

AXT INC
Form 10-K
March 15, 2012

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, 2011

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
(State or other jurisdiction of
incorporation or organization)
4281 Technology Drive, Fremont, California
(Address of principal executive offices)

94-3031310
(I.R.S. Employer
Identification No.)
94538
(Zip Code)

Registrant's telephone number, including area code: (510) 683-5900

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 par value	The NASDAQ Stock Market LLC

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 of 1933.
Yes ☐ No ☒

Indicate by checkmark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934.
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

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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). x Yes o 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. x

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):

Large accelerated filer o	Accelerated filer x	Non-accelerated filer o	Smaller reporting company o
		(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). o Yes x No

The aggregate market value of the voting stock held by non-affiliates of the registrant, based upon the closing sale price of \$8.48 for the common stock on June 30, 2011 as reported on the Nasdaq Global Market, was approximately \$208,003,000. 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 2, 2012, 32,321,687 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 2012 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 regarding our business, financial condition, results of operations and prospects. Words such as “expects,” “anticipates,” “intends,” “plans,” “believes,” “seeks,” “estimates” 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 industry trends, customer demand, the development of new products, enhancements or technologies, sales levels, expense levels, planned investments and other statements regarding matters that are not historical are forward-looking statements.

Although forward-looking statements in this Annual Report reflect the good faith judgment of our management, such statements can only be based on facts and factors currently known by us. Consequently, forward-looking statements are inherently subject to risks and uncertainties and actual results and outcomes may differ materially from the results and outcomes discussed in or anticipated by the forward-looking statements. Factors that could cause or contribute to such differences in results and outcomes include without limitation those discussed under the heading “Risk Factors” in Item 1A below, as well as those discussed elsewhere in this Annual Report. Readers are urged not to place undue reliance on these forward-looking statements, which speak only as of the date of this Annual Report. We undertake no obligation to revise or update any forward-looking statements in order to reflect any event or circumstance that may arise after the date of this Annual Report. Readers are urged to carefully review and consider the various disclosures made in this Annual Report, which attempt to advise interested parties of the risks and factors that may affect our business, financial condition, results of operations and prospects.

Item 1. Business

AXT, Inc. (“AXT”, “we,” “us,” and “our” refer to AXT, Inc. and all of its subsidiaries) is a leading worldwide developer and producer of high-performance compound and single element semiconductor substrates, including substrates made from gallium arsenide (GaAs), indium phosphide (InP) and germanium (Ge). We currently sell the following substrate products in the sizes and for the applications indicated:

Substrates	Substrate Diameter	Applications
GaAs (semi-insulating)	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)	2”, 3”, 4”	High brightness light emitting diodes Lasers Optical couplers
InP	2”, 3”, 4”	Broadband and fiber optic communications
Ge	2”, 4”, 6”	Satellite and terrestrial solar cells Optical applications

We manufacture all of our semiconductor substrates using our proprietary vertical gradient freeze (VGF) technology. Most of our revenue is from sales of GaAs substrates. 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. We also have joint ventures in China which provide us pricing advantages, reliable supply and enhanced sourcing lead-times for key raw materials that are central to our final manufactured products. These joint ventures produce products including 99.99% pure gallium (4N Ga), high purity gallium, arsenic, germanium, germanium dioxide, paralytic boron nitride (pBN) crucibles and boron oxide (B₂O₃). Our ownership interest in these entities ranges from 25% to 83%. We consolidate, for accounting purposes, the joint ventures in which we have a majority or controlling financial interest and employ equity accounting for the joint ventures in which we have a smaller ownership interest. We purchase portions of the materials produced by these ventures for our own use and the joint ventures sell the remainder of their production to third parties. We use our direct sales force in the United States and China, and independent sales representatives in Europe and Asia, to market our substrates. Our ten largest customers for 2011 were: AZUR Space Solar Power GmbH, Beijing China Crystal Technology, Ltd., the IQE group, Nan Da Guang Dang, Osram Opto Semiconductors GmbH, Shin-Etsu Handoutai Co., Ltd., Sumika Electronic Materials, Inc, Sumitomo Chemical Co., Ltd., TianJin Sanan Optoelectronics Co. Ltd. and Visual Photonics Epitaxy Co. We believe that, as the demand for compound semiconductor substrates increase, we are well positioned to leverage our PRC-based manufacturing capabilities and access to favorably priced raw materials to increase our market share.

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Positive industry trends in the wireless device, LED and solar cell markets, as well as healthy demand for our products and continued advantages in our manufacturing cost structure give us confidence in our ability to continue to drive positive results in our business in 2012. Our qualification efforts in both gallium arsenide and germanium substrates have been successful and we are pleased with our increasing diversification in these areas. While the volatile business and financial markets are prompting us to continue to take a conservative approach to our business, we remain optimistic about our business.

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) 683-5900.

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, power amplifiers and radio frequency integrated circuits for wireless handsets and other wireless devices 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 are also used for automotive panels, signage, display and lighting applications. InP is a high performance semiconductor substrate used in broadband and fiber optic applications. Ge substrates are used in emerging applications such as solar cells for space and terrestrial photovoltaic applications.

Our business and operating results depend in significant part upon capital expenditures of semiconductor designers and manufacturers, which in turn depend upon the current and anticipated market demand for products incorporating semiconductors from these designers and manufacturers. Our business also depends in part on worldwide economic conditions. The severe recession in the United States and in other key international economies in previous years have decreased market demand for products incorporating semiconductors, but we began to see improvement in the demand environment for our products worldwide in the second half of 2009 that contributed to our strengthening revenue results. During 2010, one of the most interesting areas was the growth of smart phones and other sophisticated Internet-connected devices, such as tablets and netbooks that supported more advanced features and access to new web-based applications and services. In addition to improving sales of these products, the benefit to AXT from the sales of more feature-rich, sophisticated devices was that they required greater gallium arsenide content in order to meet the speed and functionality requirements that consumers have come to expect. Although our business experienced some fluctuation of customers' demand in the wireless market in 2011, we believe there continues to be areas of opportunity for our business in the long term.

As we move into 2012, we expect that the demand for gallium arsenide product will be driven by the proliferation of wireless-enabled devices and the increasing rollout of 3G and 4G smartphones that support substantially faster download speeds. This network upgrade enables full performance capability of the video, gaming and Internet browsing capabilities of these next generation handsets and wireless devices and is driving increases in wireless subscribers in major geographic areas around the world as well as a compelling upgrade cycle for new devices.

The LED market has experienced growth in 2011 in a broad range of applications, such as backlighting, signage, general illumination and automotive. LED-based products are becoming increasingly common as the technology offers benefits in terms of cost, efficiency and performance over older technologies. AXT has historically focused its efforts in the high-end market and while we plan to continue to do so, we are also exploring opportunities to

participate in the higher-volume, lower-end market as well. To date, this market has been geared towards novelty products and has therefore been very margin constrained. However, we believe that this market is also providing the entry into general illumination applications, as these applications will need lower cost LED devices in order to gain critical mass. Industry leaders have been making significant product development noted by the declining selling prices of LED-based light bulbs and we believe it will be important to have a presence in this market as it develops.

The concentrator photovoltaic (CPV) market for germanium also continued to grow in 2011, albeit from a smaller base. We expect growth in the global solar industry in 2012 as there is increasing interest in the replacement of fossil fuel resources with sustainable alternatives such as solar power and solar modules and a renewed interest in renewable energy technology, particularly in the United States, Europe, Asia and the Middle East. At the same time, we believe that improvements in conversion efficiency for germanium are occurring, which we believe will enable this technology to become more affordable and therefore, more widely utilized, in the future.

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The AXT Advantage

We believe that we benefit from the following advantages:

Low-cost manufacturing operation in the PRC. Since 2004, we have manufactured all of our products in China, which generally has favorable costs for facilities and labor compared to comparable facilities in the United States or Europe. As of December 31, 2011, approximately 1,284 of our 1,308 employees (including employees at our consolidated joint ventures) are in China. Our primary competitors have their major manufacturing operations in Germany or Japan and have limited manufacturing operations starting in China.

Favorable access to raw materials. Our joint ventures in China provide us favorable pricing, reliable supply and shorter lead-times for raw materials central to our final manufactured products. These materials include gallium, arsenic, germanium, germanium dioxide, paralytic boron nitride crucibles and boron oxide. As a result, we believe that our joint ventures will enable us to meet potential increases in demand from our customers by providing a more stable supply of raw materials at lower prices.

Flexible manufacturing infrastructure. Our total manufacturing space in China is approximately 190,000 square feet which we currently use for wafer processing. We believe that our competitors typically purchase crystal growing furnaces from original equipment manufacturers. In contrast, we design and build our own VGF crystal growing furnaces, which we believe should allow us to increase our production capacity more quickly and cost effectively.

Given these advantages, when the worldwide economies continued to improve in 2011 after the recovery from the worldwide recession, we experienced increased demand for our compound semiconductor substrates. We believe that we are well positioned to leverage our PRC-based manufacturing capabilities and access to favorably priced raw materials to increase our revenue and market share.

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:

Continue to provide customers high and consistent quality products and service. We seek to improve our manufacturing processes continually in order to meet and exceed our customers' high product quality standards, ensure on-time delivery of our products and optimize the cost of ownership. We expect to continue to improve our manufacturing processes in 2012 by adding new facilities, some additional equipment, automating additional processes, and streamlining performance. In addition, we plan to continue to enhance our support functions, including service and applications engineering.

