to restricted stock awards for the years ended December 31, 2013, 2014 and 2015 is presented below (in thousands, except per share data):

Stock Awards	Shares	Weighted-Average Grant Date Fair Value
Non-vested as of January 1, 2013	239	$ 4.27
Granted	104	$ 2.52
Vested	(85)	$ 4.56
Forfeited	(16)	$ 4.03
Non-vested as of December 31, 2013	241	$ 3.44
Granted	121	$ 2.34
Vested	(101)	$ 4.01

Forfeited	—		—
Non-vested as of December 31, 2014	261	$	2.71
Granted	547	$	2.42
Vested	(215)	$	2.81
Forfeited	(47)	$	2.47
Non-vested as of December 31, 2015	546	$	2.39

Total grant date fair value of stock awards vested during the years ended December 31, 2015, 2014 and 2013 was $605,000, $405,000 and $389,000, respectively. As of December 31, 2015, we had $1.2 million of unrecognized

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compensation expense related to restricted stock awards, which will be recognized over the weighted average period of 1.8 years.

Common Stock

The following number of shares of common stock were reserved and available for future issuance at December 31, 2015 (in thousands, except per share data):

Options outstanding	3,779
Restricted stock awards outstanding	546
Stock available for future grant: 2015 Equity Incentive Plan	2,822
Total	7,147

Stock-based Compensation

We recorded $1.3 million, $1.1 million and $1.3 million of stock based compensation in our consolidated statements of operations for the years ended December 31, 2015, 2014 and 2013, respectively. The following table summarizes compensation costs related to our stock based compensation awards (in thousands, except per share data):

	Year Ended December 31,		
	2015	2014	2013
Stock based compensation in the form of employee stock options and restricted stock, included in:			
Cost of revenue	$ 20	$ 18	$ 22
Selling, general and administrative	1,148	938	1,091
Research and development	181	173	164
Total stock-based compensation	1,349	1,129	1,277
Tax effect on stock-based compensation	—	—	—
Net effect on net income (loss)	$ 1,349	$ 1,129	$ 1,277
Shares used in computing basic net income per share	32,183	32,452	32,700
Shares used in computing diluted net income per share	32,183	32,452	32,700
Effect on basic net income per share	$ (0.04)	$ (0.03)	$ (0.04)
Effect on diluted net income per share	$ (0.04)	$ (0.03)	$ (0.04)

We estimate the fair value of stock options using a Black Scholes valuation model. There were 866,000, 712,000 and 488,000 stock options granted with weighted average grant date fair value of $0.88, $1.17 and $1.09 per share during 2015, 2014 and 2013, respectively. The fair value of options granted was estimated at the date of grant using the following weighted average assumptions:

	Year Ended December 31,		
	2015	2014	2013
Expected term (in years)	3.9	4.1	4

Volatility	51.1	%	63.2	%	59.2	%
Expected dividend	—	%	—	%	—	%
Risk-free interest rate	1.75	%	1.85	%	0.98	%

The expected term for stock options is based on the observed historical option exercise behavior and post-vesting forfeitures of options by our employees, and the contractual term, the vesting period and the expected term of the outstanding options. Expected volatility is based on the historical volatility of our Company's common stock. The dividend yield of zero is based on the fact that we have never paid cash dividends and have no present intention to pay cash dividends. The risk-free interest rates are taken from the Daily Federal Yield Curve Rates as of the grant dates as

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published by the Federal Reserve and represent the yields on actively traded Treasury securities for terms equal to the expected term of the options.

Retirement Savings Plan

We have a 401(k) Savings Plan ("Savings Plan") which qualifies as a thrift plan under Section 401(k) of the Internal Revenue Code. All full-time U.S. employees are eligible to participate in the Savings Plan after 90 days from the date of hire. Employees may elect to reduce their current compensation by up to the statutory prescribed annual limit and have the amount of such reduction contributed to the 401(k) Plan. We provide matching to employee contributions up to 4% of the employees' base pay if employees contribute at least 6% of their base pay. If the contribution rate is less than 6% of the base pay, the matching percentage is prorated. Our contributions to the 401(k) retirement savings plans were $125,000, $115,000 and $110,000 for the years ended December 31, 2015, 2014 and 2013, respectively.

