AXT INC
Form 10-Q
August 04, 2017
Table of Contents

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

(Mark One)

Quarterly report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

for the quarterly period ended June 30, 2017

Or

Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

for the transition period from to

Commission File Number 000-24085

AXT, INC.

(Exact name of registrant as specified in its charter)

DELAWARE	94-3031310
(State or other jurisdiction of Incorporation or organization)	(I.R.S. Employer Identification No.)

4281 Technology Drive, Fremont, California 94538

(Address of principal executive offices) (Zip code)

(510) 438-4700

(Registrant's telephone number, including area code)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities 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 Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	Accelerated filer
Non-accelerated filer	Smaller reporting company

(Do not check if a smaller reporting company) Emerging growth company

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).
YES NO

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

Class	Outstanding at August 1, 2017
Common Stock, $0.001 par value	38,654,643

Table of Contents

AXT, INC.

FORM 10-Q

TABLE OF CONTENTS

Table of Contents

PART I. FINANCIAL INFORMATION

Item 1. Financial Statements (unaudited)

AXT, INC.

CONDENSED CONSOLIDATED BALANCE SHEETS

(Unaudited, in thousands, except per share data)

	June 30, 2017	December 31, 2016
ASSETS		
Current assets:		
Cash and cash equivalents	$ 56,483	$ 36,152
Short-term investments	22,463	11,415
Accounts receivable, net of allowances of $819 and $1,013 as of June 30, 2017 and December 31, 2016	18,262	14,453
Inventories	40,627	40,152
Related party notes receivable – current	109	—
Prepaid expenses and other current assets	5,301	5,114
Total current assets	143,245	107,286
Long-term investments	8,578	6,156
Property, plant and equipment, net	27,945	27,805
Related party notes receivable – long-term	—	157
Other assets	12,004	12,842
Total assets	$ 191,772	$ 154,246
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 8,189	$ 6,691
Accrued liabilities	9,363	9,260
Total current liabilities	17,552	15,951
Long-term portion of royalty payments	287	575
Other long-term liabilities	220	330
Total liabilities	18,059	16,856
Commitments and contingencies (Note 12)		
Stockholders' equity:		
Preferred stock Series A, $0.001 par value; 2,000 shares authorized; 883 shares issued and outstanding as of June 30, 2017 and December 31, 2016 (Liquidation preference of $6.7 million and $6.6 million as of June 30, 2017 and December 31, 2016)	3,532	3,532

Common stock, $0.001 par value; 70,000 shares authorized; 38,655 and 33,032 shares issued and outstanding as of June 30, 2017 and December 31, 2016	39	33
Additional paid-in capital	227,539	194,177
Accumulated deficit	(62,390)	(64,985)
Accumulated other comprehensive income	1,293	253
Total AXT, Inc. stockholders' equity	170,013	133,010
Noncontrolling interests	3,700	4,380
Total stockholders' equity	173,713	137,390
Total liabilities and stockholders' equity	$ 191,772	$ 154,246

See accompanying notes to condensed consolidated financial statements.

Table of Contents

AXT, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

(Unaudited, in thousands, except per share data)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Revenue	$ 23,557	$ 20,495	$ 44,173	$ 39,208
Cost of revenue	16,301	14,468	30,629	27,928
Gross profit	7,256	6,027	13,544	11,280
Operating expenses:				
Selling, general and administrative	3,942	3,419	7,735	6,793
Research and development	1,019	1,472	2,143	2,853
Restructuring charge	—	226	—	226
Total operating expenses	4,961	5,117	9,878	9,872
Income from operations	2,295	910	3,666	1,408
Interest income, net	114	100	212	198
Equity in loss of unconsolidated joint ventures	(188)	(400)	(1,121)	(856)
Other (expense) income, net	(102)	328	(54)	518
Income before provision for income taxes	2,119	938	2,703	1,268
Provision for income taxes	321	140	480	537
Net income	1,798	798	2,223	731
Less: Net loss attributable to noncontrolling interests	132	353	372	462
Net income attributable to AXT, Inc.	$ 1,930	$ 1,151	$ 2,595	$ 1,193
Net income attributable to AXT, Inc. per common share:				
Basic	$ 0.05	$ 0.03	$ 0.07	$ 0.03
Diluted	$ 0.05	$ 0.03	$ 0.07	$ 0.03
Weighted average number of common shares outstanding:				
Basic	38,306	32,020	36,238	32,011
Diluted	39,706	32,451	37,645	32,354

See accompanying notes to condensed consolidated financial statements.

Table of Contents

AXT, INC.

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(Unaudited, in thousands)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Net income	$ 1,798	$ 798	$ 2,223	$ 731
Other comprehensive income (loss), net of tax:				
Change in foreign currency translation gain (loss), net of tax	847	(1,870)	1,322	(1,568)
Change in unrealized loss on available-for-sale investments, net of tax	(2)	(166)	(125)	(141)
Total other comprehensive income (loss), net of tax	845	(2,036)	1,197	(1,709)
Comprehensive income (loss)	2,643	(1,238)	3,420	(978)
Less: Comprehensive loss attributable to noncontrolling interests	30	568	215	633
Comprehensive income (loss) attributable to AXT, Inc.	$ 2,673	$ (670)	$ 3,635	$ (345)

See accompanying notes to condensed consolidated financial statements.

Table of Contents

AXT, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(Unaudited, in thousands)

	Six Months Ended June 30, 2017		Six Months Ended June 30, 2016	
Cash flows from operating activities:				
Net income	$ 2,223		$ 731	
Adjustments to reconcile net income to net cash provided by operating activities:				
Depreciation and amortization	2,250		2,398	
Amortization of marketable securities premium	75		62	
Impairment charge on equity investee	313		—	
Stock-based compensation	622		508	
Realized gain on sale of available-for-sale securities	(77)		(345)	
Gain on disposal of equipment	(1)		—	
Loss from equity method investments, net	808		856	
Changes in operating assets and liabilities:				
Accounts receivable	(3,683)		313	
Inventories	(119)		(947)	
Prepaid expenses and other current assets	(264)		(1,081)	
Other assets	(28)		336	
Accounts payable	1,368		1,507	
Accrued liabilities	21	*	(942)	*
Other long-term liabilities, including royalties	(302)		(426)	
Net cash provided by operating activities	3,206		2,970	
Cash flows from investing activities:				
Purchases of equipment	(1,831)		(1,695)	
Purchases of available-for-sale securities	(23,763)		(7,875)	
Proceeds from sales and maturities of available-for-sale securities	10,170		8,298	
Repayment of related party notes receivable	53		—	
Net cash used in investing activities	(15,371)		(1,272)	
Cash flows from financing activities:				
Proceeds from issuance of common stock and options exercised, net of issuance costs	32,746		2	
Dividends paid by joint ventures to their minority shareholders	(465)		(39)	
Net cash provided by (used in) financing activities	32,281		(37)	
Effect of exchange rate changes on cash and cash equivalents	215		(421)	
Net increase in cash and cash equivalents	20,331		1,240	
Cash and cash equivalents at the beginning of the period	36,152		24,875	
Cash and cash equivalents at the end of the period	$ 56,483		$ 26,115	
Supplemental disclosures:				

Income taxes paid, net of refunds	—	—

* Dividend accrued but not paid by joint ventures of $512 and $522 was included in accrued liabilities as of June 30, 2017 and June 30, 2016, respectively.

See accompanying notes to condensed consolidated financial statements.

Table of Contents

AXT, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

(Unaudited)

Note 1. Basis of Presentation

The accompanying condensed consolidated financial statements of AXT, Inc. ("AXT," the "Company," "we," "us," and "our" refer to AXT, Inc. and all of its consolidated subsidiaries) are unaudited, and have been prepared in accordance with accounting principles generally accepted in the United States of America for interim financial information and with the instructions to Form 10-Q and Article 10 of Regulation S-X. Accordingly this interim quarterly financial report does not include all disclosures required by accounting principles generally accepted in the United States of America. In the opinion of our management, the unaudited condensed consolidated financial statements reflect all adjustments, consisting only of normal recurring adjustments, considered necessary to present fairly the financial position, results of operations and cash flows of AXT and our consolidated subsidiaries for all periods presented.

Certain reclassifications have been made to prior periods' financial statements to conform to the current period presentation. These reclassifications did not result in any change in previously reported net income or total assets.

Our management has made a number of estimates and assumptions relating to the reporting of assets and liabilities and the disclosure of contingent assets and liabilities to prepare these condensed consolidated financial statements in conformity with accounting principles generally accepted in the United States of America. Actual results could differ materially from those estimates.

The results of operations for the three and six months ended June 30, 2017 are not necessarily indicative of the results to be expected in the future or for the full fiscal year. It is recommended that these condensed consolidated financial statements be read in conjunction with our consolidated financial statements and the notes thereto included in our 2016 Annual Report on Form 10-K filed with the Securities and Exchange Commission (the "SEC") on February 27, 2017 and our Quarterly Report on Form 10-Q for the three months ended March 31, 2017 filed with the SEC on May 8, 2017.

The condensed consolidated financial statements include the accounts of AXT, our wholly-owned subsidiary, Beijing Tongmei Xtal Technology Co., Ltd., and our majority-owned, or significantly controlled subsidiaries, Beijing JiYa Semiconductor Material Co., Ltd., Nanjing JinMei Gallium Co., Ltd. and Beijing BoYu Semiconductor Vessel

Craftwork Technology Co., Ltd. All significant inter company accounts and transactions have been eliminated. Investments in business entities in which we do not have controlling interests, but have the ability to exercise significant influence over operating and financial policies (generally 20-50% ownership), are accounted for by the equity method. For partially-owned subsidiaries that we consolidate, we reflect the noncontrolling interest of the portion we do not own on our condensed consolidated balance sheets in stockholders' equity and in our condensed consolidated statements of operations.