Increase market share. We intend to leverage our product quality, competitive pricing and lead times both to establish relationships with new customers and to increase our market share with current customers in the integrated circuits for wireless devices and HBLED markets.

Flexible capacity to meet customers' increasing demand for substrates. Since 2006, we have tripled our 6-inch semi-insulating gallium arsenide substrate capacity in order to scale with increasing demand. As we enter 2012, we are continuing to see increasing demand for all sizes of our GaAs substrates and are reviewing our GaAs substrate capacity in order to make appropriate adjustments.

In January 2012, we agreed with the Administrative Commission of Tianjin Economy and Technology Development Zone to establish a second manufacturing facility in Tianjin, China. The arrangement provides us with land use rights for approximately 32 acres of industrial land located in Yixian Scientific and Industrial Park to construct a compound semiconductor substrate manufacturing facility that would be completed in phases by 2017. We have committed to invest \$12.5 million in the first phase of the construction of the facility and have an understanding with our BoYu joint venture that it will commit the RMB 32.0 million, or approximately \$5.0 million, that is anticipated to be required for the portion of the project devoted to crystal support, in exchange for land use rights, enterprise and individual income tax rebates, employee hiring and development subsidies, and other benefits.

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Establish leadership in emerging substrate applications. We intend to expand our served markets by exploring new opportunities for our substrates and we continue to work with our customers to enhance our substrate product offering. We have worked on the development of a 6" Ge substrate because the larger usable area in a 6-inch wafer over a 4-inch wafer will substantially reduce the cost of Ge solar cell manufacturing, which we believe is essential for commercial adoption of Ge solar cell technology for terrestrial applications.

In 2011, we continued to experience a noticeable increase in demand for our Ge substrates due to improving economic conditions as well as new customer qualifications. As a result, we increased our Ge substrate capacity in 2011 and will closely follow future demand increases and adjust our production capacity accordingly.

Technology enhancements. We continue to focus on technology development in the areas of VGF technology enhancement. We are working to increase the VGF ingot length and improve our single crystal yield rate. We also continue to work to improve our wafer processing technologies to give us better yield, lower production costs and better quality and performance for our customers.

Technology

There are basically three technologies for crystal growth in our business: Vertical Gradient Freeze (VGF), Liquid Encapsulated Czochralski (LEC), and Czochralski (CZ). Our core technologies include our proprietary VGF technique used to produce high-quality crystals that are processed into compound substrates, and the technologies of our joint venture companies, which enable us to manufacture a range of products that are used in the manufacture of compound semiconductor substrates or can be sold as raw materials to third parties.

Our VGF technique is designed to control the crystal-growth process with minimal temperature variation and is the current technique we use to produce our GaAs, InP and Ge substrates. Unlike traditional techniques, our VGF technique places the hot compound melt above the cool crystal, and minimizes the temperature gradient between the crystal and the melt which reduces the turbulence at the interface of the melt and the solid crystal. In comparison, in the LEC technique the melt and crystal are inverted, there is a higher temperature gradient between the melt and the crystal, and more turbulence at the interface of the melt and solid crystal. These aspects of the VGF technique enable us to grow crystals that have a relatively low defect density and high uniformity. The crystal and the resulting substrate are mechanically strong, resulting in lower breakage rates during a customer's manufacturing process. Since the temperature gradient is controlled electronically rather than by physical movement, the sensitive crystal is not disturbed as it may be during some competitors' VGF-like growth processes. In addition, the melt and growing crystal are contained in a closed chamber, which isolates the crystal from the outside environment to reduce potential contamination. This substrate isolation allows for more precise control of the gallium-to-arsenic ratio, resulting in better consistency and uniformity of the crystals.

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Our VGF technique offers several benefits for producing our GaAs substrates when compared to traditional crystal growing technologies. The Horizontal Bridgman (HB) technique is the traditional method for producing semi-conducting GaAs substrates for opto-electronic applications, but because of the techniques used to hold the GaAs melt, the HB technique cannot be used cost-effectively to produce substrates greater than three inches in diameter. In addition, the HB technique houses the GaAs melt in a quartz container during the growth process, which can contaminate the GaAs melt with silicon impurities, making it unsuitable for producing semi-insulating GaAs substrates.

Our VGF technique also offers advantages over the LEC technique for producing semi-insulating GaAs substrates for wireless applications. Unlike the VGF technique, the LEC technique can result in greater turbulence in the melt, and at a temperature gradient that is significantly higher than the VGF technique, which can cause LEC-grown crystals to have a higher dislocation density than VGF-grown crystals, resulting in a higher rate of breakage during the device manufacturing process. However, the LEC technique can be useful for GaAs semi-conducting substrates since the LED application specifications and requirements are less stringent than those of wireless applications.

Products

We design, develop, manufacture and distribute high-performance semiconductor substrates. We make semi-insulating GaAs substrates used in applications such as amplifiers and switches for wireless devices, and semi-conducting GaAs substrates used to create opto-electronic products including HBLEDs, which are often used to backlight wireless handsets and LCD TVs and for automotive, signage, display and lighting applications. InP is a high-performance semiconductor substrate used in broadband and fiber optic 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:

Product	Applications	
	Electronic	Opto-electronic
GaAs	Cellular phones	LEDs
	Direct broadcast television	Lasers
	High-performance transistors	Optical couplers
	Satellite communications	
InP	Fiber optic communications	Lasers
	Satellite communications	
	High-performance transistors	
	Automotive collision avoidance radar	
Ge	Satellite and terrestrial solar cells	Optical applications

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

Materials. We participate in joint ventures in China that sell raw materials used by us in substrate manufacturing and by others. These joint ventures produce products including 99.99% pure gallium (4N Ga), high purity gallium, arsenic, and germanium, germanium dioxide, paralytic boron nitride (pBN) crucibles, and boron oxide (B₂O₃). In 2011 and 2010, sales of raw materials by these joint ventures to third parties were approximately \$23.6 million and \$14.9

million, respectively.

The primary costs of manufacturing compound semiconductor substrates are labor, raw materials and manufacturing equipment such as crystal growing furnaces. Accordingly, substrate manufacturers, including AXT, are continuing to shift production to larger wafers to reduce manufacturing costs.

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Customers

We sell our compound semiconductor substrates and materials worldwide. Our top ten revenue producing customers in 2011 by revenue in alphabetical order were:

AZUR Space Solar Power GmbH Shin-Etsu Handoutai Co., Ltd.
Beijing China Crystal Technology, Ltd. Sumika Electronic Materials Co., Ltd.
IQE Group Sumitomo Chemical Co., Ltd.
Nan Da Guang Dang TianJin Sanan Optoelectronics Co., Ltd.
Osram Opto Semiconductors GmbH Visual Photonics Epitaxy Co.

Historically, we have sold a significant portion of our products in any particular period to a limited number of customers. IQE Group (IQE, Inc., IQE RF, LLC, IQE (Europe) Limited, MBE Technology Pte. Ltd., Wafer Technology Ltd.) represented approximately 18% of our revenue for the year ended December 31, 2011. One customer represented 19% of the revenue for the year ended December 31, 2010, and one customer represented 15% of the revenue for the year ended December 31, 2009. Our top five customers represented 35% of our revenue for the year ended December 31, 2011, 40% of our revenue for the year ended December 31, 2010, and 41% of our revenue for the year ended December 31, 2009. We expect that sales to a small number of customers will continue to comprise a significant portion of our revenue in the future.

There were two third party customers for the raw materials revenue from our joint ventures that accounted for 15% and 13% of the revenue from raw materials sales for the year ended December 31, 2011, two third party customers for our raw materials revenue that accounted for 21% and 19% of the revenue from raw materials sales for the year ended December 31, 2010, and three third party customers for our raw materials that accounted for 18%, 13% and 11% of the revenue from raw materials sales for the year ended December 31, 2009. Our joint ventures are a key strategic benefit for us as they give us a strong competitive advantage of allowing our customers to work with one supplier for their substrate and raw material requirements. Our raw materials customers include chemical companies. Additionally, we sell raw materials to some of the competitors to our substrate business.

Manufacturing, Raw Materials and Supplies

We believe that our operating results reflect our manufacturing efficiency and high product yields and we continually emphasize quality and process control throughout our manufacturing operations. We manufacture all of our products at our facilities in Beijing, China, which generally has favorable costs for facilities and labor compared to our previous manufacturing in the United States. We believe that our capital investment and subsequent operating costs are lower for our manufacturing facilities in China relative to the previous facilities in the United States. Although some of our manufacturing operations are fully automated and computer monitored or controlled, enhancing reliability and yield, we expect to continue to improve our processes and increase the number of automated processes in 2012. We use proprietary equipment in our substrate manufacturing operations to protect our intellectual property and control the timing and pace of capacity additions. All of our manufacturing facilities are ISO 9001 or 9002 certified. In January 2006, our Beijing facility successfully passed the ISO 14001 certification audit.

We have joint ventures in China that provide us favorable pricing, reliable supply and shorter lead-times for raw materials central to our manufactured products including gallium, arsenic, germanium, germanium dioxide, pyrolitic boron nitride crucibles, and boron oxide. We believe that these joint ventures have been and will continue to be advantageous in allowing us to procure materials to support our planned growth and cost management goals. 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 these materials through standard

purchase orders and not pursuant to long-term supply contracts. 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, such as gallium.

Sales and Marketing

We advertise in trade publications, distribute promotional materials, conduct marketing and sales programs, and participate in industry trade shows and conferences in order to raise market awareness of our products.