Note 12. Guarantees

Indemnification Agreements

We have entered into indemnification agreements with our directors and officers that require us to indemnify our directors and officers against liabilities that may arise by reason of their status or service as directors or officers, other than liabilities arising from willful misconduct of a culpable nature; to advance their expenses incurred as a result of any proceeding against them as to which they could be indemnified; and to obtain directors' and officers' insurance if available on reasonable terms, which we currently have in place.

Product Warranty

We provide warranties for our products for a specific period of time, generally twelve months, against material defects. We provide for the estimated future costs of warranty obligations in cost of sales when the related revenue is recognized. The accrued warranty costs represent the best estimate at the time of sale of the total costs that we expect to incur to repair or replace product parts that fail while still under warranty. The amount of accrued estimated warranty costs are primarily based on historical experience as to product failures as well as current information on repair costs. On a quarterly basis, we review the accrued balances and update the historical warranty cost trends. The following table reflects the change in our warranty accrual which is included in "accrued liabilities" on the consolidated balance sheets, during 2015 and 2014 (in thousands):

	Year Ended December 31,	
	2015	2014
Beginning accrued warranty and related costs	$ 802	$ 1,048
Accruals for warranties issued	662	865
Adjustments related to pre-existing warranties including expirations and changes in estimates	(238)	(467)
Cost of warranty repair	(729)	(644)
Ending accrued warranty and related costs	$ 497	$ 802

Note 13. Income Taxes

Consolidated income before provision for income taxes includes non-U.S. income of approximately $15.2 million, $12.8 million and $16.7 million for the years ended December 31, 2015, 2014 and 2013, respectively. We

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recorded a current tax provision of $531,000, $215,000 and $188,000 for the years ended December 31, 2015, 2014 and 2013, respectively. The components of the provision (benefit) for income taxes are summarized below (in thousands):

	Year Ended December 31,		
	2015	2014	2013
Current:			
Federal	$ —	$ —	$ —
State	2	2	13
Foreign	529	213	175
Total current	531	215	188
Deferred:			
Federal	—	—	—
State	—	—	—
Total deferred	—	—	—
Total net provision for income taxes	$ 531	$ 215	$ 188

A reconciliation of the effective income tax rates and the U.S. statutory federal income tax rate is summarized below:

	Year Ended December 31,		
	2015	2014	2013
Statutory federal income tax rate	35.0 %	35.0 %	35.0 %
State income taxes, net of federal tax benefits	—	(0.2)	(0.1)
Change in valuation allowance	(209.4)	(695.8)	(111.8)
Stock-based compensation	(6.5)	(26.3)	(1.4)
Foreign rate differences	213.8	758.6	85.3
Dividend from PRC investee	(57.8)	(169.8)	(19.6)
Net loss from privately-held PRC investments	1.1	45.6	2.5
Other	(0.1)	14.4	7.3
Effective tax rate	(23.9) %	(38.5) %	(2.8) %

Deferred tax assets and liabilities are summarized below (in thousands):

	As of December 31,	
	2015	2014
Deferred tax assets:		
Net operating loss	$ 60,538	$ 55,654
Accruals and reserves not yet deductible	3,723	4,517
Credits	1,488	1,488
	65,749	61,659
Deferred tax liabilities:		
Valuation of investment portfolio	—	—
	—	—

Net deferred tax assets	65,749	61,659
Valuation allowance	(65,749)	(61,659)
Net deferred tax assets	$ —	$ —

As of December 31, 2015, we have federal and state net operating loss carryforwards of approximately $179.8 million and $1.7 million, respectively, which will expire beginning in 2022 and 2017, respectively. In addition, we have federal tax credit carryforwards of approximately $1.5 million, which will expire beginning in 2019.

The deferred tax assets valuation allowance as of December 31, 2015 is attributed to U.S. federal, and state deferred tax assets, which result primarily from future deductible accruals, reserves, net operating loss carryforwards, and tax credit carryforwards. We believe that, based on a number of factors, the available objective evidence creates

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sufficient uncertainty regarding the realizability of the deferred tax assets such that a full valuation allowance has been recorded. These factors include our history of losses related to domestic operations, and the lack of carryback capacity to realize deferred tax assets. The valuation allowance increased by $4.1 million and increased by $3.7 million for the years ended December 31, 2015 and 2014, respectively.

Our consolidated subsidiaries in China have enjoyed various tax holidays since 2000. Benefits under the tax holidays vary by jurisdiction.