Table of Contents

Note 2. Investments and Fair Value Measurements

Our cash and cash equivalents consist of cash and instruments with original maturities of less than three months. Our investments consist of instruments with original maturities of more than three months. As of June 30, 2017 and December 31, 2016, our cash, cash equivalents and investments are classified as follows (in thousands):

	June 30, 2017				December 31, 2016			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized (Loss)	Fair Value	Amortized Cost	Gross Unrealized Gain	Gross Unrealized (Loss)	Fair Value
Classified as:								
Cash	$ 55,775	$ —	$ —	$ 55,775	$ 23,948	$ —	$ —	$ 23,948
Cash equivalents:								
Certificates of deposit 1	708	—	—	708	12,204	—	—	12,204
Total cash and cash equivalents	56,483	—	—	56,483	36,152	—	—	36,152
Investments (available-for-sale):								
Certificates of deposit 2	5,728	1	(12)	5,717	8,999	1	(20)	8,980
Corporate bonds	25,393	—	(69)	25,324	8,479	—	(47)	8,432
Corporate equity securities	—	—	—	—	48	111	—	159
Total investments	31,121	1	(81)	31,041	17,526	112	(67)	17,571
Total cash, cash equivalents and investments	$ 87,604	$ 1	$ (81)	$ 87,524	$ 53,678	$ 112	$ (67)	$ 53,723
Contractual maturities on investments:								
Due within 1 year 3	$ 22,504			$ 22,463	$ 11,325			$ 11,415
Due after 1 through 5 years 4	8,617			8,578	6,201			6,156
	$ 31,121			$ 31,041	$ 17,526			$ 17,571

1. Certificates of deposit with original maturities of less than three months.
2. Certificates of deposit with original maturities of more than three months.
3. Classified as “Short-term investments” in our condensed consolidated balance sheets.
4. Classified as “Long-term investments” in our condensed consolidated balance sheets.

We manage our investments as a single portfolio of highly marketable securities that is intended to be available to meet our current cash requirements. We have no investments in auction rate securities. Certificates of deposit and corporate bonds are typically held until maturity. Corporate equity securities have no maturity and may be sold at any time. Our holding of corporate equity securities consists of common stock of GCS Holdings, Inc. (“GHI”) (previously Global Communication Semiconductors, Inc.), a Taiwan publicly-traded company. We began classifying GHI as an available-for-sale security in the second quarter of 2015 when we determined that there was sufficient trading volume in the exchange for the stock to be deemed readily marketable.

During the three months ended March 31, 2017, we sold the remainder of our GHI stock; therefore, there were no GHI transactions in the three months ended June 30, 2017. During the six months ended June 30, 2017, our cash proceeds from sales of GHI stock were $125,000. Our cost was $48,000 and our gross realized gain from sales of GHI stock was $77,000. As of June 30, 2017, we no longer hold any GHI stock.

During the three months ended June 30, 2016, we sold some of our GHI stock and our cash proceeds from sales of available-for-sale-investments were $222,000. Our cost was $58,000 and our gross realized gain from sales of available-for-sale-investments was $164,000. During the six months ended June 30, 2016, we sold some of our GHI

Table of Contents

stock and our cash proceeds from sales of available-for-sale investments were $468,000. Our cost was $123,000 and our gross realized gain from sales of available-for-sale investments was $345,000.

The gross unrealized losses related to our portfolio of available-for-sale securities were primarily due to changes in interest rates and market and credit conditions of the underlying securities. We have determined that the gross unrealized losses on our available-for-sale securities as of June 30, 2017 are temporary in nature. We periodically review our investment portfolio to identify and evaluate investments that have indications of possible impairment. Factors considered in determining whether a loss is temporary include the magnitude of the decline in market value, the length of time the market value has been below cost (or adjusted cost), credit quality, and our ability and intent to hold the securities for a period of time sufficient to allow for any anticipated recovery in market value.

A portion of our investments would generate a loss if we sold them on June 30, 2017. The following table summarizes the fair value and gross unrealized losses related to available-for-sale securities, aggregated by investment category and length of time that individual securities have been in a continuous unrealized loss position as of June 30, 2017 (in thousands):

	In Loss Position < 12 months		In Loss Position > 12 months		Total In Loss Position	
As of June 30, 2017	Fair Value	Gross Unrealized (Losses)	Fair Value	Gross Unrealized (Losses)	Fair Value	Gross Unrealized (Losses)
Investments:						
Certificates of deposit	$ 2,391	$ (9)	$ 1,867	$ (3)	$ 4,258	$ (12)
Corporate bonds	23,624	(68)	1,700	(1)	25,324	(69)
Total in loss position	$ 26,015	$ (77)	$ 3,567	$ (4)	$ 29,582	$ (81)

The following table summarizes the fair value and gross unrealized losses related to available-for-sale securities, aggregated by investment category and length of time that individual securities have been in a continuous unrealized loss position as of December 31, 2016 (in thousands):

	In Loss Position < 12 months		In Loss Position > 12 months		Total In Loss Position	
As of December 31, 2016	Fair Value	Gross Unrealized (Loss)	Fair Value	Gross Unrealized (Loss)	Fair Value	Gross Unrealized (Loss)
Investments:						
Certificates of deposit	$ 5,211	$ (20)	$ 1,200	$ —	$ 6,411	$ (20)
Corporate bonds	5,037	(35)	3,395	(12)	8,432	(47)

Total in loss position	$ 10,248	$ (55)	$ 4,595	$ (12)	$ 14,843	$ (67)

Investments in Privately-held Companies

We have made strategic investments in private companies located in China in order to gain access at a competitive cost to raw materials that are critical to our substrate business (see Note 7). The investment balances for all of these companies, including minority investments indirectly in privately-held companies made by our consolidated subsidiaries, are accounted for under the equity method and included in "Other assets" in the condensed consolidated balance sheets and totaled \$10.3 million and \$11.3 million as of June 30, 2017 and December 31, 2016, respectively. As of June 30, 2017, there were seven companies accounted for under the equity method. There were no impairment charges in the three months ended June 30, 2017. The six months ended June 30, 2017 include an impairment charge of \$313,000 for one of the gallium companies. During the first quarter of 2017, management determined that it is unlikely that this company will recover from the difficult pricing environment and we had written the investment down to zero. We had no impairment charges for the three and six months ended June 30, 2016.

Table of Contents

Fair Value Measurements

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

The type of instrument valued based on quoted market prices in active markets include our money market funds, which are generally classified within Level 1 of the fair value hierarchy. Other than corporate equity securities which are based on quoted market prices and classified as Level 1, we classify our available-for-sale securities including certificates of deposit and corporate bonds as having Level 2 inputs. The valuation techniques used to measure the fair value of these financial instruments having Level 2 inputs were derived from bank statements, quoted market prices, broker or dealer statements or quotations, or alternative pricing sources with reasonable levels of price transparency.

We place short-term foreign currency hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese Yen. We measure the fair value of these foreign currency hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted in "accrued liabilities" on the condensed consolidated balance sheet and classified as Level 3 assets and liabilities. As of June 30, 2017 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

There were no changes in valuation techniques or related inputs in the three and six months ended June 30, 2017. There have been no transfers between fair value measurements levels during the three months ended June 30, 2017.

The following table summarizes our financial assets and liabilities measured at fair value on a recurring basis as of June 30, 2017 (in thousands):

	Balance as of	Quoted Prices in Active Markets of Identical Assets	Significant Other Observable Inputs	Significant Unobservable Inputs

	June 30, 2017	(Level 1)	(Level 2)	(Level 3)
Assets:				
Cash equivalents and investments:				
Certificates of deposit	$ 6,425	$ —	$ 6,425	$ —
Corporate bonds	25,324	—	25,324	—
Total	$ 31,749	$ —	$ 31,749	$ —

Table of Contents

The following table summarizes our financial assets and liabilities measured at fair value on a recurring basis as of December 31, 2016 (in thousands):

	Balance as of December 31, 2016	Quoted Prices in Active Markets of Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents and investments:				
Certificates of deposit	$ 21,184	$ —	$ 21,184	$ —
Corporate bonds	8,432	—	8,432	—
Corporate equity securities	159	159	—	—
Total	$ 29,775	$ 159	$ 29,616	$ —

Items Measured at Fair Value on a Nonrecurring Basis

Certain assets that are subject to nonrecurring fair value measurements are not included in the table above. These assets include investments in privately-held companies accounted for by the equity or cost method (See Note 7). There were no impairment charges in the three months ended June 30, 2017. The six months ended June 30, 2017 include an impairment charge of $313,000 for one of the gallium companies. During the first quarter of 2017, management determined that it is unlikely that this company will recover from the difficult pricing environment and we had written the investment down to zero. Except as mentioned, we did not record other-than-temporary impairment charges for the remainder of these investments during the three and six months ended June 30, 2017 and 2016.

Note 3. Inventories

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

	June 30, 2017	December 31, 2016
Inventories:		
Raw materials	$ 19,870	$ 17,485
Work in process	18,572	20,410
Finished goods	2,185	2,257
	$ 40,627	$ 40,152

As of June 30, 2017 and December 31, 2016, carrying values of inventories were net of inventory reserves of $12.3 million and $12.0 million, respectively, for excess and obsolete inventory and $211,000 and $254,000, respectively, for lower of cost or net realizable value reserves.

Note 4. Property, Plant and Equipment, Net

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

	June 30, 2017	December 31, 2016
Property, plant and equipment:		
Machinery and equipment, at cost	$ 42,027	$ 41,254
Less: accumulated depreciation and amortization	(38,961)	(37,311)
Building, at cost	30,333	29,600
Less: accumulated depreciation and amortization	(10,465)	(9,654)
Leasehold improvements, at cost	5,048	4,942
Less: accumulated depreciation and amortization	(3,917)	(3,608)
Construction in progress	3,880	2,582
	$ 27,945	$ 27,805

Table of Contents

Note 5. Accrued Liabilities

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

	June 30, 2017	December 31, 2016
Preferred stock dividends payable	$ 2,901	$ 2,901
Accrued compensation and related charges	1,955	2,610
Advance from customers	1,286	238
Current portion of royalty payments	575	575
Dividends payable by consolidated joint ventures	512	499
Accrued professional services	401	583
Accrued income taxes	264	203
Accrued product warranty	130	251
Other accrued liabilities	1,339	1,400
	$ 9,363	$ 9,260

Note 6. Related Party Transactions

In August 2011, our consolidated joint venture, Beijing JiYa Semiconductor Material Co., Ltd. (“JiYa”), entered into a non-interest bearing note agreement in the amount of $1.6 million for a loan to one of its equity investment entities. The original term of the loan was for two years and ten months with three periodic principal payments required. After various amendments to the terms of the note, in December 2013, the parties agreed to delay all principal repayment until December 2017. In December 2016, we determined that this receivable was in substance an investment and began re-classifying this long term loan from “Related party notes receivable – long-term” to “Other assets” in our consolidated balance sheets. As of June 30, 2017 and December 31, 2016, we included $1.3 million and $1.4 million in “Other assets” in our condensed consolidated balance sheets, respectively.