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We sell our substrate products directly to customers through our direct salesforce in the U.S. and through independent sales representatives in France, Germany, Japan, South Korea, Taiwan and the United Kingdom. Our direct salesforce is knowledgeable in the use of compound and single-element substrates. Our applications engineers work with customers during all stages of the substrate manufacturing process, from developing the precise composition of the substrate through manufacturing to 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.

International Sales. International sales are an important part of our business. Sales to customers outside North America (primarily United States) accounted for 80% of our revenue in 2011, 78% of our revenue in 2010, and 81% of our revenue in 2009. The primary markets for sales of our substrate products outside of the United States are to customers located in Asia and Western Europe.

We also sell through our joint ventures raw materials including 4N, 5N, 6N, 7N and 8N gallium, boron oxide, germanium, arsenic, germanium dioxide, paralytic boron nitride crucibles used in crystal growth and parts for MBE (Molecular Beam Epitaxy). Our joint ventures are a key strategic benefit for us as they give us a strong competitive advantage by allowing our customers to work with one supplier for all their substrate and raw material requirements. Our joint ventures have their own separate salesforce where they also sell directly to their own customers in addition to their supply of 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 and reducing manufacturing costs. We have assembled a multi-disciplinary team of skilled scientists, engineers and technicians to meet our research and development objectives.

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. During 2011 and 2010, we continued to focus research and development resources to reduce surface quality problems we experienced with our GaAs and InP substrates for some customers, particularly related to surface morphology. Although some major problems related to surface quality have been resolved, we still need to continue to improve in this area and expect that this effort in research and development will continue in 2012. In 2011, one of our joint ventures continued to work on research and development projects to qualify for a government incentive program for reduced future tax rates in China. It will continue this effort in the future. We focus our research and development effort to utilize more of our VGF technique to produce high-purity gallium.

Research and development expenses were \$2.5 million in 2011, compared with \$2.3 million in 2010 and \$1.6 million in 2009. We expect our rate of expenditure on research and development costs in 2012 to remain constant as we continue to improve on our processes. Our joint ventures will continue their effort in research and development.

Competition

The semiconductor substrate industry is characterized by rapid technological change and price erosion, as well as intense foreign and domestic 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 domestic and international companies who 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 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;

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performance;

capacity;

meeting customer specifications; and

customer support and satisfaction.

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 and product features by us and our competitors;

the availability of adequate sources of raw materials;

protection of our products by effective use of intellectual property laws; and

general economic conditions.

A compound semiconductor substrate customer typically has two or three substrate suppliers that it has qualified for the production of its products. These 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 customers' current lead times or that a customer perceives will not be able to meet future demand and provide consistent quality can lose current market share. Our primary competition in the market for compound semiconductor substrates includes Freiberger Compound Materials, Hitachi Cable, and Sumitomo Electric Industries. 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 compound semiconductor device manufacturers that produce substrates for their own internal use, including Hitachi, and from companies such as TriQuint Semiconductors that are actively developing alternative compound semiconductor materials.

We believe we are the only compound semiconductor substrate supplier to offer a full suite of raw materials and we believe that this gives us a strong competitive advantage in our marketplace.

Protection of our Intellectual Property

Our success and the competitive position of our VGF technique depend on our ability to maintain 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 fifteen (15) patents that relate to our VGF products and processes, three (3) in the U.S., two (2) in Japan, eight (8) in China, one (1) in Canada, and one (1) in Korea, which expire in 2016 (1 U.S.), 2017 (1 JP), 2018 (1 CN), 2020 (2 CN), 2021 (1 JP, 5 CN), 2022 (1 U.S., 1 CA, 1 KR), 2027 (1 U.S.). We have nine (9) U.S.

patent applications pending and thirty-two (32) foreign patent applications pending (including applications in Patent Cooperation Treaty (“PCT”) and national stage processes) in Europe, Canada, China, Japan and Taiwan, which are based on our US patents and/or pertain to our VGF-related wafer manufacturing processes.

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.

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Environmental Regulations

We are subject to federal, state and local environmental laws and regulations, including laws in China as well as the U.S. 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 clean-up efforts, personal injury and fines or suspension or cessation of our operations.

Employees

As of December 31, 2011, we had 1,308 employees, of whom 1,014 were principally engaged in manufacturing, 137 in sales and administration, and 157 in research and development. Of these employees, 24 were located in the United States and 1,284 in China. As of December 31, 2010, we had 1,302 employees, of whom 1,034 were principally engaged in manufacturing, 129 in sales and administration, and 139 in research and development. Of these employees, 25 were located in the United States and 1,277 in China.

As of December 31, 2011, 1,130 employees in China 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) 683-5900. The public may read and copy any material we file with the Securities and Exchange Commission, or SEC, at the SEC’s Public Reference Room at 100 F Street, N.E., Washington D.C., 20549. The public may obtain information on the operations of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC maintains an Internet site <http://www.sec.gov> that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC.

Our web site is www.axt.com. We make available, free of charge, on or through our web site, our annual, quarterly and current reports, and any amendments to those reports as soon as reasonably practicable after those reports are filed with the SEC. The information on our web site does not constitute a part of this Annual Report on Form 10-K and is not incorporated herein.

Item 1A. Risk Factors

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

Risks related to our general business;

Risks related to international aspects of our business;

Risks related to our financial results and capital structure;

Risks related to our intellectual property; and

Risks related to compliance and other legal matters.

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Risks Related to Our General Business

Ongoing 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. For example, our business and operating results were significantly impacted by the global economic downturn in 2009 due to the effects of the credit market crisis, slower economic activity and a generally negative economic outlook, a decrease in consumer and business confidence and liquidity concerns, as well as concerns over U.S. government debt. Global market and economic conditions continue to be uncertain and volatile. The possible duration and severity of this adverse economic cycle is unknown. Although we remain well-capitalized and have not suffered any liquidity issues as a result of those events, the cost and availability of funds may be adversely affected by illiquid credit markets. Continued 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, such as financial services; and

impairment of our intangible or other assets.

We have experienced and expect to continue to experience delays in customer purchasing decisions or disruptions in normal volume of customer orders that we believe are 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. To the extent that the current economic downturn worsens or persists, or any of the above risks occur, our business and operating results could be significantly and adversely affected.

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 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. On average, we have experienced average selling price declines over the course of the last twelve months of anywhere from approximately 5% to 20% per year depending on the product. It is also possible for the pace of average selling price declines to 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 current difficult economic 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.

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.

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Shifts in our product mix may result in declines in gross margins.

Our gross profit margins vary among our product families, and are generally higher on our larger diameter wafers. In addition, historically our gross margins have been higher on our raw materials sales. Accordingly, our overall gross margins have 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 and our ability to reduce product costs, and these fluctuations are expected to continue in the future.

We do not control the prices at which our joint venture companies sell their raw materials products to third parties. However, as 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 joint venture 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 such an event, our gross margin may be adversely impacted. In addition, one of our joint venture companies 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.

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. We have experienced these conditions in our business for most of 2011 especially for GaAs substrate, and may experience widespread and possibly more severe and prolonged downturns in the future as a result of such cyclical changes. 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 of 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.

Our industry has in the past experienced periods of oversupply that result in significantly reduced demand and prices for compound semiconductor devices and components, including our products, both as a result of general economic changes and overcapacity. When these periods occur and our operating results and financial condition are adversely affected, oversupply creates pressure on our revenue, gross margins and net income. Inventory buildups in telecommunications products and slower than expected sales of computer equipment resulted in overcapacity and led to reduced sales by our customers, and therefore reduced purchases of our products. During periods of weak demand such as those experienced historically, customers typically reduce purchases, delay delivery of products and/or cancel orders of component parts such as our products. Increased price competition has resulted, causing pressure on our net sales, gross margin and net income. We experienced cancellations, price reductions, delays and push-outs of orders,

which have resulted in reduced revenue. If the economic downturn continues, 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 expenses is relatively fixed in the short term. 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 that quarter.

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

A small number of substrate customers have historically accounted for a substantial portion of our total revenue. For the year ended December 31, 2011, IQE Group represented 18% of our revenue, compared to 19% in the year ended December 31, 2010. Our top five customers represented 35% of revenue for the year ended December 31, 2011, 40% of revenue for the year ended December 31, 2010, and 41% of revenue for the year ended December 31, 2009. We expect that a significant portion of our future revenue will continue 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, 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.

We depend on high utilization of our manufacturing capacity.

An important factor in our success is the extent to which we are able to utilize the available capacity in our Beijing facility. As many of our costs are fixed, a reduction in capacity utilization, as well as changes in other factors such as reduced yield or unfavorable product mix, could reduce our profit margins and adversely affect our operating results. 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.

The Chinese Government has previously imposed manufacturing restrictions that, if imposed again in the future on our facilities, could materially and adversely impact our results of operations and our financial condition.

The Chinese government has in the past imposed restrictions on manufacturing facilities, such as the restrictions imposed on polluting factories for the 2008 Olympics and Paralympics, including a shut-down of transportation of materials and power plants to reduce air pollution. If, in the future, restrictions are imposed on our operations, our ability to meet customer demand or supply current or new orders would be significantly impacted. Customers could then be required to purchase product from our competitors, causing our competitors to take market share from us, and could result in our customers supplying future needs from our competitors. Restrictions on transportation of materials could limit our ability to transport our product, and could result in bottlenecks at shipping ports, limiting 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, such as occurred during 2008. Any of these restrictions could materially and adversely impact our results of operations and our financial condition.

Defects in our products could diminish demand for our products.