In accordance with Section 382 of the Internal Revenue Code, the amounts of and benefits from net operating loss and tax credit carryforwards may be impaired or limited in certain circumstances. Events which cause limitations in the amount of net operating losses or credits that we may utilize in any one year include, but are not limited to, a cumulative ownership change of more than 50% as defined, over a three year period.

During fiscal year 2015, the amount of gross unrecognized tax benefits decreased by $1.8 million. The total amount of unrecognized tax benefits was $14.6 million as of December 31, 2015. The Company recognizes interest and penalties related to uncertain tax positions as part of the income tax provision. To date, such interest and penalties have not been material.

We recognize interest and penalties related to uncertain tax positions in income tax expense. Income tax expense for the year ended December 31, 2015 includes no interest and penalties. As of December 31, 2015, we have no accrued interest and penalties related to uncertain tax positions.

We file income tax returns in the U.S. federal, various states and foreign jurisdictions. We have substantially concluded all U.S. federal and state income tax matters through December 31, 2001.

Deferred tax liabilities have not been recognized for $80.5 million of undistributed earnings of our foreign subsidiaries at December 31, 2015. We have made no provision for U.S. income taxes on undistributed earnings of certain foreign subsidiaries because it is our intention to permanently reinvest such earnings in its foreign subsidiaries. If such earnings were distributed, we would be subject to additional U.S. income tax expense. Determination of the amount of unrecognized deferred income tax liability related to these earnings is not practicable. As of December 31, 2015, we and our consolidated joint ventures held approximately $22.3 million in cash and investments in foreign bank accounts. This consists of $16.8 million held by our wholly owned subsidiary in China and $5.5 million held by our three partially-owned consolidated subsidiaries in China. Of this $22.3 million, approximately $15.9 million would not be available for use in the United States without paying United States income taxes.

A reconciliation of the beginning and ending amount of the gross unrecognized tax benefits is as follows (in thousands):

Gross unrecognized tax benefits balance as of December 31, 2014	$ 16,403
Add:	
Additions based on tax positions related to the current year	—
Additions for tax positions of prior years	—
Less:	
Decrease related to lapse of statute of limitations	(1,846)
Gross unrecognized tax benefits balance as of December 31, 2015	$ 14,557

Excluding the effects of recorded valuation allowances for deferred tax assets, $14.6 million of the unrecognized tax benefit would favorably impact the effective tax rate in future periods if recognized.

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Note 14. Net Income per Share

A reconciliation of the numerators and denominators of the basic and diluted net income per share calculations is as follows (in thousands, except per share data):

	Year ended December 31,		
	2015	2014	2013
Numerator:			
Net loss attributable to AXT, Inc	$ (2,228)	$ (1,388)	$ (7,958)
Less: Preferred stock dividends	(177)	(177)	(177)
Net loss available to common stockholders	$ (2,405)	$ (1,565)	$ (8,135)
Denominator:			
Denominator for basic net loss per share - weighted average common shares	32,183	32,452	32,700
Effect of dilutive securities:			
Common stock options	—	—	—
Restricted stock awards	—	—	—
Denominator for dilutive net loss per common shares	32,183	32,452	32,700
Basic net loss per share:			
Net income attributable to AXT, Inc	$ (0.07)	$ (0.05)	$ (0.25)
Net income to common stockholders	$ (0.07)	$ (0.05)	$ (0.25)
Diluted net loss per share:			
Net income attributable to AXT, Inc	$ (0.07)	$ (0.05)	$ (0.25)
Net income to common stockholders	$ (0.07)	$ (0.05)	$ (0.25)
Options excluded from diluted net loss per share as the impact is anti-dilutive	3,779	2,772	2,671
Restricted stock excluded from diluted net loss per share as the impact is anti-dilutive	546	252	241

Note 15. Segment Information and Foreign Operations

Segment Information

We operate in one segment for the design, development, manufacture and distribution of high-performance compound semiconductor substrates and sale of materials. In accordance with ASC topic 280, Segment Reporting, our chief operating decision maker has been identified as the Chief Executive Officer, who reviews operating results to make decisions about allocating resources and assessing performance for the Company. Since we operate in one segment, all financial segment and product line information can be found in the consolidated financial statements.