JiYa also purchases raw materials from one of its equity investment entities for production in the ordinary course of business. As of June 30, 2017 and December 31, 2016, amounts payable of $1.9 million and $1.8 million, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

JiYa also sold raw materials to one of its equity investment entities for production in the ordinary course of business. As of June 30, 2017 and December 31, 2016, amounts receivable of $320,000 and $313,000, respectively, were included in “Accounts receivable” in our condensed consolidated balance sheets. During the three months ended

December 31, 2016, we deemed the collection of the outstanding amount to be improbable and established an allowance in full. There have since been no additional sales to the customer and as of June 30, 2017 the existing outstanding amount continues to be fully reserved.

Beginning in 2012, our consolidated joint venture, Nanjing JinMei Gallium Co., Ltd. (“JinMei”), is contractually obligated under an agency sales agreement to sell raw material on behalf of its equity investment entity. JinMei bills the customers and remits the receipts, net of its portions of sales commission, to this equity investment entity. For each of the three months ended June 30, 2017 and 2016, JinMei has recorded $0 income from agency sales. For the six months ended June 30, 2017 and 2016, Jin Mei has recorded $1,000 and $0 income from agency sales, respectively, which were included in “Other (expense) income, net” in the condensed consolidated statements of operations.

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

Table of Contents

Tongmei has paid certain amounts on behalf of Donghai County Dongfang High Purity Electronic Materials Co., Ltd. (“Dongfang”), its equity investment entity, to purchase materials. The original agreement was signed between Tongmei and Dongfang in 2014 and the date of repayment was set as December 31, 2015. In 2015, both parties agreed to delay the date of repayment to December 31, 2017. As of June 30, 2017, the balance of $109,000 was included in “Related party notes receivable – current”. As of December 31, 2016, the balance of $107,000 was included in “Related party notes receivable – long-term” in our condensed consolidated balance sheets.

In April 2014, Tongmei loaned an additional $44,000 to Dongfang. The loan bears interest at 6.15% per annum and comes due on December 31, 2017. During the three months ended June 30, 2017, the repayment of the principal and interest totaling $53,000 was received by our wholly-owned subsidiary. As of June 30, 2017 and December 31, 2016, this balance, including both principal and accrued interest, was $0 and $50,000, respectively, and was included in “Related party notes receivable – long-term” in our condensed consolidated balance sheets.

Tongmei also purchases raw materials from Dongfang for production in the ordinary course of business. As of June 30, 2017 and December 31, 2016, amounts payable of $0 and $210,000, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

Tongmei purchases raw materials from one of our equity investment entities, Emei Shan Jiamei Materials Co. Ltd. (“Jiamei”), for production in the ordinary course of business. As of June 30, 2017 and December 31, 2016, amounts payable of $0 and $377,000, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

Tongmei also purchases raw materials from one of our equity investment entities, Xilingol Tongli Germanium Refine Co. Ltd. (“Tongli”), for production in the ordinary course of business. As of June 30, 2017 and December 31, 2016, amounts payable of $1.3 million and $246,000, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

In April 2016, our consolidated joint venture, BoYu, provided a personal loan of $177,000 to one of its executive employees. This loan is secured by the executive employee’s shares in BoYu. The loan bears interest at 2.75% per annum. Principal and accrued interest are due on March 31, 2019. During the three months ended June 30, 2017, the repayment of the principal and interest totaling $180,000 were received by our consolidated joint venture. As of June 30, 2017 and December 31, 2016, these balances, including both principal and accrued interest, were $0 and $179,000, respectively, and included in “Prepaid expenses and other current assets” in our condensed consolidated balance sheets.

Tongmei also purchases raw materials from one of JiYa’s equity investment entities for production in the ordinary course of business. As of June 30, 2017 and December 31, 2016, amounts payable of $146,000 and $146,000, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

Beijing Kaide Quartz Co. Ltd. (“Kaide”) has been a supplier of customized quartz tubes to the Company since 2004. Beijing XiangHeMing Trade Co. Ltd. (“XiangHeMing”) is a significant shareholder of Kaide. XiangHeMing was previously owned by, among others, certain immediate family members of Davis Zhang, our former President, China Operations, until at least sometime in 2004, at which time the official Chinese government records indicate that Mr. Zhang’s immediate family members transferred their ownership of XiangHeMing to a third party. However, we are currently unable to conclusively determine whether Mr. Zhang’s immediate family members retained any economic interest in XiangHeMing after the transfer. As of June 30, 2017 and December 31, 2016, amounts payable to Kaide of $419,000 and $323,000, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

Our Related Party Transactions Policy seeks to prohibit all conflicts of interest in transactions between related parties and us, unless they have been approved by our Board of Directors. This policy applies to all of our employees, directors, and our consolidated subsidiaries. Our executive officers retain board seats on the board of directors of the companies in which we have invested in our China joint ventures. See Note 7 for further details.

Table of Contents

Note 7. Investments in Privately-Held Companies

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

The six direct investments are summarized below (in thousands):

	Investment Balance as of			
Company	June 30, 2017	December 31, 2016	Accounting Method	Ownership Percentage
Beijing JiYa Semiconductor Material Co., Ltd.	$ 3,331	$ 3,331	Consolidated	46 %
Nanjing JinMei Gallium Co., Ltd.	592	592	Consolidated	83 %
Beijing BoYu Semiconductor Vessel Craftwork Technology Co., Ltd.	1,346	1,346	Consolidated	70 %
	$ 5,269	$ 5,269		
Donghai County Dongfang High Purity Electronic Materials Co., Ltd.	$ 1,394	$ 1,498	Equity	46 %
Xilingol Tongli Germanium Co. Ltd.	3,813	4,000	Equity	25 %
Emeishan Jia Mei High Purity Metals Co., Ltd.	985	1,101	Equity	25 %
	$ 6,192	$ 6,599		

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

Our ownership of JinMei is 83%. We continue to consolidate JinMei as we have a controlling financial interest and have majority control of the board. Our Chief Executive Officer is chairman of the JinMei board and we have appointed two other representatives to serve on the board.

Our ownership of BoYu is 70%. We continue to consolidate BoYu as we have a controlling financial interest and have majority control of the board. Our Chief Executive Officer is chairman of the BoYu board and we have appointed two other representatives to serve on the board.

Although we have representation on the board of directors of each of these companies, the daily operations of each of these companies are managed by local management and not by us. Decisions concerning their respective short-term strategy and operations, ordinary course of business capital expenditures, and decisions concerning sales of finished products, are made by local management with regular guidance and input from us.

During the three months ended June 30, 2017 and 2016, the three consolidated joint ventures generated an income of $208,000 and a loss of $306,000, respectively, of which a loss of $132,000 and a loss of $353,000, respectively, were allocated to noncontrolling interests, resulting in an income of $340,000 and an income of $47,000, respectively, to our net income. During the six months ended June 30, 2017 and 2016, the three consolidated joint ventures generated an income of $196,000 and a loss of $481,000, respectively, of which a loss of $372,000 and a loss of $462,000 respectively, were allocated to noncontrolling interests, resulting in an income of $568,000 and a loss of $19,000, respectively, to our net income.

For AXT's three direct minority investment entities that are not consolidated, the investment balances are included in "Other assets" in our condensed consolidated balance sheets and totaled $6.2 million and $6.6 million as of

Table of Contents

June 30, 2017 and December 31, 2016. We own 46% of the ownership interests in one of these companies and 25% in each of the other two companies. These three companies are not considered variable interest entities because:

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

We also maintain four minority investments indirectly in privately-held companies through our consolidated joint ventures. JiYa holds three investments and JinMei holds one investment. These minority investments are accounted for under the equity method in the books of our consolidated joint ventures. As of June 30, 2017 and December 31, 2016, our consolidated joint ventures included these minority investments in “Other assets” in our condensed consolidated balance sheets with a carrying value of $4.2 million and $4.7 million, respectively.

There were no impairment charges in the three months ended June 30, 2017. The six months ended June 30, 2017 include an impairment charge of $313,000 for one of the gallium companies. During the first quarter of 2017, management determined that it is unlikely that this company will recover from the difficult pricing environment and we had written the investment down to zero.

AXT’s three direct minority investment entities and the three minority investments of JiYa and the one minority investment of JinMei are not consolidated and are accounted for under the equity method. Excluding one fully impaired entity, the equity entities had the following summarized income information (in thousands) for the three and six months ended June 30, 2017 and 2016.

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Net revenue	$ 5,908	$ 7,245	$ 11,363	$ 10,752
Gross profit (loss)	$ 4,277	$ (481)	$ 7,999	$ (435)
Operating loss	$ (794)	$ (1,422)	$ (1,631)	$ (2,540)

Net loss	$ (818)	$ (1,390)	$ (2,523)	$ (3,098)

Our portion of the entity loss from these seven minority investment entities that are not consolidated and are accounted for under the equity method were $188,000 and $400,000 for the three months ended June 30, 2017 and 2016, respectively. Our portion of the entity loss, including impairment charges, from these seven minority investment entities that are not consolidated and are accounted for under the equity method were a loss of $1.1 million and $856,000 for the six months ended June 30, 2017 and 2016, respectively.

Note 8. Stockholders' Equity

Condensed Consolidated Statement of Changes in Stockholders' Equity

(in thousands)

	Preferred Stock	Common Stock	Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	AXT, Inc Stockholders' Equity	Noncontrolling Interests	Total Stockholders' Equity
Balance as of December 31, 2016	$ 3,532	$ 33	$ 194,177	$ (64,985)	$ 253	$ 133,010	$ 4,380	$ 137,390
Common stock options exercised	—	1	884	—	—	885	—	885
Stock-based compensation	—	—	622	—	—	622	—	622
Issuance of common stock, net of stock issuance costs of $2,639	—	5	31,856	—	—	31,861	—	31,861
Net income (loss)	—	—	—	2,595	—	2,595	(372)	2,223
Dividends declared by joint ventures	—	—	—	—	—	—	(465)	(465)
Other comprehensive income	—	—	—	—	1,040	1,040	157	1,197
Balance as of June 30, 2017	$ 3,532	$ 39	$ 227,539	$ (62,390)	$ 1,293	$ 170,013	$ 3,700	$ 173,713

There were no reclassification adjustments from accumulated other comprehensive income for the three and six months ended June 30, 2017 and 2016.