Our products are complex and may contain defects. We have experienced quality control problems with many of our products, which caused customers to return products to us, reduce orders for our products, or both. Although our quality has improved, resulting in some increases in product sales, we believe that we continue to experience some reduction in orders as a result of our prior product quality problems. If we continue to 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, 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.

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

We must manage our inventory of component parts, work-in-process and finished goods effectively to meet changing customer requirements, while keeping inventory costs down and improving gross margins. 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. Furthermore, if current costs of production increase or sales prices drop below the standard prices at which we value inventory, we may need to take a charge for a reduction in inventory values. 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.

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

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;
- substrate breakage;
- equipment failure, power outages or variations in the manufacturing process; and
- performance of personnel involved in the manufacturing process.

If our yields decrease, our revenue could decline if we are unable to produce needed product on time. 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. In particular, many of our manufacturing processes are new and are still being refined, which can result in lower yields.

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.

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 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 because 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 three years, we have seen our competitors selling more substrates manufactured using a crystal growth technology similar to ours, which has eroded our technological differentiation. Other companies, including TriQuint Semiconductors, are actively developing substrate materials that could be used to manufacture devices that could provide the same high-performance, low-power capabilities as GaAs- and InP-based devices at competitive prices. If these substrate materials or VGF-derived products are successfully developed and semiconductor device manufacturers adopt them, demand for our GaAs substrates could decline and our revenue could suffer.

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.

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

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The markets for our products are intensely competitive. We face competition for our substrate products from other manufacturers of substrates, such as Freiburger Compound Materials, Hitachi Cable and Sumitomo Electric, from semiconductor device manufacturers that produce substrates for their own use, and from companies, such as TriQuint Semiconductors, that are actively developing alternative materials to GaAs and 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 technique. Other competitors may develop and begin using similar technology. If we are unable to compete effectively, our revenue may not increase and we may be unable to remain profitable. We face many competitors that have a number of significant advantages over us, including:

greater experience in the business;

more manufacturing experience;

extensive intellectual property;

broader name recognition; 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 year and we expect competition to continue to increase in the future. Competitive pressures caused by the current economic conditions 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 small crystal growing company established by a former employee in China that is supplying ingots to the market. While new competitors such as this company currently do not appear to be fully competitive, competition from sources such as this could increase, particularly if these competitors are able to obtain large capital investments.

Demand for our products may decrease if our customers experience difficulty manufacturing, marketing or selling their products.

Our products are used as components in our customers' products. Accordingly, demand for our products is subject to factors affecting the ability of our customers to introduce and market their products successfully, including:

the competition our customers face in their particular industries;

the technical, manufacturing, sales and marketing and management capabilities of our customers;

the financial and other resources of our customers; and

the inability of our customers 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 our customers are unable to develop, market and sell their products, demand for our products will decrease.

Current 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 and may be depressed for the foreseeable future. Uncertainties in the financial and credit markets have caused our customers to postpone deliveries of ordered systems and placement of new orders. Continued 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 our sales are primarily to major corporate customers 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 the current market conditions continue to deteriorate, we may experience increased collection times and greater write-offs, either of which could have a material adverse effect on our cash flow.

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In addition, the 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, including 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 the economic slowdown or the timing or strength of any subsequent recovery.

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

Many of our customers are facing business downturns that have reduced their cash balances and their prospects. We frequently allow our customers extended payment terms after 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 when due, we will be required to incur charges that would reduce our earnings.

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 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 raw material 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.

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 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. These affiliates each have a market beyond that provided by us. We do not have influence over all of these companies, each of which is located in China, 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.

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

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 budgeting, 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 vary. In addition, if a customer decides not to incorporate our products into its initial design, we may not have another opportunity to sell products to this customer for many months or even years. In the current competitive and economic climate, the average 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.

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Problems incurred by our joint ventures or venture partners could result in a material adverse impact on our financial condition or results of operations.

We have invested in joint venture operations in China that produce products including 99.99% pure gallium (4N Ga), high purity gallium, arsenic, germanium, germanium dioxide, paralytic boron nitride (pBN) crucibles and boron oxide (B₂O₃). We purchase a portion of the materials produced by these ventures for our use and sell the remainder of their production to third parties. Our ownership interest in these entities ranges from 25% to 83%. We consolidate the joint ventures in which we have a majority or controlling financial interest and employ equity accounting for the joint ventures in which we have a smaller ownership interest. Several of these joint ventures 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, disruptions of our joint venture operations could result, having a material adverse effect on the financial condition and results of operation of our joint ventures, and correspondingly on our financial condition or results of operations. For example, since gallium is a by-product of aluminum, our 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 by-product services provided by the aluminum plant. Accordingly, in order to meet customer supply obligations, our joint venture may have to source finished products 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.

We believe that continuing to invest in additional joint ventures will be important to remaining competitive in our marketplace and ensuring a supply of critical raw materials. However, we may not be able to identify 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.

Since all of our joint venture activity is expected to occur in China, these 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 export the venture products 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

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nationalization of foreign-owned assets, including intellectual property.

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

The United States continues 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 U.S. 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, and a significant portion of our customers are located outside of the United States, terrorist activity or threats against U.S.-owned enterprise are a particular concern to us.

If any of our facilities is 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 situation 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.

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 retain, 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.

Risks Related to International Aspects of Our Business

Changes in tariffs, import restrictions, export restrictions 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, or unexpected changes in regulatory requirements, any of which could reduce our gross margins. For example, in 2006, tax authorities in the PRC changed the treatment of refunds of value-added taxes that companies pay when they purchase certain raw materials, including gallium and arsenic. The cumulative effect is that our PRC joint venture companies no longer receive a refund of value-added tax for exports of gallium or arsenic, including certain shipments to our wholly-owned PRC subsidiary that are treated as exports under PRC tax regulations. Given the relatively fluid regulatory environment in the PRC, 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. Accordingly, we continue to seek customer qualification of our China-manufactured products. In addition, 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 customers allocated their requirements for compound semiconductor substrates across more of our competitors. If we are unable to continue to achieve customer qualifications for our products, or if continue to experience quality problems, customers may not increase purchases of our products, our China facility will become underutilized, and we will be unable to achieve expected revenue growth. In addition, we have recently entered into an arrangement to establish a second manufacturing facility in China, which when complete will further our reliance on Chinese manufacturing facilities. We may again lose sales of our products to competitors and experience loss of market share. If we are unable to recover and retain our market share, we may be unable to grow our business.

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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 80%, 78% and 81% our total revenue for the years ended December 31, 2011, 2010 and 2009, respectively. We expect that sales to customers outside the United States, particularly sales to customers in Asia, will continue to represent a significant portion of our revenue.

Currently, a significant percentage of our sales is to customers headquartered in Asia. All of our manufacturing facilities and some of our suppliers are also located outside the U.S. 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 and where we anticipate significant opportunity for growth. 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; and (v) 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 Japanese customers which are denominated in Japanese yen. Thus, 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.

Also, denominating some sales in Japanese yen subjects us to fluctuations in the exchange rates between the U.S. dollar and the Japanese yen. The functional currency of our Chinese subsidiary and joint ventures is the local currency. We incur transaction gains or losses resulting from consolidation of expenses incurred in local currencies for these entities, as well as in translation of the assets and liabilities of their assets at each balance sheet date. If we do not effectively manage the risks associated with international sales, our revenue, cash flows and financial condition could be adversely affected.

If there are power shortages in the PRC, 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, the Chinese government has faced a power shortage resulting in power demand outstripping supply in peak periods. Instability in electrical supply in past years has caused sporadic outages among residential and commercial consumers causing the Chinese government to implement tough measures to ease the energy shortage, and as a result, we closed most of our operations for a week in late July 2004 in conformance with this policy.

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In 2006 we were able to switch the electrical supply for our manufacturing facility onto the same power grid as that used by vital PRC government services such as hospitals and police. However, if even despite this switch, further problems with power shortages occur in the future, and we are required to make temporary closures 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 customers could suffer, impacting our ability to generate future revenue. In addition, if power is shut off at our Beijing subsidiary 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 expense that will not be covered by revenue, and negatively impacting our cost of revenue and gross margins.

Changes in China's political, social and economic environment may affect our financial performance.

Our financial performance may be affected by changes in China's political, social and economic environment. 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 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 license for 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 in China.

An outbreak of contagious disease such as 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, 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 Asia 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.

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 our contractions successfully we may draw down our cash reserves, which would adversely affect our operating results and 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 be required 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.

If we are not able to fund our capital commitments to expand our facilities in China, our business and operating results may be adversely affected.

We and one of our joint ventures expect to invest up to approximately \$17.5 million in capital projects at our China facilities, including the second manufacturing facility in Tianjin, in 2012 and 2013 to expand our manufacturing capabilities to optimize the utilization of our resources. If we are unable to fund these projects due to an unexpected decrease in our cash reserves or an inability to raise additional funds, our business and operating results may be materially adversely impacted.

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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 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;

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 made;

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 in the short term, 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 be below the expectations of market analysts or investors, which could also cause our stock price to fall.

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 for future periods. 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.

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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.

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:

662/3% 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.

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. For example, we have

in the past been involved in lawsuits alleging patent infringement, and could in the future be involved in similar litigation.

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

We rely on a combination of patents, copyrights, trademark 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. 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 technique. 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.

Risks Related to Compliance and Other Legal Matters

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

The shift of our manufacturing operations to China and growth of our business has placed and continues to place a significant strain on our operations and management resources. We have upgraded our inventory control systems, but continue to rely on certain manual processes in our operations and in connection with consolidation of our financial results. If we fail to manage a transition from manual processes to automated processes effectively, our operations may be disrupted.