Geographical Information

The following table represents revenue amounts (in thousands) reported for products shipped to customers in the corresponding geographic region:

	Year Ended December 31,		
	2015	2014	2013
Europe (primarily Germany)	$ 19,518	$ 21,535	$ 21,387
Taiwan	13,799	11,464	10,131
China	13,728	17,451	24,946
Asia Pacific (excluding China, Taiwan and Japan)	11,482	11,207	9,165
North America (primarily the United States)	9,837	10,292	10,665
Japan	9,138	11,550	9,041
Total	$ 77,502	$ 83,499	$ 85,335

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Long-lived assets consist primarily of property, plant and equipment, and are attributed to the geographic location in which they are located. Long-lived assets, net of depreciation, by geographic region were as follows (in thousands):

	As of December 31,	
	2015	2014
Long-lived assets by geographic region:		
North America	$ 542	$ 136
China	30,880	33,726
	$ 31,422	$ 33,862

Note 16. Other Income (expense)

The components of other income (expense) are summarized below (in thousands):

	Year Ended December 31,		
	2015	2014	2013
Foreign exchange gain (loss)	$ 717	$ (999)	$ (1,253)
Gain on sales of investments	859	1,263	—
Other income (expense)	447	97	505
	$ 2,023	$ 361	$ (748)

Foreign Exchange Contracts and Transaction Gains/Losses

Transaction gains and losses resulting from transactions denominated in currencies other than the U.S. dollar or in the functional currencies of our subsidiaries are included in “other income (expense), net” for the periods presented. The transaction gains for the year ended December 31, 2015 totaled $717,000 and the transaction losses for the years ended December 31, 2014 and 2013 totaled $1.0 million and $1.3 million, respectively.

To partially protect us against fluctuations in foreign currency resulting from accounts receivable in Japanese yen from our Japanese customers, starting in 2015, we instituted a foreign currency hedging program. We place short term hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted on the consolidated balance sheet and classified as Level 3 assets and liabilities. As of December 31, 2015 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results. As of December 31, 2015, our outstanding commitments with respect to foreign exchange contracts were $36,000. As of

December 31, 2014, we had no outstanding commitments with respect to foreign exchange contracts.

Gain on Sales of Investments

Gain on sales investments were derived from the realized gain from the sales of our IntelliEpi common stock, an available-for-sales investment, in the Taiwan stock exchange market in year ended December 31, 2015 and 2014. As of December 31, 2015, we no longer hold any IntelliEpi stock.

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Note 17. Commitments and Contingencies

Legal Matters

We are subject to legal proceedings and claims, either asserted or unasserted, that arise in the ordinary course of business. While the outcome of these proceedings and claims cannot be predicted with certainty, management does not believe that the outcome of any of these legal matters will have a material adverse effect on our consolidated financial position, results of operations or cash flows.

Leases

We lease certain office space, warehouse facilities and equipment under long-term operating leases expiring at various dates through December 2025. The majority of our lease obligations relates to our lease agreement for the facility in Fremont, California with approximately 19,467 square feet. Total rent expenses under these operating leases were $313,000, $260,000 and $638,000 for the years ended December 31, 2015, 2014 and 2013, respectively. Total minimum lease payments under these leases as of December 31, 2015 are summarized below (in thousands):

	Lease Payments
2016	$ 173
2017	167
2018	39
2019	30
2020	27
Thereafter	97
	$ 533

Royalty Agreement

We entered into a royalty agreement with a competitor effective December 3, 2010 with a term of eight years, terminating December 31, 2018. We and our related companies are granted a worldwide, nonexclusive, royalty bearing, irrevocable license to certain patents for the term on the agreement. We shall pay up to $7.0 million royalty payment over eight years that began in 2011 based on future royalty bearing sales. This agreement contains a clause that allows us to claim a credit, starting in 2013, in the event that the royalty bearing sales for the year is lower than a pre-determined amount set forth in this agreement. Royalty expense under this agreement was $583,000 which was net of claim for credit of $217,000 for the year ended December 31, 2015. Royalty expense for years ended December 31, 2014 and 2013 were $577,000 which was net of claim for credit of $223,000 and $530,000 which was net of claim for credit of $270,000, respectively. These expenses were included in cost of revenue. Total maximum, remaining royalty payments under this agreement as of December 31, 2015 are summarized below (in thousands):

	Royalty Payments
2016	$ 575
2017	575
2018	575
	$ 1,725

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Note 18. Unaudited Quarterly Consolidated Financial Data