Stock Repurchase Program

On October 27, 2014, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $5.0 million of our outstanding common stock. These repurchases can be made from time to time in the open market and are funded from our existing cash balances and cash generated from operations. During 2015, we repurchased approximately 908,000 shares at an average price of $2.52 per share for a total purchase price of approximately $2.3 million under the stock repurchase program. No shares were repurchased during 2016. During the six months ended June 30, 2017, we did not repurchase any shares under the approved stock repurchase program. As of June 30, 2017, approximately $2.7 million remained available for future repurchases under this program.

Table of Contents

Note 9. Stock-Based Compensation

We account for stock-based compensation in accordance with the provisions of ASC topic 718, Compensation-Stock Compensation ("ASC 718"), which established accounting for stock-based awards exchanged for employee services. Stock-based compensation cost is measured at each grant date, based on the fair value of the award, and is recognized as expense over the employee's requisite service period of the award. All of our stock compensation is accounted for as an equity instrument.

The following table summarizes compensation costs related to our stock-based awards (in thousands, except per share data):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Cost of revenue	$ 7	$ 5	$ 15	$ 10
Selling, general and administrative	252	213	508	413
Research and development	51	37	99	85
Total stock-based compensation	310	255	622	508
Tax effect on stock-based compensation	—	—	—	—
Net effect on net income	$ 310	$ 255	$ 622	$ 508

As of June 30, 2017, the unamortized compensation costs related to unvested stock options granted to employees under our stock option plan was approximately $1.6 million, net of estimated forfeitures of $183,000. These costs will be amortized on a straight-line basis over a weighted-average period of approximately 2.6 years and will be adjusted for subsequent changes in estimated forfeitures. We did not capitalize any stock-based compensation to inventory as of June 30, 2017 and December 31, 2016 due to the immateriality of the amount.

We estimate the fair value of stock options using the Black-Scholes valuation model, consistent with the provisions of ASC 718. There were no options granted in the three months ended June 30, 2017 and 2016. There were 60,000 and 68,000 options with weighted average grant date fair values of $2.76 and $1.01 granted in the six months ended June 30, 2017 and 2016, respectively. The fair values of our stock options granted to employees for the three and six months ended June 30, 2017 were estimated using the following weighted-average assumptions:

	Three Months Ended June 30,	Six Months Ended June 30,

	2017		2017	
Expected term (in years)	—		5.9	
Volatility	—	%	46.71	%
Expected dividend	—	%	—	%
Risk-free interest rate	—	%	2.08	%

17

Table of Contents

The following table summarizes the stock option transactions during the three months ended June 30, 2017 (in thousands, except per share data):

Stock Options	Number of Options Outstanding	Weighted-average Exercise Price	Weighted-average Remaining Contractual Life (in years)	Aggregate Intrinsic Value
Balance as of January 1, 2017	3,294	$ 3.38	7.23	$ 5,301
Granted	60	5.95		
Exercised	(289)	3.06		
Canceled and expired	(14)	2.18		
Balance as of June 30, 2017	3,051	$ 3.47	6.93	$ 8,805
Options vested as of June 30, 2017 and unvested options expected to vest, net of forfeitures	2,997	$ 3.46	6.90	$ 8,690
Options exercisable as of June 30, 2017	1,677	$ 3.35	5.58	$ 5,054

The aggregate intrinsic value in the table above represents the total pretax intrinsic value, based on our closing price of $6.35 on June 30, 2017, which would have been received by the option holder had all option holders exercised their options on that date.

Restricted stock awards

A summary of activity related to restricted stock awards for the six months ended June 30, 2017 is presented below (in thousands, except per share data):

Stock Awards	Shares	Weighted-Average Grant Date Fair Value
Non-vested as of January 1, 2017	325	$ 3.27
Granted	26	$ 6.80
Vested	(74)	$ 3.22
Forfeited	—	$ —
Non-vested as of June 30, 2017	277	$ 3.62

As of June 30, 2017, the unamortized compensation costs related to unvested restricted stock awards was approximately $816,000, which is to be amortized on a straight-line basis over a weighted-average period of approximately 1.1 years.

Table of Contents

Note 10. Net Income Per Share

Basic net income per share is computed using the weighted-average number of common shares outstanding during the periods less shares of common stock subject to repurchase and non-vested stock awards. Diluted net income per share is computed using the weighted-average number of common shares outstanding and potentially dilutive common shares outstanding during the periods. The dilutive effect of outstanding stock options and restricted stock awards is reflected in diluted earnings per share by application of the treasury stock method. Potentially dilutive common shares consist of common shares issuable upon the exercise of stock options and vesting of restricted stock awards. Potentially dilutive common shares are excluded from the computation of weighted-average number of common shares outstanding in net loss years, as their effect would be anti-dilutive to the computation.

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

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Numerator:				
Net income attributable to AXT, Inc	$ 1,930	$ 1,151	$ 2,595	$ 1,193
Less: Preferred stock dividends	(44)	(44)	(88)	(88)
Net income available to common stockholders	$ 1,886	$ 1,107	$ 2,507	$ 1,105
Denominator:				
Denominator for basic net income per share - weighted average common shares	38,306	32,020	36,238	32,011
Effect of dilutive securities:				
Common stock options	1,212	284	1,216	223
Restricted stock awards	188	147	191	120
Denominator for dilutive net income per common shares	39,706	32,451	37,645	32,354
Net income attributable to AXT, Inc. per common share:				
Basic	$ 0.05	$ 0.03	$ 0.07	$ 0.03
Diluted	$ 0.05	$ 0.03	$ 0.07	$ 0.03
Options excluded from diluted net income per share as the impact is anti-dilutive	622	1,343	617	2,551
Restricted stock excluded from diluted net income per share as the impact is anti-dilutive	—	19	5	10

The 883,000 shares of $0.001 par value Series A preferred stock issued and outstanding as of June 30, 2017 and December 31, 2016, 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 a $4 per share liquidation preference over common stock, which 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.

Table of Contents

Note 11. Segment Information and Foreign Operations

Segment Information

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

Product Information

The following table represents revenue amounts (in thousands) by product type:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Product Type:				
Substrates	$ 19,109	$ 16,727	$ 35,718	$ 32,579
Raw Materials and Others	4,448	3,768	8,455	6,629
Total	$ 23,557	$ 20,495	$ 44,173	$ 39,208

Geographical Information

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

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016

Europe (primarily Germany)	$ 5,848	$ 4,573	$ 11,446	$ 8,951
China	6,324	4,183	10,746	7,275
Taiwan	4,195	4,649	7,513	8,784
Japan	2,862	2,695	6,002	4,597
Asia Pacific (excluding China, Taiwan and Japan)	2,645	2,402	4,716	5,152
North America (primarily the United States)	1,683	1,993	3,750	4,449
Total	$ 23,557	$ 20,495	$ 44,173	$ 39,208

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

	As of June 30, 2017	December 31, 2016
Long-lived assets by geographic region, net of depreciation:		
North America	$ 958	$ 318
China	26,987	27,487
	$ 27,945	$ 27,805

20

Table of Contents

Significant Customers

Two customers, Osram Opto and Landmark, represented 12% and 11% respectively, of our revenue for the three months ended June 30, 2017 while two customers, Landmark and IQE Group, represented 14% and 10% of our revenue for the three months ended June 30, 2016. Our top five customers, although not the same five customers for each period, represented 37% and 42% of our revenue for the three months ended June 30, 2017 and 2016, respectively.

Two customers, Osram Opto and Landmark, represented 11% and 10%, respectively, of our revenue for the six months ended June 30, 2017 while two customers, Landmark and IQE Group, each represented 11% of our revenue for the six months ended June 30, 2016. Our top five customers, although not the same five customers for each period, represented 36% and 42% of our revenue for the six months ended June 30, 2017 and 2016, respectively.

We perform ongoing credit evaluations of our customers’ financial condition, and limit the amount of credit extended when deemed necessary, but generally do not require collateral. One customer accounted for 12% of our accounts receivable balance as of June 30, 2017, while one customer accounted for 13% of our accounts receivable balance as of December 31, 2016.

Note 12. Commitments and Contingencies

Indemnification Agreements

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

Product Warranty

We provide warranties for our products for a specific period of time, generally twelve months, against material defects. We provide for the estimated future costs of warranty obligations in cost of sales when the related revenue is recognized. The accrued warranty costs represent the best estimate at the time of sale of the total costs that we expect to incur to repair or replace product parts that fail while still under warranty. The amount of accrued estimated warranty costs are primarily based on historical experience as to product failures as well as current information on repair costs. On a quarterly basis, we review the accrued balances and update the historical warranty cost trends. The following table reflects the change in our warranty accrual which is included in "Accrued liabilities" on the condensed consolidated balance sheets, during the three and six months ended June 30, 2017 and 2016 (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Beginning accrued warranty and related costs	$ 133	$ 431	$ 251	$ 497
Accruals for warranties issued	37	4	70	23
Adjustments related to pre-existing warranties including expirations and changes in estimates	(27)	(64)	(132)	(131)
Cost of warranty repair	(13)	(41)	(59)	(59)
Ending accrued warranty and related costs	$ 130	$ 330	$ 130	$ 330

Contractual Obligations

We lease certain office space, warehouse facilities and equipment under long-term operating leases expiring at various dates through December 2025. The majority of our lease obligations relates to our lease agreement for the facility in Fremont, California with approximately 19,467 square feet, which expires in 2017. We have an option to extend the lease for an additional three years. In May 2017, we exercised this option and the lease was extended for an additional three years. All terms remain the same and this lease will expire in 2020.

We entered into a royalty agreement with a competitor effective December 3, 2010 with a term of eight years, terminating December 31, 2018. We and our related companies are granted a worldwide, nonexclusive, royalty bearing, irrevocable license to certain patents for the term of the agreement. We shall pay up to $7.0 million of royalty payments over eight years that began in 2011 based on future royalty bearing sales. This royalty agreement contains a clause that allows us to claim a credit, starting in 2013, in the event that the royalty bearing sales for the year are lower than a pre-determined amount set forth in this agreement.