To manage our business effectively, we may need to implement additional and improved 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 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.

We have in the past been the subject of claims made by the California Occupational Safety and Health Administration in an investigation primarily regarding impermissible levels of potentially hazardous materials in certain areas of our manufacturing facility in Fremont, California. We were also previously the target of press allegations and correspondence purportedly on behalf of current and/or former employees concerning our environmental compliance programs and exposure of our employees to hazardous materials in California. In addition, a complaint was previously filed against us and two current officers, 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 put 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.

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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 February 28, 2012 are as follows:

Location	Square Feet	Principal Use	Ownership
Fremont, CA	27,760	Administration	Operating lease, expires November 2015
Beijing, China	33,000	Production	Owned
Beijing, China	34,000	Production	Owned
Beijing, China	48,000	Production	Owned
Beijing, China	22,000	Production and Administration	Owned
Beijing, China	53,000	Production	Owned
Xianxi, China	56,500	Production	Owned by Beijing Ji Ya Semiconductor Material, Co., Ltd.*
Xianxi, China	7,500	Administration	Owned by Beijing Ji Ya Semiconductor Material, Co., Ltd.*
Beijing, China	2,000	Administration	Operating lease by Beijing Ji Ya Semiconductor Material, Co., Ltd., expires February 2014
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	7,600	Production and Administration	Operating leases by Bo Yu Semiconductor Vessel Craftwork Technology Co., Ltd., expire in various terms until March 2014

*Joint ventures in which we hold an interest. We hold a 46% interest in Beijing Ji Ya 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 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
2011		
First Quarter	\$12.23	\$5.65
Second Quarter	\$8.90	\$5.85
Third Quarter	\$9.24	\$4.98
Fourth Quarter	\$5.97	\$3.63
2010		
First Quarter	\$3.84	\$2.65
Second Quarter	\$5.20	\$3.17
Third Quarter	\$7.03	\$4.05
Fourth Quarter	\$10.74	\$6.26

As of December 31, 2011, there were 77 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 December 31, 2011 and 2010, respectively, 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.

Issuer Purchases of Equity Securities

During the years ended December 31, 2011 and 2010, we did not repurchase any shares of our common stock.

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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, 2006, and ending December 31, 2011.

	12/06	12/07	12/08	12/09	12/10	12/11
AXT, Inc.	\$ 100.00	\$ 131.36	\$ 28.60	\$ 68.86	\$ 221.19	\$ 88.35
NASDAQ Composite	\$ 100.00	\$ 110.26	\$ 65.65	\$ 95.19	\$ 112.10	\$ 110.81
NASDAQ Electronic Components	\$ 100.00	\$ 117.33	\$ 60.16	\$ 96.77	\$ 110.84	\$ 99.75

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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.

		Years Ended December 31,				
	2011	2010	2009	2008	2007	
		(in thousands, except per share data)				
Statements of Operations Data:						
Revenue	\$104,121	\$95,493	\$55,364	\$73,075	\$58,203	
Cost of revenue	59,339	58,998	41,495	55,115	37,942	
Gross profit	44,782	36,495	13,869	17,960	20,261	
Operating expenses:						
Selling, general, and administrative	14,836	13,972	13,389	15,751	13,746	
Research and development	2,473	2,339	1,569	2,164	1,699	
Impairment (recovery of impairment) on assets held for sale	—	—	—	83	(481)	
Restructuring charge	—	—	507	—	—	
Total operating expenses	17,309	16,311	15,465	17,998	14,964	
Income (loss) from operations	27,473	20,184	(1,596)	(38)	5,297	
Interest income, net	449	53	177	513	704	
Other income, net	696	2,462	385	1,290	1,912	
Income (loss) before provision for income taxes	28,618	22,699	(1,034)	1,765	7,913	
Provision for income taxes	2,795	2,323	471	1,023	728	
Net income (loss)	25,823	20,376	(1,505)	742	7,185	
Less: Net income attributable to noncontrolling interest						
	5,503	1,723	393	1,431	1,896	
Net income (loss) attributable to AXT, Inc.	\$20,320	\$18,653	\$(1,898)	\$(689)	\$5,289	
Net income (loss) attributable to AXT, Inc. per common share:						
Basic	\$0.63	\$0.60	\$(0.07)	\$(0.03)	\$0.17	
Diluted	\$0.61	\$0.57	\$(0.07)	\$(0.03)	\$0.16	
Shares used in per share calculations:						
Basic	31,872	31,008	30,500	30,400	30,035	
Diluted	33,061	32,512	30,500	30,400	31,348	

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	2011	2010	December 31, 2009 (in thousands)	2008	2007
Balance Sheet Data:					
Cash and cash equivalents	\$26,156	\$23,724	\$16,934	\$13,566	\$18,380
Investments	14,486	17,251	18,469	17,756	20,825
Working capital	92,220	82,116	70,681	66,836	75,350
Restricted deposits	—	—	—	3,013	6,700
Total assets	162,488	140,251	107,946	111,662	112,772
Long-term debt, net of current portion	—	—	420	496	6,250
Stockholders' equity	147,049	119,804	97,251	96,876	96,986

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.

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. A critical accounting policy is one that is both material to the presentation of our consolidated financial statements and requires us to make difficult, subjective or complex judgments that could have a material impact on our consolidated financial statements and results of operations. Different estimates that we could have used, or changes in the estimates that are reasonably likely to occur, may have a material impact on our financial condition or results of operations. We also refer you to our "The Company and Summary of Significant Accounting Policies" discussed in the accompanying notes to our consolidated financial statements included elsewhere in this Form 10-K.

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, 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 signed 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.

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Accounts Receivable and Allowance for Doubtful Accounts

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 in excess of 90 days and for receivables from customers located outside the U.S. in excess of 120 days and reserve allowance on the receivable balances if needed. 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, 2011, our accounts receivable balance was \$18.0 million with no allowance for doubtful accounts. During 2011, we decreased our allowance for doubtful accounts by \$99,000 compared to the amount as of December 31, 2010 primarily for improved collections worldwide. As of December 31, 2010, our accounts receivable balance was \$23.1 million, which was net of an allowance for doubtful accounts of \$99,000. During 2010, we decreased our allowance for doubtful accounts by \$64,000 compared to the amount as of December 31, 2009 primarily for improved collections worldwide. As of December 31, 2009, our accounts receivable balance was \$15.4 million, which was net of an allowance for doubtful accounts of \$163,000. During 2009, we decreased our allowance by \$367,000 compared to the amount as of December 31, 2008 primarily for improved collections from slow-paying customers in Asia. 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 the period.

The allowance for sales returns is also deducted from gross accounts receivable. During 2011, we utilized \$367,000 and charged an additional \$29,000 resulting in the allowance for sales returns of \$124,000 as of December 31, 2011. During 2010, we utilized \$703,000 and charged an additional \$309,000 resulting in the allowance for sales returns of \$462,000 as of December 31, 2010. During 2009, we utilized \$119,000 and charged an additional \$842,000 resulting in the allowance for sales returns of \$856,000 as of December 31, 2009.

Warranty Reserve

We maintain a warranty reserve based upon our claims experience during the prior twelve months. Warranty costs are accrued at the time revenue is recognized. As of December 31, 2011 and 2010, accrued product warranties totaled \$1.0 million and \$740,000, respectively. The increase in accrued product warranties is primarily attributable to increased claims for quality issues experienced by some customers. If actual warranty costs 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.

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 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. As of December 31, 2011 and 2010, we had an inventory reserve of \$12.3 million and \$11.5 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 our 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.

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We invest in equity instruments of privately-held companies for business and strategic purposes. These investments are classified as other assets and are accounted for under the cost method as we do not have the ability to exercise significant influence over their operations. 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 2011, 2010 or 2009.

Fair Value of Investments

In the current market environment, the assessment of the fair value of investment instruments can be difficult and subjective. Although the volume of trading activity of certain investment instruments has increased in 2011, the rapid changes occurring in today's financial markets may lead to changes in the fair value of financial instruments in relatively short periods of time. 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 identical 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 similar 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 whether a market is considered active requires management judgment. Our assessment of an active market for our marketable debt instruments generally takes into consideration activity during each week of the one-month period prior to the valuation date of each individual instrument, including the number of days each individual instrument trades and the average weekly trading volume in relation to the total outstanding amount of the issued instrument.

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 most management judgment and subjectivity. As of December 31, 2011, we did not have any assets or liabilities without

observable market values that would require a high level of judgment to determine fair value (Level 3 assets).

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, 2011 and 2010.

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Stock Based Compensation

We grant options to substantially all management employees and believe that this program helps us to attract, motivate and retain high quality employees, to the ultimate benefit of our stockholders. We account for stock-based compensation in accordance with the provisions of FASB Accounting Standards Codification (“ASC”) topic 718, Stock-based Compensation (“ASC 718”), using the modified prospective method.

We utilize the Black-Scholes option pricing model to estimate the grant date fair value of employee stock compensation awards, which requires the input of highly subjective assumptions, including expected volatility and expected term. Historical volatility was used in estimating the fair value of our stock options awards, while the expected term for our options was estimated based on historical option exercise behavior and post-vesting forfeitures of options by our employees. Further, we estimate forfeitures for stock compensation awards that are not expected to vest. Changes in these inputs and assumptions can materially affect the measure of estimated fair value of our stock compensation.