	Quarter			
	First	Second	Third	Fourth
	(in thousands, except per share data)			
2015:				
Revenue	$ 20,064	$ 21,010	$ 18,371	$ 18,057
Gross profit	4,749	4,385	4,605	3,090
Net income (loss) attributable to AXT, Inc	(1,024)	(3)	42	(1,243)
Net (loss) attributable to AXT, Inc per share, basic	$ (0.03)	$ (0.00)	$ (0.00) *	$ (0.04)
Net (loss) attributable to AXT, Inc per share, diluted	$ (0.03)	$ (0.00)	$ (0.00) *	$ (0.04)
2014:				
Revenue	$ 19,345	$ 21,449	$ 23,138	$ 19,567
Gross profit	2,718	4,160	5,318	4,971
Net (loss) attributable to AXT, Inc	(2,040)	319	644	(311)
Net (loss) attributable to AXT, Inc per share, basic	$ (0.06)	$ 0.01	$ 0.02	$ (0.01)
Net (loss) attributable to AXT, Inc per share, diluted	$ (0.06)	$ 0.01	$ 0.02	$ (0.01)

* Net loss to AXT, Inc. per common share resulted due to the accrual of preferred dividend liquidation preference during the three months ended September 30, 2015.

Note 19. Restructuring Charges

On February 25, 2014, we announced a restructuring plan with respect to our wholly-owned subsidiary, Beijing Tongmei Xtal Technology Co, Ltd. (“Tongmei”) in order to better align manufacturing capacity with demand. Under the restructuring plan, Tongmei implemented certain workforce reductions with respect to its manufacturing facility in China. We also announced that the restructuring plan would be completed by March 31, 2014, depending on local legal requirements. In the first quarter of 2014, we reduced the workforce at Tongmei by approximately 93 positions that were no longer required to support production and operations, or approximately 11 percent of the workforce. Accordingly, we recorded a restructuring charge of approximately $907,000 related to the reduction in force for severance-related expenses. As of March 31, 2014, we completed this restructuring plan and the reduction in force. We had no restructuring charges in 2015.

Note 20. Whistleblower Complaint and Investigation

On February 23, 2015, the Board of Directors announced that, pursuant to an anonymous whistleblower complaint, our Audit Committee conducted an investigation of certain potential related-party transactions involving Davis Zhang, our former President, China Operations. The investigation did not conclude that there was any intentional misconduct by Mr. Zhang, or that he received any improper benefit from these transactions. Further, the investigation did not reveal any inaccuracies in our financial statements resulting from these transactions. However, the investigation identified certain historical related-party transactions that were not previously disclosed in our filings with the Securities and Exchange Commission ("SEC"). We have filed a Current Report on Form 8-K with the SEC on February 23, 2015 to disclose such historical related-party transactions.

On February 20, 2015, the Board waived any potential inconsistencies with our Code of Conduct and Ethics arising from the transactions identified in the investigation. Also, the Audit Committee approved the related-party nature of such transactions to the extent it had not previously approved such transactions. The Board and Audit Committee specified that such waiver and approval would have retroactive effect to the date of commencement of the transactions covered by such waiver and approval. We have incurred approximately $1.8 million of professional service fees during the course of this investigation.

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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, thereto duly authorized.

AXT, Inc.

By: /s/ GARY L. FISCHER
Chief Financial Officer and Corporate Secretary
(Principal Financial Officer)

Date: March 11, 2016

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Morris S. Young and Gary L. Fischer, and each of them, his true and lawful attorney-in-fact and agent, with full power of substitution, each with power to act alone, to sign and execute on behalf of the undersigned any and all amendments to this Report on Form 10-K, and to perform any acts necessary in order to file the same, with all exhibits thereto and other documents in connection therewith with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requested and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or their or his or her substitutes, shall 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 and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ MORRIS S. YOUNG Morris S. Young	Chief Executive Officer and Director (Principal Executive Officer)	March 11, 2016
/s/ GARY L. FISCHER Gary L. Fischer	Chief Financial Officer and Corporate Secretary (Principal Financial Officer and Principal Accounting Officer)	March 11, 2016
/s/ JESSE CHEN Jesse Chen	Chairman of the Board of Directors	March 11, 2016
/s/ DAVID C. CHANG David C. Chang	Director	March 11, 2016
/s/ LEONARD LEBLANC Leonard LeBlanc	Director	March 11, 2016

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AXT, Inc.