The following table summarizes our contractual obligations as of June 30, 2017 (in thousands):

	Payments due by period				
Contractual Obligations	Total	Less than 1 year	1-3 years	4-5 years	More than 5 years
Operating leases	$ 670	$ 221	$ 351	$ 92	$ 6
Royalty agreement	862	575	287	—	—
Total	$ 1,532	$ 796	$ 638	$ 92	$ 6

Purchase Obligations with Penalties for Cancellation

In the normal course of business, we issue purchase orders to various suppliers. In certain cases, we may incur a penalty if we cancel the purchase order. As of June 30, 2017, we do not have any outstanding purchase orders that will incur a penalty if cancelled by the Company.

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 operations.

Note 13. Foreign Exchange Transaction Gains/Losses

We incurred a foreign currency transaction exchange loss of $90,000 and a gain of $169,000 for the three months ended June 30, 2017 and 2016, respectively. We incurred a foreign currency transaction exchange loss of $75,000 and a gain of $244,000 for the six months ended June 30, 2017 and 2016, respectively. These amounts are included in "Other (expense) income, net" on our condensed consolidated statements of operations.

Note 14. 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 recognize interest and penalties related to uncertain tax positions in income tax expense. Income tax expense for the three and six months ended June 30, 2017 includes no interest and penalties. As of June 30, 2017, we have no accrued interest and penalties related to uncertain tax positions. We file income tax returns in the U.S. federal, various states and foreign jurisdictions.

Table of Contents

Provision for income taxes for the three and six months ended June 30, 2017 was mostly related to our wholly owned China subsidiary and our three partially owned subsidiaries in China. Besides the state tax liabilities, no income taxes or benefits have been provided for U.S. operations for the three and six months ended June 30, 2017 due to the loss in the U.S. and the uncertainty of generating future profit in the U.S., which has resulted in our deferred tax asset being fully reserved.

Note 15. Whistleblower Complaint and Investigation

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

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

Note 16. Restructuring Charges

In the second quarter of 2016, we restructured the operations of JiYa, which resulted in a reduction in force of 28 positions that were no longer required to support production and operations. Accordingly, we recorded a restructuring charge of approximately $226,000 related to the reduction in force for severance-related expenses. As of June 30, 2016, we had completed this restructuring plan and the reduction in force.

During the three and six months ended June 30, 2017 and 2016, we incurred no restructuring charges, except as mentioned above.

Note 17. Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standard Board ("FASB") issued Accounting Standards Update ("ASU") 2014-09, which applies to any entity that either enters into contracts with customers to transfer goods or services or enters into contracts for the transfer of non-financial assets, unless those contracts are within the scope of other standards, superseding the existing revenue recognition requirements in ASC Topic 605 "Revenue Recognition." Pursuant to ASU 2014-09, an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange, as applied through a multi-step process to achieve that core principle. Subsequently, the FASB approved a deferral included in ASU 2015-14 that permits public entities to apply the amendments in ASU 2014-09 for annual reporting periods beginning after December 15, 2017, including interim reporting periods therein, and that would also permit public entities to elect to adopt the amendments as of the original effective date as applicable to reporting periods beginning after December 15, 2016.

The FASB has since issued additional updates of its new standard on revenue recognition issued in May 2014. In March 2016, an amendment was issued to clarify the implementation guidance on principal versus agent consideration. The guidance requires entities to determine whether the nature of its promise to provide goods or services to a customer is performed in a principal or agent capacity and to recognize revenue in a gross or net manner based on its principal/agent designation. In April 2016, amendments were issued to clarify the identification of performance obligations and the licensing implementation guidance in the initial standard. Amendments were issued in May 2016

Table of Contents

related to its guidance on assessing collectability, presentation of sales tax, noncash consideration, and completed contracts and contract modification at transition, which reduce the potential for diversity in practice, and the cost and complexity of application at transition and on an ongoing basis. The new guidance allows for the amendment to be applied either retrospectively to each prior reporting period presented or retrospectively as a cumulative-effect adjustment as of the date of adoption. We are currently evaluating the impact that the adoption of ASU 2014-09 and ASU 2015-14 may have on our condensed consolidated financial statements and have not elected a transition method as of the period ended June 30, 2017.

In July 2015, the FASB issued ASU 2015-11, Simplifying the Measurement of Inventory, amending ASC 330. Upon adoption, this topic supersedes the existing guidance under ASC 330 and aims to simplify the subsequent measurement of inventory. Currently, inventory can be measured at the lower of cost or market, which could result in several potential outcomes, as market could be replacement cost, net realizable value or net realizable value less an approximately normal profit margin. The major amendments would be as follows: 1. Inventory should be measured at the lower of cost or net realizable value. 2. Net realizable value is the estimated selling price in the ordinary course of business less reasonably predictable costs of completion, disposal and transportation. 3. The amendment does not apply to inventory measured under LIFO or the retail inventory method. 4. The amendment does apply to all other inventory, which includes inventory measured via FIFO or average cost. We adopted this guidance effective January 1, 2017 and it did not have a significant impact on our condensed consolidated financial statements.

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

In February 2016, the FASB issued ASU 2016-02, which replaces the existing guidance for leases. The new standard establishes a right-of-use (ROU) model that requires a lessee to record a ROU asset and a lease liability on the balance sheet for all leases with terms longer than twelve months. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. The guidance is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years and requires retrospective application. We will adopt in fiscal 2019 and are currently evaluating the impact of the guidance on our condensed consolidated financial statements.

In March 2016, the FASB issued ASU No. 2016-07, which eliminates the requirement to retrospectively apply the equity method in previous periods when an investor initially obtains significant influence over an investee. Under the amended guidance, the investor should apply the equity method prospectively from the date the investment qualifies for the equity method. The guidance is effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years with early application permitted. We adopted this guidance effective January 1, 2017. The Company's adoption of this standard did not have a significant impact on its condensed consolidated financial statements.

In March 2016, the FASB issued ASU No. 2016-09, which simplifies several aspects of the accounting for share-based payment award transactions, including the accounting for income taxes, forfeitures and statutory tax withholding requirements, as well as classification in the statement of cash flows. ASU 2016-09 is effective for fiscal years beginning after December 15, 2016, including interim periods. We adopted this guidance effective January 1,

2017. The Company's adoption of this standard did not have a significant impact on its condensed consolidated financial statements. No excess income tax benefit or tax deficiencies have been recorded as a result of the adoption and there will be no change to accumulated deficit with respect to previously unrecognized excess tax benefits. The Company is electing to continue to account for forfeitures on an estimated basis. We have elected to present the condensed consolidated statements of cash flows on a prospective transition method and no prior periods have been adjusted.

Table of Contents

In August 2016, the FASB issued ASU No. 2016-15, which reduces diversity in practice where the FASB was either unclear or did not provide specific guidance for classifying cash payments and receipts in the statement of cash flows for eight specific transactions. The guidance is effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years and requires retrospective application with early application permitted. We are currently evaluating the impact of the future adoption of this standard on our condensed consolidated financial statements.

In October 2016, the FASB issued ASU No. 2016-16, which clarifies the accounting for the current and deferred income taxes for an intra-entity transfer of an asset other than inventory. The guidance is effective for fiscal years beginning after December 15, 2017, including periods within those fiscal years and requires retrospective application with early application permitted. We are currently evaluating the impact of the future adoption of this standard on our condensed consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-01, which clarifies the definition of a business with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The definition of a business affects many areas of accounting including acquisitions, disposals, goodwill, and consolidation. The guidance is effective for fiscal years beginning after December 15, 2017, including periods within those fiscal years and requires retrospective application with early application permitted. We are currently evaluating the impact of the future adoption of this standard on our condensed consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting. The guidance provides clarity and reduces diversity in practice and cost and complexity when accounting for a change to the terms or conditions of a share-based payment award. The guidance is effective for fiscal years beginning after December 15, 2017. We are currently evaluating the impact the adoption of this ASU will have on our condensed consolidated financial statements.

Note 18. Subsequent Events

One of our consolidated joint ventures, JinMei, is in the process of relocating its headquarters and manufacturing operations to an alternative location. Currently, JinMei has identified a site as a possible candidate and the estimated costs for the land use rights acquisition and facility construction is expected to be approximately $6 million. In July 2017, our wholly-owned subsidiary, Tongmei, provided an inter-company loan to JinMei in the amount of $738,000 in preparation for the acquisition of the land use rights and the construction of a new building. The inter-company loan carries an interest rate of 4.9% per annum and is due on June 30, 2023.

Table of Contents

ITEM 2. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This quarterly report on Form 10-Q contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended. Statements relating to our expectations regarding results of operations, customer demand, customer qualifications of our products, our ability to expand our markets or increase sales, the development of new products, applications, enhancements or technologies, gross margins, expense levels, the impact of the adoption of certain accounting pronouncements, our investments in capital projects, the relocation of our manufacturing operations in China and our belief that we have adequate cash and investments to meet our needs over the next 12 months are forward-looking statements. Words such as “expects,” “anticipates,” “intends,” “plans,” “believes,” “seeks,” “estimates,” “goals,” “should,” “continues,” “would,” “could” and 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 quarterly report. Additionally, statements concerning future matters such as our strategy, plans, industry trends and the impact of trends and economic cycles on our business are forward-looking statements. All forward-looking statements are based upon management’s views as of the date of this quarterly report and are subject to risks and uncertainties that could cause actual results to differ materially from historical results or those anticipated in such forward-looking statements. Such risks and uncertainties include those set forth under the section entitled “Risk Factors” in Item 1A below, as well as those discussed elsewhere in this quarterly report, and identify important factors that could disrupt or injure our business or cause actual results to differ materially from those predicted in any such forward-looking statements

These forward-looking statements are not guarantees of future performance. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. Readers are urged to carefully review and consider the various disclosures made in this report, which attempt to advise interested parties of the risks and factors that may affect our business, financial condition, results of operations and prospects. We undertake no obligation to revise or update any forward looking statements in order to reflect any development, event or circumstance that may arise after the date of this report. This discussion should be read in conjunction with Management’s Discussion and Analysis of Financial Condition and Results of Operations included in our Annual Report on Form 10-K for the year ended December 31, 2016 and the condensed consolidated financial statements included elsewhere in this report.