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. The cost of restricted stock awards is determined using the fair value of our common stock on the date of grant. 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). All of our stock compensation is accounted for as an equity instrument.

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.

Results of Operations

Overview

We were founded in 1986 to commercialize and enhance our proprietary vertical gradient freeze (VGF) technique for producing high-performance compound semiconductor substrates. We have one operating segment: our substrate business, with limited additional raw materials sales. We recorded our first substrate sales in 1990 and our substrate division currently sells gallium arsenide (GaAs), indium phosphide (InP) and germanium (Ge) substrates to manufacturers of 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 joint ventures. During 2011, we continued to qualify our germanium substrates with satellite and terrestrial solar cell system manufacturers in the United States, Europe, Asia and the Middle East.

Continuing Operations

We manufacture all of our semiconductor substrates using our proprietary vertical gradient freeze (VGF) technology. Most of our revenue is from sales of GaAs substrates. 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 comparable facilities in the United States or Europe. We also have joint ventures in China that provide us favorable pricing, reliable supply and shorter lead-times for raw materials central to our final manufactured products.

Our business and operating results depend in significant part upon capital expenditures of semiconductor designers and manufacturers, which in turn depend upon the current and anticipated market demand for products incorporating semiconductors from these designers and manufacturers. Our business also depends in part on worldwide economic conditions. During 2011, the United States and other key international economies continued to recover from the recent economic downturn and our business has grown as a whole. Although we experienced some fluctuation in the customer demand for the GaAs substrates that are used for end-products in the wireless market, our revenues have grown in all other substrates including semi-conducting GaAs substrate, InP substrate and Ge substrate. These results reflect both strong growth in our markets as well as continued share gains and improved operational execution across our entire organization. Should the worldwide economic conditions continue to recover and customer demand becomes stable, we believe that we are well positioned to leverage our PRC-based manufacturing capabilities and access to favorably priced raw materials to increase our market share.

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Revenue

(\$ in thousands)	Years Ended Dec. 31,			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease)	% Change	Increase (Decrease)	% Change	
GaAs	\$63,697	\$67,591	\$41,054	\$ (3,894)	(5.8)%	\$26,537	64.6	%
InP	5,182	4,038	2,375	1,144	28.3	1,663	70.0	
Ge	11,635	8,955	5,440	2,680	29.9	3,515	64.6	
Raw Materials	23,606	14,884	6,440	8,722	58.6	8,444	131.1	
Other	1	25	55	(24)	(96.0)	(30)	(54.5)	
Total revenue	\$104,121	\$95,493	\$55,364	\$8,628	9.0 %	\$40,129	72.5	%

Revenue increased by \$8.6 million or 9.0%, to \$104.1 million in 2011 from \$95.5 million in 2010. Total GaAs substrate revenue decreased \$3.9 million, or 5.8%, to \$63.7 million in 2011 from \$67.6 million in 2010. The decrease in revenue was primarily due to reduced orders from a few big customers as demand fell in the wireless market.

Sales of 5 inch and 6 inch diameter GaAs substrates, which are mainly used in wireless devices, decreased by \$7.1 million to \$20.7 million in 2011 compared to \$27.8 million in 2010 primarily due to reduced orders from a few big customers as demand fell in the wireless market.

Sales of 2 inch, 3 inch and 4 inch diameter GaAs substrates, which are mainly used in LED applications, increased by \$3.2 million to \$43.0 million in 2011 compared to \$39.8 million in 2010 primarily due to increased worldwide adoption and investment in LED technology in many applications in 2011 compared to the prior year.

Revenue increased by \$40.1 million or 72.5%, to \$95.5 million in 2010 from \$55.4 million in 2009. Total GaAs substrate revenue increased \$26.5 million, or 64.6%, to \$67.6 million in 2010 from \$41.1 million in 2009. The increase in revenue was primarily due to the stronger demand environment worldwide in 2010 compared to 2009, particularly for our GaAs product. Sales of 5 inch and 6 inch diameter GaAs substrates, which are mainly used in wireless devices, increased by \$10.6 million to \$27.8 million in 2010 compared to \$17.2 million in 2009 primarily due to strong sales of wireless devices. Sales of 2 inch, 3 inch and 4 inch diameter GaAs substrates, which are mainly used in LED applications, increased by \$15.9 million to \$39.8 million in 2010 compared to \$23.9 million in 2009 primarily due to strong sales of wireless devices as well as the increasing worldwide adoption and investment in LED technology in many applications, compared to the worldwide economic slowdown we experienced in the prior year.

InP substrate revenue increased by \$1.1 million, or 28.3%, to \$5.2 million in 2011 compared to \$4.0 million in 2010 as demand from customers in the optical networking industry increased. We continued to see renewed demand for these substrates as investment in high-speed optical communications increased worldwide. InP substrate revenue increased by \$1.7 million, or 70.0%, to \$4.0 million in 2010 compared to \$2.4 million in 2009 as demand from customers in the optical networking industry increased.

Ge substrate revenue increased by \$2.7 million, or 29.9%, to \$11.6 million in 2011 from \$9.0 million in 2010. Our Ge substrate revenue increased as demand from our customers increased for satellite applications and for concentrated photovoltaic solar applications. We continued to make progress in our penetration of the solar cell market, particularly in satellite applications. Ge substrate revenue increased by \$3.5 million, or 64.6%, to \$9.0 million in 2010 from \$5.4 million in 2009. Our Ge substrate revenue increased primarily due to demand increased for concentrated photovoltaic solar applications from our German and Chinese customers.

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Raw materials revenue increased by \$8.7 million, or 58.6%, to \$23.6 million in 2011 from \$14.9 million in 2010 primarily as a result of increased demand from our new and existing customers for 4N raw gallium, as well as from increased selling prices. However, the selling price of gallium has begun to stabilize and we expect that this will affect our raw material revenue in future years. Raw materials revenue increased by \$8.4 million, or 131.1%, to \$14.9 million in 2010 from \$6.4 million in 2009 as a result of increased demand of 4N raw gallium.

Our raw materials business has increasingly become an important part of our business, as it provides us protection against raw materials pricing increases and supply constraints. Since we are able to supply raw materials necessary for the production of our substrates at favorable prices, our ability to sell such materials in the open market, at market prices, also provides us with pricing protection. We expect to continue to expand our raw materials sales efforts. However, the selling price of gallium has begun to stabilize and we expect that this will affect our raw material revenue in future years.

Revenue by Geographic Region

	Years Ended Dec. 31,						2010 to 2011		2009 to 2010	
(\$ in thousands)	2011		2010		2009		Increase (Decrease)	% Change	Increase (Decrease)	% Change
North America*	\$20,471		\$20,739		\$10,701		\$ (268)	(1.3)%	\$10,038	93.8 %
% of total revenue	20	%	22	%	19	%				
Europe	21,082		18,838		10,489		2,244	11.9	8,349	79.6
% of total revenue	20	%	20	%	19	%				
Japan	13,749		11,857		7,777		1,892	16.0	4,080	52.5
% of total revenue	13	%	12	%	14	%				
Taiwan	9,813		14,834		10,453		(5,021)	(33.8)	4,381	41.9
% of total revenue	9	%	15	%	19	%				
Asia Pacific (excluding Japan and Taiwan)	39,006		29,225		15,944		9,781	33.5	13,281	83.3
% of total revenue	38	%	31	%	29	%				
Total revenue	\$104,121		\$95,493		\$55,364		\$8,628	9.0 %	\$40,129	72.5 %

* Primarily the United States.

Sales to customers located outside of North America represented approximately 80%, 78%, and 81% of our revenue during 2011, 2010 and 2009, respectively.

Revenue from customers located in North America decreased by \$268,000, or 1.3%, to \$20.5 million in 2011 from \$20.7 million in 2010. This decrease in 2011 was due to a decrease in the demand for GaAs substrates of \$1.9 million, reflecting the slower demand in the wireless market, offset by an increase in the demand for raw materials of \$935,000 primarily from 4N raw gallium and an increase in the demand for InP substrates of \$637,000 used in the optical networking industry. Revenue from customers located in North America increased by \$10.0 million, or 93.8%, to \$20.7 million in 2010 from \$10.7 million in 2009. This increase in 2010 was due to an increase in the demand for

substrates of \$9.2 million and an increase in the demand for raw materials of \$837,000 due to the stronger demand environment compared to the economic slowdown we experienced in the prior year.

Revenue from customers located in Europe increased by \$2.2 million, or 11.9%, to \$21.1 million in 2011 from \$18.8 million in 2010. This increase was mainly from increased sales of \$2.8 million primarily of GaAs substrates, Ge substrates and 4N raw gallium to customers in Germany, increased sales of \$911,000 primarily of GaAs substrates to customers in the United Kingdom, offset by decreased sales of \$1.7 million primarily of GaAs substrates to customers in France. Revenue from customers located in Europe increased by \$8.3 million, or 79.6%, to \$18.8 million in 2010 from \$10.5 million in 2009. This increase was mainly from increased sales of \$5.6 million primarily of GaAs substrates and Ge substrates to customers in Germany, increased sales of \$1.2 million primarily of GaAs substrates to customers in France and \$1.1 million in raw materials sales to customers in Slovakia.