EXHIBITS

TO

FORM 10-K ANNUAL REPORT

For the Year Ended December 31, 2015

Exhibit Number	Description
3.1(1)	Restated Certificate of Incorporation
3.2(2)	Certificate of Amendment of Certificate of Incorporation
3.3(3)	Certificate of Amendment to the Restated Certificate of Incorporation
3.4(4)	Certificate of Designation, Preferences and Rights of Series A Preferred Stock (which is incorporated herein by reference to Exhibit 2.1 to the registrant's form 8-K dated May 28, 1999).
3.5(5)	Second Amended and Restated By Laws
3.6(6)	Amended and Restated Section 5.1 of Article V of the Second Amended and Restated Bylaws of AXT, Inc.
3.7(7)	Certificate of Amendment to By Laws
4.1(8)	Rights Agreement dated April 24, 2001 by and between AXT, Inc. and ComputerShare Trust Company, Inc.
10.1(9)*	Form of Indemnification Agreement for directors and officers
10.2(10)*	1997 Stock Option Plan and forms of agreements thereunder
10.3(11)	Purchase and Sale Agreement by and between Limar Realty Corp #23 and AXT, Inc. dated April 1998
10.4(12)	Bond Purchase Contract between Dain Rauscher Incorporated and AXT, Inc. dated December 1, 1998
10.5(13)	Remarketing Agreement between Dain Rauscher Incorporated and AXT, Inc. dated December 1, 1998
10.6(14)	Reimbursement Agreement between Wells Fargo Bank National Association and AXT, Inc. dated April 7, 2003
10.7(15)	Asset purchase agreements dated September 4, 2003 by and between Dalian Luming Science and Technology Group, Ltd and AXT, Inc. and by and between Lumei Optoelectronics Corp., AXT, Inc., Lyte Optronics, Inc., Beijing Tongmei Xtal Technology and Xiamen Advanced Semiconductor Co., Ltd.
10.8(16)*	Agreement respecting severance payment between the Company and Dr. Morris S. Young.
10.9(17)	Purchase and Sale Agreement by and between Car West Auto Body, Inc., a California corporation and AXT, Inc. dated February 19, 2008
10.10(18)	Lease agreement dated July 2, 2008 between AXT, Inc. and T. Drive Partners, L.P., a California partnership
10.11(19)**	6-inch Supply Agreement dated December 31, 2008 between AXT, Inc. and IQE plc
10.12(20)**	4-inch Supply Agreement dated December 31, 2008 between AXT, Inc. and IQE plc
10.13(21)	2007 Equity Incentive Plan (amended December 8, 2008)
10.14(22)*	Forms of agreements under the 2007 Equity Incentive Plan
10.15(23)*	Employment Letter Agreement between the Company and Mr. Robert G. Ochrym
10.16(24)**	

	Supply Agreement signed January 29, 2010 between AXT, Inc. and AZUR SPACE Solar Power GmbH
10.17(25)	Credit Line Account Application and Agreement for Organizations and Businesses between AXT, Inc. and UBS Bank USA dated December 15, 2008
10.18(26)	Notice of Credit Line Account Increase between AXT, Inc. and UBS Bank USA dated January 17, 2012
10.19(27)*	Amended and Restated Employment Offer Letter between the Company and Dr. Morris S. Young dated December 4, 2012
10.20(28)*	Employment Letter Agreement between the Company and Mr. Gary L. Fischer
10.21(29)*	2015 Equity Incentive Plan
10.22(30)*	Executive Incentive Plan
12.1	Computation of Ratio of Earnings to Fixed Charges

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21.1	List of Subsidiaries
23.1	Consent of Independent Registered Public Accounting Firm, Burr Pilger Mayer, Inc
24.1	Power of Attorney (see signature page)
31.1	Certification by principal executive officer pursuant to Section 302 of the Sarbanes Oxley Act of 2002
31.2	Certification by principal financial officer pursuant to Section 302 of the Sarbanes Oxley Act of 2002
32.1	Certification by Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as adopted Pursuant to Section 906 of the Sarbanes Oxley Act of 2002
32.2	Certification by Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as adopted Pursuant to Section 906 of the Sarbanes Oxley Act of 2002
101.INS†	XBRL Instance.
101.SCH†	XBRL Taxonomy Extension Schema.
101.CAL†	XBRL Taxonomy Extension Calculation Linkbase.
101.DEF†	XBRL Taxonomy Extension Definition Linkbase.
101.LAB†	XBRL Taxonomy Extension Label Linkbase.
101.PRE†	XBRL Taxonomy Extension Presentation Linkbase.