Table of Contents

Overview

AXT, Inc. ("AXT", "we," "us," and "our" refer to AXT, Inc. and its consolidated subsidiaries) is a worldwide developer and producer of high-performance compound and single element semiconductor substrates, also known as wafers. Our consolidated subsidiaries produce and sell certain raw materials some of which are used in our substrate manufacturing process and some of which are sold to other companies.

Our substrate wafers are used when a typical silicon substrate wafer cannot meet the conductive requirements of a chip. The dominant substrates used in producing semiconductor chips and other electronic circuits are made from silicon. However, certain chips may become too hot or perform their function too slowly if silicon is used as the base material. In addition, optoelectronic applications, such as LED lighting and chip-based lasers, do not use silicon substrates because they require a wave form frequency that cannot be achieved using silicon. Alternative or specialty materials are used to replace silicon as the preferred base in these situations. Our wafers provide such alternative or specialty materials. We have two product lines: specialty material substrates and raw materials integral to these substrates. Our compound substrates combine indium with phosphorous (indium phosphide: InP) or gallium with arsenic (gallium arsenide: GaAs). Our single element substrates are made from germanium (Ge).

Our raw materials include both raw gallium and purified gallium. We use purified gallium in producing our GaAs substrates and sell both raw gallium and purified gallium in the open market to other companies for use in magnetic materials, high temperature thermometers and growing single crystal ingots including gallium arsenide, gallium nitride, gallium antimonide, gallium phosphide and other materials and alloys. We also produce pyrolytic boron nitride (pBN) crucibles used in the high temperature (typically in the range 500 C to 1,500 C) growth process of single crystal ingots and epitaxial layer growth in MBE (Molecular Beam Epitaxy) reactors. We use these pBN crucibles in our own ingot growth processes and also sell them in the open market to other companies. Our substrate product group generated 81%, 75% and 72% of our revenue and our raw materials product group generated 19%, 25% and 28% for 2016, 2015 and 2014, respectively.

Table of Contents

The following chart shows our substrate group and their materials, diameters and illustrative applications and shows our raw materials group primary products and illustrative uses and applications.

Products

Substrate Group	Substrate Diameter	Sample of Applications
Indium Phosphide (InP)	2”, 3”, 4”	• Fiber optic lasers and detectors • Passive Optical Networks (PONs) • Data center connectivity using light/lasers • Silicon photonics • Photonic ICs (PICs) • High efficiency terrestrial solar cells (CPV) • RF amplifier and switching (military wireless and potential 5G) • Lasers • Infrared LED motion control • Infrared thermal imaging
Gallium Arsenide (GaAs - semi-insulating)	1”, 2”, 3”, 4”, 5”, 6”	• Power amplifiers for wireless devices • Direct broadcast television • High-performance transistors • Satellite communications • High efficiency solar cells for drones
Gallium Arsenide (GaAs - semi-conducting)	1”, 2”, 3”, 4”, 6”	• 3-D sensing using VCSELs • Data center communication using VCSELs • High brightness light emitting diodes (LEDs) • Lasers • Near-infrared sensors • Printer head lasers and LEDs • Laser machining, cutting and drilling • Optical couplers • Night vision goggles
Germanium (Ge)	2”, 4”, 6”	• Satellite and terrestrial solar cells • Optical sensors and detectors • Concentrated photo voltaic (CPV) cells for satellites • Multi-junction solar cells for satellites • Infrared detectors
Raw Materials Group		
4N raw gallium		• Magnetic materials • High temperature thermometers • Low melting point alloys • Optical glass • Infrared detectors
6N+ purified gallium		• Key material in single crystal ingots such as: - Gallium Arsenide (GaAs) - Gallium Nitride (GaN) - Gallium Antimonide (GaSb) - Gallium Phosphide (GaP)
Boron trioxide (B_2O_3)		• Encapsulant in the ingot growth of III-V compound semiconductors

Gallium-Magnesium alloy	• Used for the synthesis of organo-gallium compounds in epitaxial growth on semiconductor wafers
pyrolytic boron nitride (pBN) crucibles	• Used when growing single-crystal compound semiconductor ingots • Used when growing epitaxial layers in MBE reactors

We manufacture all of our products in the People’s Republic of China (PRC or China), which generally has favorable costs for facilities and labor compared with comparable facilities in the United States, Europe or Japan. Our

28

Table of Contents

supply chain includes partial ownership of 10 companies in China (subsidiaries/joint ventures). We believe this supply chain arrangement provides us with pricing advantages, reliable supply, market trend visibility and better sourcing lead-times for key raw materials central to manufacturing our substrates. Our subsidiaries and joint venture companies produce materials, including pure raw gallium (4N Ga), high purity gallium (6N Ga), arsenic, germanium, germanium dioxide, pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). Our ownership and the ownership held by our consolidated subsidiaries in these entities range from 83% to 20%. We have board representation in all 10 of these companies. We consolidate the companies in which we have either a controlling financial interest, or majority financial interest combined with the ability to exercise substantive control over the operation or financial decisions made by the subsidiary. We use the equity method to account for companies in which we have smaller financial interest and have the ability to exercise significant influence, but not control, over the subsidiary. We purchase portions of the materials produced by these joint venture companies for our own use and sell the remainder of their production to third parties.

The Beijing city government has announced that it will expand its offices into the area where our manufacturing facility is located and we believe the Beijing city government intends to relocate thousands of government employees. The Beijing city government desires to upgrade this area and has applied pressure on manufacturing companies to relocate, including us. We are working with the Beijing city government and we have formed a relocation plan to identify a new manufacturing site, acquire land use rights for such site, construct a facility and move our gallium arsenide production line. We have now identified a new manufacturing site and are in the process of negotiating the necessary documents to acquire the land use rights to this site. However, the documents are not yet completed and no party has signed the documents. To reduce risks we plan to move equipment in stages so that we will produce our gallium arsenide products at both sites and then subsequently transfer increasing volume to the new site. We intend to complete this relocation by the end of 2018 or the first half of 2019.

The Beijing city government's economic development bureau has requested that we consider maintaining our indium phosphide production operations at our current site, along with our China headquarters and research and development ("R&D") center. We intend to relocate our gallium arsenide and germanium production, but we may avoid moving indium phosphide production if we elect to remain at our current site. Over time it may be more efficient to consolidate all production at one site.

In light of our relocation plan and our cooperation with the Beijing city government, we believe we may be able to relocate the portion of our production facilities that we agree to relocate smoothly and safely and in a reasonable manner, without a material disruption of supply to our customers. To minimize the disruption to our customers, we plan to move our equipment in stages so that, initially, we will produce our gallium arsenide substrates at both sites, and then gradually increase our production volume at the new site. The relocation of all or part of our operations requires us to execute our relocation plan and we expect that our major customers will want to examine and qualify the wafer substrates produced at the new site before placing volume purchase orders for products produced at the new site. A failure to properly execute our relocation plan could result in disruption to our production and have a material adverse impact on our revenue and our results of operations and financial condition. If we fail to meet the product qualification requirements of a customer, we may lose sales to that customer. Our reputation may also be damaged. Any loss of sales could have a material adverse effect on our revenue and our results of operations and financial condition.

To date, we have not completed a land use rights purchase of our new manufacturing site. We do not yet have construction bids or third party estimates for the relocation costs or construction costs of our future manufacturing facility, but we currently believe the land use rights purchase amount, relocation costs and facility construction costs will be in the range of $25 million to $35 million, but could be substantially more expensive. Further, we believe that we may recover some of these costs by monetizing the vacated property at our current site in Beijing. We currently believe the soonest we could monetize the vacated property is the year 2020.

Critical Accounting Policies and Estimates

We prepare our condensed 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 condensed 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

Table of Contents

historical experience and on other assumptions that are believed to be reasonable under the circumstances. These estimates may change as new events occur or additional information is obtained, and we may periodically be faced with uncertainties, the outcomes of which are not within our control and may not be known for a prolonged period of time.

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

Revenue Recognition

We manufacture and sell high-performance compound semiconductor substrates including indium phosphide, semi-conducting and semi-insulating gallium arsenide and germanium wafers, and our three consolidated subsidiaries sell certain raw materials including 99.99% pure gallium (4N Ga), high purity gallium (7N Ga), pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). After we ship our products, there are no remaining obligations or customer acceptance requirements that would preclude revenue recognition. Our products are typically sold pursuant to a purchase order placed by our customers, and our terms and conditions of sale do not require customer acceptance. We recognize revenue upon shipment and transfer of title of products to our customers, which is either upon shipment from our dock, receipt at the customer's dock, or removal from consignment inventory at the customer's location, provided that we have received a valid purchase order, the price is fixed or determinable, title and risk of ownership have transferred, collection of resulting receivables is probable, and product returns are reasonably estimable. We do not provide training, installation or commissioning services.

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

Accounts Receivable 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 with an emphasis on balances in excess of 90 days and for receivables from customers located outside the U.S. with an emphasis on balances in excess of 120 days and establish a reserve on the receivable balances if needed. The reason for the difference in the evaluation of receivables between foreign and U.S. customers is that U.S.

customers have historically made payments in a shorter period of time than foreign customers. Foreign business practices generally require us to allow customer payment terms that are longer than those accepted in the United States. We assess the probability of collection based on a number of factors, including the length of time a receivable balance has been outstanding, our past history with the customer and their creditworthiness.

As of June 30, 2017 and December 31, 2016, our accounts receivable, net balance was $18.3 million and $14.5 million, respectively, which was net of an allowance for doubtful accounts of $653,000 and $653,000, respectively. 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 future periods.

The allowance for sales returns is also deducted from gross accounts receivable. As of June 30, 2017 and December 31, 2016, our allowance for sales returns was $166,000 and $360,000, respectively.

Warranty Reserve

We maintain a warranty reserve based upon our claims experience during the prior twelve months and any pending claims and returns of which we are aware. Warranty costs are accrued at the time revenue is recognized. As of June 30, 2017 and December 31, 2016, accrued product warranties totaled $130,000 and $251,000, respectively.

The decrease in accrued product warranties is primarily attributable to decreased claims for quality issues experienced by customers. If actual warranty costs or pending new claims differ substantially from our estimates, revisions to the estimated warranty liability would be required, which could have a material impact on our financial condition and results of operations for future periods.