Revenue from customers located in Japan increased by \$1.9 million, or 16.0%, to \$13.7 million in 2011 from \$11.9 million in 2010. The increase mainly came from increased sales of semi-conducting GaAs substrates of \$3.1 million, increased raw material sales of \$1.5 million and increased sales of Ge substrates of \$246,000, offset by decreased sales of semi-insulating GaAs substrates of \$3.3 million reflecting the slower demand in wireless market. Revenue from customers in Japan increased by \$4.1 million, or 52.5%, to \$11.9 million in 2010 from \$7.8 million in 2009. The increase mainly came from increased sales of substrates of all sizes amounting to \$3.0 million and increased raw material sales of \$960,000.

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Revenue from customers in Taiwan decreased by \$5.0 million, or 33.8%, to \$9.8 million in 2011 from \$14.8 million in 2010. This decrease was mainly from decreased sales of GaAs substrates as demand for both semi-insulating and semi-conducting substrates decreased from a few big customers. Revenue from customers in Taiwan increased by \$4.4 million, or 41.9%, to \$14.8 million in 2010 from \$10.5 million in 2009. This increase was mainly from increased sales of \$3.6 million of GaAs substrates as demand for both semi-insulating and semi-conducting substrates increased.

Revenue from customers in the Asia Pacific (excluding Japan and Taiwan) increased by \$9.8 million, or 33.5%, to \$39.0 million in 2011 from \$29.2 million in 2010. The increase was mainly from increased sales of \$8.7 million to customers in the PRC due to increases primarily in demand for raw materials and all substrates and increased sales of \$1.0 million primarily from GaAs substrates to customers in Singapore and Korea. Revenue from customers in the Asia Pacific (excluding Japan and Taiwan) increased by \$13.3 million, or 83.3%, to \$29.2 million in 2010 from \$15.9 million in 2009. The increase was mainly from increased sales of \$8.1 million to customers in the PRC due to an increase primarily in demand for raw materials and substrates, and increased sales of \$4.4 million primarily from GaAs substrates to customers in Singapore.

Gross Margin

	Years Ended Dec. 31,			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease) (\$ in thousands)	% Change	Increase (Decrease)	% Change	
Gross profit	\$44,782	\$36,495	\$13,869	\$8,287	22.7	% \$22,626	163.1	%
Gross Margin %	43.0	% 38.2	% 25.1	%				

Gross margin increased to 43.0% of total revenue in 2011 from 38.2% of total revenue in 2010. Sales product mix, and process improvements in production such as longer ingots and first pass yield improvements in ingots, continued to contribute to higher gross margins, as well as raw material sales with higher gross margins due to higher gallium selling prices compared to the prior year. The 2011 quarterly trend of gross margin for the first quarter to the fourth quarter of 43.4%, 46.7%, 43.3% and 36.9%, respectively, demonstrates the high rate of absorption of manufacturing overhead with higher production volume in the earlier quarters of the year. The lower 36.9% gross margin for the fourth quarter was due to the lower rate of absorption of manufacturing overhead as a result of fluctuation of customers' orders in the wireless market towards the end of the year.

Gross margin increased to 38.2% of total revenue in 2010 from 25.1% of total revenue in 2009. Sales product mix, process improvements in production such as longer ingots and first pass yield improvements in wafers, and improved slicing methods contributed to higher gross profit for the year ended December 31, 2010. Our manufacturing facility in Beijing was operating at a higher utilization capacity in 2010 compared to the prior year, which resulted in higher absorption rates. The 2010 quarterly trend of gross margin for the first quarter to the fourth quarter of 36.1%, 36.8%, 39.3% and 39.8%, respectively, demonstrates the high rate of absorption of manufacturing overhead with higher production volume. The lower 25.1% gross margin for the year ended December 31, 2009 was primarily due to the low rate of absorption of manufacturing overhead as a result of reduced sales and hence lower production volume.

Selling, General and Administrative Expenses

	Years Ended Dec. 31,			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease) (\$ in thousands)	% Change	Increase (Decrease)	% Change	
	\$14,836	\$13,972	\$13,389	\$864	6.2	% \$583	4.4	%

Selling, general
and
administrative
expenses

% of total revenue	14.2	%	14.6	%	24.2	%
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Selling, general and administrative expenses increased \$864,000 to \$14.8 million for 2011 compared to \$14.0 million for 2010. The increase was primarily due to (i) \$606,000 higher health insurance costs in China compared to a health insurance refund received in the prior year, (ii) \$363,000 higher labor costs from annual salary increases and increased average headcount, (iii) \$323,000 higher taxes and registration expenses primarily from new business taxes levied on all foreign-owned companies in China., partially offset by (iv) \$517,000 lower selling expenses mainly due to absence of severance cost and personnel cost after the departure of one of the executive officers at the end of 2010. We expect our selling, general administrative expenses may increase in the future with rising costs of doing business in China for increasing labor costs, business taxes and utilities expenses.

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Selling, general and administrative expenses increased \$583,000 to \$14.0 million for 2010 compared to \$13.4 million for 2009. The increase was primarily due to (i) \$1.0 million higher commission and bonus accrual based on improved company performance, (ii) \$346,000 higher accounting fees for the integrated audit including the SOX audit for 2010, which was not required for 2009, (iii) \$283,000 higher legal fees incurred in fourth quarter of 2010 to conclude the royalty negotiation with Sumitomo, partially offset by (iv) \$567,000 lower legal fees as certain legal fees incurred in 2009 did not recur in 2010, and (v) \$376,000 lower severance cost.

Research and Development Expenses

	Years Ended Dec. 31,			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease)	% Change	Increase (Decrease)	% Change	
				(\$ in thousands)				
Research and development expenses	\$2,473	\$2,339	\$1,569	\$134	5.7	% \$770	49.1	%
% of total revenue	2.4	% 2.4	% 2.8	%				

Research and development expenses increased \$134,000, or 5.7%, to \$2.5 million for 2011, from \$2.3 million for 2010 primarily due to higher labor costs from increased headcount of our joint ventures in China. We expect our rate of expenditures on research and development costs in 2012 to be stable as our joint ventures continue to maintain their efforts in research and development.

Research and development expenses increased \$770,000, or 49.1%, to \$2.3 million for 2010, from \$1.6 million for 2009 mainly from increases of \$553,000 for costs relating to new product testing primarily from one of our joint ventures to possible qualification for a government incentive program to reduce future tax rates and development of 6" Germanium and increased bonus accrual of \$95,000 due to better company performance.

Interest Income, Net

	Years Ended Dec. 31,			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease)	% Change	Increase (Decrease)	% Change	
				(\$ in thousands)				
Interest income, net	\$449	\$53	\$177	\$396	747.2	% \$(124)	(70.1)	%
% of total revenue	0.4	% 0.1	% 0.3	%				

Interest income, net increased \$396,000 to \$449,000 for 2011 from \$53,000 for 2010 as a result of higher returns from various investment portfolio mixes and the absence of interest expense for the tenant improvement loan at our Fremont, U.S. offices, which was paid in full in September 2010.

Interest income, net decreased \$124,000 to \$53,000 for 2010 from \$177,000 for 2009 as a result of lower returns from various investment portfolio mixes.

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Other Income, Net and Noncontrolling Interest

	Years Ended Dec. 31,			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease)	% Change	Increase (Decrease)	% Change	
	(\$ in thousands)							
Other income, net	\$696	\$2,462	\$385	\$(1,766)	(71.7)%	\$2,077	539.5	%
% of total revenue	0.7	% 2.6	% 0.7					
Noncontrolling interest	\$5,503	\$1,723	\$393	\$3,780	219.4	\$1,330	338.4	%
% of total revenue	5.3	% 1.8	% 0.7					

Other income, net was \$696,000 for 2011 primarily due to net investment gains of \$741,000 from our minority-owned joint ventures that are not consolidated, a \$319,000 small business development fund received by our joint ventures in China, partially offset by \$316,000 withholding tax on foreign dividends from joint ventures and foreign exchange losses of \$101,000.

Other income, net was \$2.5 million for 2010 primarily due to a \$1.2 million net sales tax refund, a realized gain of \$346,000 on the sale of investments, investment gains of \$259,000 from our minority-owned joint ventures that are not consolidated, foreign exchange gain of \$614,000, partially offset by a \$109,000 tax on foreign dividends from joint ventures.

Minority interest in earnings of consolidated subsidiaries for the years ended December 31, 2011, 2010, and 2009 were \$5.5 million, \$1.7 million, and \$393,000, respectively. The increase in minority interest from 2010 to 2011 was due to improved profitability from all of our majority-owned consolidated subsidiaries which had higher sales worldwide in 2011. The increase in minority interest from 2009 to 2010 was due to improved profitability from all of our majority-owned consolidated subsidiaries which had higher sales worldwide in 2010.

Provision for Income Taxes

	Years Ended Dec. 31			2010 to 2011		2009 to 2010		
	2011	2010	2009	Increase (Decrease)	% Change	Increase (Decrease)	% Change	
	(\$ in thousands)							
Provision for income taxes	\$2,795	\$2,323	\$471	\$472	20.3	\$1,852	393.2	%
% of total revenue	2.7	% 2.4	% 0.9					

Provision for income taxes for 2011 was \$2.8 million, which was mostly related to our foreign subsidiaries. The increase in provision for income taxes from 2010 to 2011 was due to increased net income of our foreign subsidiaries as well as higher taxable income for state taxes purpose in the U.S. Besides the state taxes liabilities, no income taxes have been provided for U.S. operations due to our available federal net operating loss carryforwards.

Provision for income taxes for 2010 was \$2.3 million, which was mostly related to our foreign subsidiaries. The increase in provision for income taxes from 2009 to 2010 was due to improved profitability of our foreign subsidiaries.