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(1) Incorporated by reference to exhibit 3.1 to registrant's Form 10-K filed with the SEC on March 31, 1999.
(2) Incorporated by reference to exhibit 3.1 to registrant's Form 10-Q filed with the SEC on August 14, 2000.
(3) Incorporated by reference to exhibit 3.4 to registrant's Form 10-Q filed with SEC on August 5, 2004.
(4) Incorporated by reference to exhibit 3.1 to registrant's Form 8-K filed with the SEC on June 14, 1999.
(5) Incorporated by reference to exhibit 3.4 to registrant's Form 8-K filed with the SEC on May 30, 2001.
(6) Incorporated by reference to exhibit 99.2 to registrant's Form 8-K filed with the SEC on August 1, 2007.
(7) Incorporated by reference to exhibit 3.1 to registrant's Form 8-K filed with the SEC on October 26, 2010.
(8) Incorporated by reference to exhibit 4.2 to registrant's Form 8-K filed with the SEC on May 30, 2001.
(9) Incorporated by reference to exhibit 10.1 to registrant's Form 8-K filed with the SEC on October 31, 2014.
(10) Incorporated by reference to exhibit 10.3 to registrant's Registration Statement on Form S-1 filed with the SEC on March 17, 1998.
(11) Incorporated by reference to exhibit 10.7 to registrant's Registration Statement on Amendment No. 2 to Form S-1 filed with the SEC on May 11, 1998.
(12) Incorporated by reference to exhibit 10.10 to registrant's Form 10-K filed with the SEC on March 31, 1999.
(13) Incorporated by reference to exhibit 10.11 to registrant's Form 10-K filed with the SEC on March 31, 1999.
(14) Incorporated by reference to exhibit 10.15 to registrant's Form 10-Q filed with the SEC on May 9, 2003.
(15) Incorporated by reference to exhibit 10.16 to registrant's Form 10-Q filed with the SEC on November 13, 2003.
(16) Incorporated by reference to exhibit 99.1 to registrant's Form 8-K filed with the SEC on March 30, 2005.
(17) Incorporated by reference to exhibit 10.25 to registrant's Form 8-K filed with the SEC on February 20, 2008.
(18) Incorporated by reference to exhibit 10.28 to registrant's Form 8-K filed with the SEC on July 8, 2008.
(19) Incorporated by reference to exhibit 10.29 to registrant's Form 8-K filed with the SEC on January 5, 2009.
(20) Incorporated by reference to exhibit 10.30 to registrant's Form 8-K filed with the SEC on January 5, 2009.
(21) Incorporated by reference to exhibit 10.31 to registrant's Form 10-K filed with the SEC on March 31, 2009.
(22) Incorporated by reference to exhibit 10.20 to registrant's Form 10-K filed with the SEC on March 22, 2010.
(23) Incorporated by reference to exhibit 10.24 to registrant's Form 10-K filed with the SEC on March 22, 2010.
(24) Incorporated by reference to exhibit 10.31 to registrant's Form 8-K filed with the SEC on February 2, 2010.
(25) Incorporated by reference to exhibit 10.23 to registrant's Form 10-K filed with the SEC on March 15, 2012.
(26) Incorporated by reference to exhibit 10.24 to registrant's Form 10-K filed with the SEC on March 15, 2012.
(27) Incorporated by reference to exhibit 10.1 to registrant's Form 8-K filed with the SEC on December 4, 2012.
(28) Incorporated by reference to exhibit 10.1 to registrant's Form 8-K filed with the SEC on August 12, 2014.
(29) Incorporated by reference to appendix A to the registrant's Definitive Proxy Statement on Schedule 14A filed with the SEC on April 8, 2015.

(30) Incorporated by reference to exhibit 10.1 to registrant's Form 8-K filed with the SEC on February 26, 2016.

*Management contract or compensatory plan.

**Confidential treatment has been requested of the SEC for portions of the exhibit.

†XBRL (Extensible Business Reporting Language) information is furnished and not filed or a part of a registration statement or prospectus for purposes of sections 11 or 12 of the Securities Act of 1933, is deemed not filed for purposes of section 18 of the Securities Exchange Act of 1934, and is otherwise not subject to liability under these sections.