Inventory Valuation

Inventories are stated at the lower of cost (approximated by standard cost) or net realizable value. 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. We routinely evaluate the levels of our inventory in light of current market conditions in order to identify excess and obsolete inventory, and we provide a valuation allowance for certain inventories based upon the age and quality of the product and the projections for sale of the completed products. As of June 30, 2017 and December 31, 2016, we had an inventory reserve of $12.3 million and $12.0 million, respectively, for excess and obsolete inventory and $211,000 and $254,000, respectively, for lower of cost or net realizable value reserves. If actual demand for our products were to be substantially lower than estimated, additional inventory adjustments for excess or obsolete inventory might be required, which could have a material impact on our business, financial condition and results of operations.

Impairment of Investments

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

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

There were no impairment charges in the three months ended June 30, 2017. The six months ended June 30, 2017 include an impairment charge of $313,000 for one of the gallium companies. During the first quarter of 2017, management determined it unlikely that this company will recover from the difficult pricing environment and we had written the investment down to zero. We had no impairment charges for the three and six months ended March 31, 2016.

Fair Value of Investments

ASC 820, Fair Value Measurements and Disclosures ("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.

Table of Contents

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 bank statements, 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 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.

We place short-term foreign currency hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these foreign currency hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end any foreign currency hedges not settled are netted in “accrued liabilities” on the condensed consolidated balance sheet and classified as Level 3 assets and liabilities. As of June 30, 2017 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

There have been no transfers between fair value measurement levels during the three and six months ended June 30, 2017 and 2016.

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 these 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 assets' 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 condensed consolidated balance sheets as of June 30, 2017 and December 31, 2016.

Stock-based Compensation

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

32

Table of Contents

compensation. We use historical forfeitures to estimate the rate of future forfeitures. Changes in these inputs and assumptions can materially affect the measure of estimated fair value of our stock compensation. The cost of restricted stock awards is determined using the fair value of our common stock on the date of grant.

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

In March 2016, the Financial Accounting Standards Board issued Accounting Standards Update 2016-09, Improvements to Employee Share-Based Payment Accounting. This ASU affects entities that issue share-based payment awards to their employees. The ASU is designed to simplify several aspects of accounting for share-based payment award transactions which include the income tax consequences, classification of awards as either equity or liabilities, classification on the statement of cash flows and forfeiture rate calculations. ASU 2016-09 is effective for public companies for annual periods and interim periods within those annual periods beginning after December 15, 2016. We adopted this ASU as of January 1, 2017. The adoption of ASU 2016-09 did not have a material effect on our condensed consolidated financial statements.

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 14—"Income Taxes" in the notes to condensed financial statements for additional information.

Table of Contents

Results of Operations

Revenue

	Three Months Ended June 30,		Increase		Six Months Ended June 30,		Increase	
	2017	2016	(Decrease)	% Change	2017	2016	(Decrease)	% Change
Product Type:	($ in thousands)				($ in thousands)			
Substrates	$ 19,109	$ 16,727	$ 2,382	14.2 %	$ 35,718	$ 32,579	$ 3,139	9.6 %
Raw Materials and Others	4,448	3,768	680	18.0 %	8,455	6,629	1,826	27.5 %
Total revenue	$ 23,557	$ 20,495	$ 3,062	14.9 %	$ 44,173	$ 39,208	$ 4,965	12.7 %

Revenue increased $3.1 million, or 14.9%, to $23.6 million for the three months ended June 30, 2017 from $20.5 million for the three months ended June 30, 2016. The revenue increase for the three months ended June 30, 2017 as compared to the same period in 2016 was primarily the result of stronger raw material sales performance from our consolidated subsidiaries and higher demand for all of our substrates wafers from our major customers, resulting in a ten percent or more growth in each of our wafer products in 2017 as compared to the same period in 2016. In general, the increase in our raw material sales and substrate sales resulted from higher overall units sold while average selling prices remained either flat or, in some cases, were down slightly. Our Ge substrate revenue increased in the three months ended June 30, 2017 as compared to the same period in 2016 primarily due to more planned satellite launches in 2017.

Revenue increased $5.0 million, or 12.7%, to $44.2 million for the six months ended June 30, 2017 from $39.2 million for the six months ended June 30, 2016. The revenue increase for the six months ended June 30, 2017 as compared to the same period in 2016 was primarily the result of stronger raw material sales performance from our consolidated subsidiaries, which was partially offset by the reduction of the average selling price of raw gallium (4N), and higher demand for each of our wafer products in 2017. Additionally, the average selling price of purified gallium (greater than 4N purity) stabilized as demand increased and the market was less oversupplied, which contributed to the stronger performance of our raw material sales.

Revenue by Geographic Region

	Three Months Ended June 30, 2017	2016	Increase (Decrease)	% Change
	($ in thousands)			
Europe (primarily Germany)	$ 5,848	$ 4,573	$ 1,275	27.9 %
% of total revenue	25 %	22 %		
China	6,324	4,183	2,141	51.2 %
% of total revenue	27 %	20 %		
Taiwan	4,195	4,649	(454)	(9.8) %
% of total revenue	18 %	23 %		
Japan	2,862	2,695	167	6.2 %
% of total revenue	12 %	13 %		
Asia Pacific (excluding China, Taiwan and Japan)	2,645	2,402	243	10.1 %
% of total revenue	11 %	12 %		
North America (primarily the United States)	1,683	1,993	(310)	(15.6) %
% of total revenue	7 %	10 %		
Total revenue	$ 23,557	$ 20,495	$ 3,062	14.9 %

In aggregate, the combined revenue from the entire Asian market increased $2.1 million to $16.0 million for the three months ended June 30, 2017, from $13.9 million for the three months ended June 30, 2016. The revenue increase in the Asian market for the three months ended June 30, 2017 as compared to the same period in 2016 was a result of stronger raw material sales performance from our consolidated subsidiaries and higher demand for all of our substrates

Table of Contents

wafers from our major customers. Revenue from the Europe market increased $1.3 million in the three months ended June 30, 2017 as compared to the same period in 2016 as a result of a stronger sales of semi-conducting GaAs substrates. Revenue from the Taiwan market, however, decreased $454,000 in the three months ended June 30, 2017 as compared to the same period in 2016 primarily due to a slowing of sales of substrate in that market. Revenue from North America decreased $310,000 for the three months ended June 30, 2017 to $1.7 million from $2.0 million for the three months ended June 30, 2016 as a result of lower demand in GaAs sales.

	Six Months Ended June 30,		Increase	
	2017	2016	(Decrease)	% Change
	($ in thousands)			
Europe (primarily Germany)	$ 11,446	$ 8,951	$ 2,495	27.9 %
% of total revenue	26 %	23 %		
China	10,746	7,275	3,471	47.7 %
% of total revenue	24 %	19 %		
Taiwan	7,513	8,784	(1,271)	(14.5) %
% of total revenue	17 %	22 %		
Japan	6,002	4,597	1,405	30.6 %
% of total revenue	14 %	12 %		
Asia Pacific (excluding China, Taiwan and Japan)	4,716	5,152	(436)	(8.5) %
% of total revenue	11 %	13 %		
North America (primarily the United States)	3,750	4,449	(699)	(15.7) %
% of total revenue	8 %	11 %		
Total revenue	$ 44,173	$ 39,208	$ 4,965	12.7 %

The combined revenue from Europe, China and Japan increased $7.4 million to $28.2 million for the six months ended June 30, 2017 from $20.8 million for the six months ended June 30, 2016. The revenue increase for the six months ended June 30, 2017 as compared to the same period in 2016 was a result of an increase in our substrate products and raw materials sales. Except for China and Japan, revenue from other Asian countries and North America decreased $2.4 million for the six months ended June 30, 2017 to $16.0 million from $18.4 million for the six months ended June 30, 2016. The revenue decrease from these countries for the six months ended June 30, 2017 as compared to the same period in 2016 was primarily due to a decrease in our substrate product sales in these regions. In addition, raw materials sales in these regions also decreased slightly in the six months ended June 30, 2017.

Gross Margin

Three Months Ended June 30,		Increase		Six Months Ended June 30,		Increase	
2017	2016	(Decrease)	% Change	2017	2016	(Decrease)	% Change
($ in thousands)				($ in thousands)			

Gross profit	$ 7,256	$ 6,027	$ 1,229	20.4 %	$ 13,544	$ 11,280	$ 2,264	20.1 %
Gross Margin %	30.8 %	29.4 %			30.7 %	28.8 %		

Gross profit increased $1.2 million, or 20.4%, to $7.3 million for the three months ended June 30, 2017 from $6.0 million for the three months ended June 30, 2016. Gross profit increased primarily due to lower raw material costs used in our wafer substrates, overall improvements in yield and manufacturing efficiencies and higher production volume for the three months ended June 30, 2017 as compared to the same period in 2016. However, the effect of these favorable factors was partially offset by higher excess and obsolescence charges in the three months ended June 30, 2017 as compared to same period in 2016.

Gross profit increased $2.3 million, or 20.1%, to $13.5 million for the six months ended June 30, 2017 from $11.3 million for the six months ended June 30, 2016. Gross profit increased primarily due to lower raw material costs used in our wafer substrates, overall improvements in yield and manufacturing efficiencies and higher production volume for the six months ended June 30, 2017 as compared to the same period in 2016. However, the effect of these favorable factors was partially offset by higher manufacturing costs, including unfavorable job variances, incurred as we

Table of Contents

sought to make on-time shipments after the electrical fire in our Beijing facility on the evening of March 15, 2017 and higher excess and obsolescence charges in the six months ended June 30, 2017 as compared to the same period in 2016.

Selling, General and Administrative Expenses

	Three Months Ended June 30, 2017	2016	Increase (Decrease)	% Change	Six Months Ended June 30, 2017	2016	Increase (Decrease)	% Change
	($ in thousands)				($ in thousands)			
Selling, general and administrative expenses	$ 3,942	$ 3,419	$ 523	15.3 %	$ 7,735	$ 6,793	$ 942	13.9 %
% of total revenue	16.7 %	16.7 %			17.5 %	17.3 %		

Selling, general and administrative expenses increased $523,000, or 15.3%, to $3.9 million for the three months ended June 30, 2017 from $3.4 million for the three months ended June 30, 2016. The higher selling, general and administrative expenses were primarily from higher consulting, professional service fees and personnel-related costs.