Provision for income taxes for 2009 was \$471,000, which was mostly related to our foreign subsidiaries.

Due to our uncertainty regarding our future profitability, we recorded a full valuation allowance against our net deferred tax assets of \$49.6 million in 2011, \$53.1 million in 2010 and \$54.7 million in 2009.

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Liquidity and Capital Resources

	Years Ended December 31,		
	2011	2010	2009
	(\$ in thousands)		
Net cash provided by (used in):			
Operating activities	\$18,132	\$11,009	\$4,665
Investing activities	(15,430)	(5,272)	2,365
Financing activities	(999)	474	(3,692)
Effect of exchange rate changes	729	579	30
Net change in cash and cash equivalents	2,432	6,790	3,368
Cash and cash equivalents—beginning period	23,724	16,934	13,566
Cash and cash equivalents—end of period	26,156	23,724	16,934
Short and long-term investments—end of period	14,486	17,251	18,469
Total cash, cash equivalents and short-term and long-term investments	\$40,642	\$40,975	\$35,403

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. As of December 31, 2011, our principal sources of liquidity were \$40.6 million of which \$15.0 million was held by our consolidated joint ventures, consisting of cash and cash equivalents of \$26.2 million, short-term investments of \$5.5 million and long-term investments of \$9.0 million, a decrease of \$400,000 from \$41.0 million as of December 31, 2010. The \$2.4 million combined increase in cash and cash equivalents was primarily due to net cash provided by operating activities of \$18.1 million, offset by net cash used in investing activities of \$15.4 million and net cash used in financing activities of \$999,000. Short-term and long-term investments decreased by \$2.8 million to \$14.5 million from \$17.3 million.

Cash and cash equivalents and short-term and long-term investments increased \$5.6 million to \$41.0 million as of December 31, 2010 from \$35.4 million as of December 31, 2009. The \$6.8 million increase in cash and cash equivalents was primarily due to net cash provided by operating activities of \$11.0 million, and net cash provided by financing activities of \$474,000, partially offset by net cash used in investing activities of \$5.3 million. Short-term and long-term investments decreased by \$1.2 million to \$17.3 million from \$18.5 million.

Net cash provided by operating activities of \$18.1 million for 2011 was primarily comprised of our net income of \$25.8 million, adjusted for non-cash items of depreciation of \$3.4 million, stock-based compensation of \$896,000, amortization of marketable securities premium of \$368,000, a realized loss on sale of investments of \$8,000 and a net increase of \$12.4 million in assets and liabilities. The \$12.4 million net increase in assets and liabilities primarily resulted from a \$9.8 million increase in inventories, a \$4.0 million decrease in accounts payable and accrued liabilities, a \$3.3 million increase in prepaid expenses and other current assets and a \$781,000 decrease in other long-term liabilities, partially offset by a \$5.2 million decrease in accounts receivable and a \$426,000 decrease in other assets.

Net cash provided by operating activities of \$11.0 million for 2010 was primarily comprised of our net income of \$20.4 million, adjusted for non-cash items of depreciation of \$2.9 million, stock-based compensation of \$655,000, amortization of marketable securities premium of \$316,000, offset by a realized gain on sale of investments of \$346,000 and a net increase of \$12.9 million in assets and liabilities. The \$12.9 million net increase in assets and liabilities primarily resulted from a \$8.3 million increase in inventories, a \$7.7 million increase in accounts receivable, a \$5.7 million increase in other assets, a \$1.7 million increase in prepaid expenses and other current assets, partially offset by a \$5.8 million increase in other long-term liabilities, a \$3.2 million increase in accrued liabilities and a \$1.5 million increase in accounts payable.

Net cash provided by operating activities of \$4.7 million for 2009 was primarily comprised of our net loss of \$1.5 million, adjusted for non-cash items of depreciation of \$3.1 million, stock-based compensation of \$766,000, a restructuring charge of \$507,000, and a \$164,000 loss on sale of investments, partially offset by a realized gain on sale of property, plant and equipment of \$237,000, and by a net decrease of \$1.9 million in assets and liabilities. The net decrease in assets and liabilities of \$1.9 million resulted from a \$7.4 million decrease in inventories, net, a \$717,000 decrease in prepaid expenses, partially offset by a \$3.9 million increase in accounts receivable, net, a \$1.1 million decrease in accounts payable, a \$769,000 increase in other assets, a \$390,000 decrease in accrued liabilities, and a \$27,000 decrease in other long-term liabilities.

Net cash used in investing activities of \$15.4 million for the year ended December 31, 2011 was primarily from the purchase of property, plant and equipment of \$13.1 million mainly in capital projects at our China facilities, investments in new joint ventures of \$3.0 million, loans from our consolidated joint ventures to their equity investment entities of \$1.6 million offset by net proceeds from investment securities totaling \$2.2 million.

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Net cash used in investing activities of \$5.3 million for the year ended December 31, 2010 was primarily net proceeds from investment securities totaling \$1.1 million, offset by purchases of property and equipment of \$6.4 million.

Net cash provided by investing activities of \$2.4 million for the year ended December 31, 2009 included a decrease in our restricted deposits of \$3.0 million, net proceeds from investment securities totaling \$885,000, proceeds from the sale of property, plant and equipment of \$430,000, partially offset by purchases of property and equipment of \$2.0 million.

In January 2012, we have agreed with the Administrative Commission of Tianjin Economy and Technology Development Zone to establish a second manufacturing facility in Tianjin, China. The arrangement provides us with land use rights for approximately 32 acres of industrial land located in Yixian Scientific and Industrial Park to construct a compound semiconductor substrate manufacturing facility that would be completed in phases by 2017. We have committed to invest \$12.5 million in the first phase of the construction of the facility and have an understanding with our BoYu joint venture that it will commit the RMB 32.0 million, or approximately \$5.0 million, that is anticipated to be required for the portion of the project devoted to crystal support, in exchange for land use rights, enterprise and individual income tax rebates, employee hiring and development subsidies, and other benefits. The investment of \$12.5 million in one of the projects will be funded by cash flow generated by our normal operations supplemented by our existing line of credit. The investment of \$5.0 million will be funded by our BoYu joint venture.

In January 2012, we increased the credit facility line of credit maintained by us with a bank from \$3.0 million to \$10.0 million at an annual interest rate of 1.65% above the current 30-day LIBOR (London Interbank Offered Rate). As of December 31, 2011 and 2010, we had not used the \$3.0 million line of credit.

Net cash used in financing activities was \$999,000 for the year ended December 31, 2011 consisted of \$1.6 million of dividends paid by joint ventures, offset by \$637,000 from the proceeds from the exercise of employee stock options.

Net cash provided by financing activities was \$474,000 for the year ended December 31, 2010 consisted of \$1.5 million from the proceeds from the exercise of employee stock options, offset by \$496,000 long-term debt payment and \$527,000 of dividends paid by joint ventures.

Net cash used in financing activities was \$3.7 million for the year ended December 31, 2009 and consisted of \$3.1 million paying down our line of credit and long-term debt, \$1.0 million of dividends paid by joint ventures, partially offset by \$351,000 from the proceeds from the exercise of employee stock options.

We believe that we have adequate cash and investments to meet our needs over the next 12 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 at terms acceptable to us. On September 13, 2011, our registration statement on Form S-3 was declared effective by the Securities and Exchange Commission (SEC). We may from time to time offer up to \$60.0 million of common stock, preferred stock, depository shares, warrants, debt securities and/or units in one or more offerings and in any combination. We intend to use the net proceeds from any sale of securities under the shelf registration statement for general corporate purposes, which may include capital expenditures in connection with our planned expansion of our manufacturing facilities in China. The timing of any offering will be at our discretion and will depend on many factors, including the prevailing market conditions. Specific terms and share prices of any future offering under the registration statement will be established at the time of any such offering, and will be described in a prospectus supplement that we will file with the SEC.

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.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet financing arrangements and have never established any special purpose entities. We have not entered into any options on non-financial assets.

Contractual Obligations

We lease certain office space, manufacturing facilities and property under long-term operating leases expiring at various dates through November 2015. The lease agreement for the facility at Fremont, California with approximately 27,760 square feet commenced on December 1, 2008 for a term of seven years, with an option by us to cancel the lease after five years, upon forfeiture of the security deposit and payment of one-half of the fifth year's rent. Total rent expenses under these operating leases were approximately \$460,000, \$308,000, and \$298,000 for year ended December 31, 2011, 2010 and 2009, respectively.

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We entered into a royalty agreement with a vendor 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 a total of \$7.0 million royalty payment over eight years that began in 2011 based on future royalty bearing sales. Royalty expense under this agreement was \$1.3 million for the year ended December 31, 2011 and was included in cost of revenue.

The following table summarizes our contractual obligations as of December 31, 2011 (in thousands):

Contractual Obligations	Total	Payments due by period			
		Less than 1 year	1-3 years	3-5 years	More than 5 years
Operating leases	\$1,348	\$ 376	\$686	\$286	\$—
Royalty agreement	5,500	1,375	1,600	1,375	1,150
Total	\$6,848	\$ 1,751	\$2,286	\$1,661	\$1,150

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Selected Quarterly Results of Operations

The following table sets forth unaudited quarterly results for the eight quarters ended December 31, 2011. We believe that all necessary adjustments, consisting only of normal recurring adjustments, have 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							
	Dec. 31, 2011	*Sept. 30, 2011	June 30, 2011	Mar. 31, 2011	Dec. 31, 2010	Sept. 30,	June 30,	Mar. 31,
(in thousands, except for per share amounts)								