Selling, general and administrative expenses increased $942,000, or 13.9%, to $7.7 million for the six months ended June 30, 2017 from $6.8 million for the six months ended June 30, 2016. The higher selling, general and administrative expenses were primarily from higher consulting, professional service fees, personnel-related costs and from expenses incurred as a result of business interruption caused by the electrical fire in our Beijing facility on the evening of March 15, 2017.

Research and Development

	Three Months Ended June 30, 2017	2016	Increase (Decrease)	% Change	Six Months Ended June 30, 2017	2016	Increase (Decrease)	% Change
	($ in thousands)				($ in thousands)			
Research and development	$ 1,019	$ 1,472	$ (453)	(30.8) %	$ 2,143	$ 2,853	$ (710)	(24.9) %
	4.3 %	7.2 %			4.9 %	7.3 %		

% of total
revenue

Research and development expenses decreased $453,000, or 30.8% to $1.0 million for the three months ended June 30, 2017 from $1.5 million for the three months ended June 30, 2016. The decrease in research and development expenses for the three months ended June 30, 2017 was primarily due to the reduced use of raw materials for product development at one of our consolidated subsidiaries.

Research and development expenses decreased $710,000, or 24.9% to $2.1 million for the six months ended June 30, 2017 from $2.9 million for the six months ended June 30, 2016. The decrease in research and development expenses for the six months ended June 30, 2017 was primarily due to the reduced use of raw materials for product development at one of our consolidated subsidiaries and lower personnel related cost.

Table of Contents

Interest Income, Net

	Three Months Ended June 30, 2017	2016	Increase (Decrease)	% Change	Six Months Ended June 30, 2017	2016	Increase (Decrease)	% Change
	($ in thousands)				($ in thousands)			
Interest income, net	$ 114	$ 100	$ 14	14.0 %	$ 212	$ 198	$ 14	7.1 %
% of total revenue	0.5 %	0.5 %			0.5 %	0.5 %		

Interest income, net remained virtually unchanged for three months and six months ended June 30, 2017 as compared to the same period in 2016. The consistent level of interest income resulted from our similar mix of investment securities held.

Equity in Loss of Unconsolidated Joint Ventures

	Three Months Ended June 30, 2017	2016	(Increase) Decrease	% Change	Six Months Ended June 30, 2017	2016	(Increase) Decrease	% Change
	($ in thousands)				($ in thousands)			
Equity in loss of unconsolidated joint ventures	$ (188)	$ (400)	$ 212	53.0 %	$ (1,121)	$ (856)	$ (265)	(31.0) %
% of total revenue	(0.8) %	(2.0) %			(2.5) %	(2.2) %		

Equity in loss of unconsolidated joint ventures is the aggregate net loss from our seven minority-owned joint ventures that are not consolidated. Equity in loss of unconsolidated joint ventures decreased $212,000 to a loss of $188,000 for the three months ended June 30, 2017 from a loss of $400,000 for the three months ended June 30, 2016 as our unconsolidated joint ventures had reported better performance in the three months ended in June 30, 2017 as compared to the same period of 2016. There were no impairment charges in the three months ended June 30, 2017.

Equity in loss of unconsolidated joint ventures increased $265,000 to a loss of $1.1 million for the six months ended June 30, 2017 from a loss of $856,000 for the six months ended June 30, 2016. The six months ended June 30, 2017 include an impairment charge of $313,000 for one of the gallium companies. During the first quarter of 2017, management determined it is unlikely that this company will recover from the difficult pricing environment and we had written the investment down to zero. There were no impairment charges in the three months ended June 30, 2016.

Other (Expense) Income, Net

	Three Months Ended June 30,				Six Months Ended June 30,			
	2017	2016	Increase (Decrease)	% Change	2017	2016	Increase (Decrease)	% Change
	($ in thousands)				($ in thousands)			
Other (expense) income, net	$ (102)	$ 328	$ (430)	(131.1) %	$ (54)	$ 518	$ (572)	(110.4) %
% of total revenue	(0.4) %	1.6 %			(0.1) %	1.3 %		

Other (expense) income, net decreased $430,000 to a loss of $102,000 for the three months ended June 30, 2017 from income of $328,000 for the three months ended June 30, 2016. Other (expense) income, net decreased $572,000 to a loss of $54,000 for the three months ended June 30, 2017 from income of $518,000 for the three months ended June 30, 2016. Other (expense) income, net decreased primarily due to a lower realized gain recognized from sales of GHI stock in the three and six months ended June 30, 2017 as compared to the same periods in 2016. As of June 30, 2017, we no longer hold any GHI stock.

Table of Contents

Provision for Income Taxes

	Three Months Ended June 30,		Increase		Six Months Ended June 30,		Increase	
	2017	2016	(Decrease)	% Change	2017	2016	(Decrease)	% Change
	($ in thousands)				($ in thousands)			
Provision for income taxes	$ 321	$ 140	$ 181	129.3 %	$ 480	$ 537	$ (57)	(10.6) %
% of total revenue	1.4 %	0.7 %			1.1 %	1.4 %		

Provision for income taxes for the three and six months ended June 30, 2017 was $321,000 and $480,000, respectively, which were mostly related to our China subsidiary and our three consolidated joint venture companies in China. Provision for income taxes increased $181,000 for the three months ended June 30, 2017 as compared to the same period in 2016 was due to higher income taxes expense incurred from our wholly owned China subsidiary. No income taxes or benefits have been provided for our U.S. operations due to the loss in the U.S. and the uncertainty of generating future profit in the U.S., which have resulted in our deferred tax assets being fully reserved. Our estimated tax rate can vary greatly from year to year because of the change or benefit in the mix of taxable income between our U.S. and China based operations.

Noncontrolling Interests

	Three Months Ended June 30,		(Increase)		Six Months Ended June 30,		(Increase)	
	2017	2016	Decrease	% Change	2017	2016	Decrease	% Change
	($ in thousands)				($ in thousands)			
Noncontrolling interests	$ (132)	$ (353)	$ 221	62.6 %	$ (372)	$ (462)	$ 90	19.5 %
% of total revenue	(0.6) %	(1.7) %			(0.8) %	(1.2) %		

The decrease in noncontrolling interests' share of losses for the three and six months ended June 30, 2017 as compared to the same period in 2016 was due to higher profitability from two of our three consolidated subsidiaries in China which was partially offset with lower profitability from our other consolidated subsidiary in China.

Liquidity and Capital Resources

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 June 30, 2017, our principal source of liquidity was $87.5 million, which consisted of cash and cash equivalents of $56.5 million, short-term investments of $22.5 million and long-term investments of $8.6 million. In the six months ended June 30, 2017, cash and cash equivalents increased by $20.3 million and short-term and long-term investments increased by $13.5 million. The increase in cash and cash equivalents of $20.3 million in the six months ended June 30, 2017 was primarily due to net cash provided by operating activities of $3.2 million, net cash provided by financing activities of $32.3 million, primarily due to the net proceeds of $31.9 million received from the public offering of 5,307,692 shares of our common stock in March 2017 and the effect of exchange rate changes of $0.2 million, which were partially offset by net cash used in investing activities of $15.4 million. As of June 30, 2017, we and our consolidated joint ventures held approximately $11.2 million in cash and investments in foreign bank accounts. This consists of $5.0 million held by our wholly owned subsidiary in China and $6.2 million held by our three partially-owned consolidated subsidiaries in China. Of this $11.2 million, approximately $6.4 million would not be available for use in the United States without paying United States income taxes. We believe that the current value of our net operating loss carryforwards would offset the taxes due.

As of June 30, 2016, our principal source of liquidity was $45.0 million, which consisted of cash and cash equivalents of $26.1 million, short-term investments of $10.5 million and long-term investments of $8.4 million. In the six months ended June 30, 2016, cash and cash equivalents increased by $1.2 million and short-term and long-term

Table of Contents

investments decreased by $281,000. The increase in cash and cash equivalents of $1.2 million in the six months ended June 30, 2016 was primarily due to net cash provided by operating activities of $3.0 million which were partially offset by net cash used in investing activities of $1.3 million and net cash used in financing activities of $37,000 and the effect of exchange rate changes of $421,000. As of June 30, 2016, we and our consolidated joint ventures held approximately $20.3 million in cash and investments in foreign bank accounts. This consists of $14.2 million held by our wholly owned subsidiary in China and $6.1 million held by our three partially-owned consolidated subsidiaries in China. Of this $20.3 million, approximately $14.8 million would not be available for use in the United States without paying United States income taxes.

Net cash provided by operating activities of $3.2 million for the six months ended June 30, 2017 was primarily comprised of a net income of $2.2 million, adjusted for non-cash items of depreciation and amortization of $2.3 million, loss on equity method investments of $0.8 million, stock-based compensation of $0.6 million, impairment charge on equity investee of $0.3 million, which were partially offset by a net change of $3.0 million in operating assets and liabilities.

Net cash provided by operating activities of $3.0 million for the six months ended June 30, 2016 was primarily comprised of a net income of $731,000, adjusted for non-cash items of depreciation of $2.4 million, amortization of marketable securities premium of $62,000, stock-based compensation of $508,000 and loss on equity method investments of $856,000 which were partially offset by realized gain on sales of investments of $345,000 and a net change of $1.2 million in operating assets and liabilities.

Net cash used in investing activities of $15.4 million for the six months ended June 30, 2017 was primarily from the purchase of marketable investment securities totaling $23.8 million and the purchase of property, plant and equipment of $1.8 million, which were partially offset by proceeds from maturities and sales of available-for-sale securities of $10.2 million.

Net cash used in investing activities of $1.3 million for the six months ended June 30, 2016 was primarily from the purchase of investments totaling $7.9 million and the purchase of equipment of $1.7 million which were partially offset by proceeds from maturities and sales of available-for-sales securities of $8.3 million.

Net cash provided by financing activities was $32.3 million for the six months ended June 30, 2017, which mainly consisted of $31.9 million net proceeds from the issuance of 5,307,692 shares of common stock as a result of our March 2017 stock offering and net proceeds of $0.9 million on the issuance of common stock pursuant to stock option exercises, which were partially offset by net dividends paid by our joint ventures of $0.5 million.

Net cash used in financing activities was $37,000 for the six months ended June 30, 2016, which mainly consisted of net dividends paid by our joint ventures.

On October 27, 2014, our Board of Directors approved a stock repurchase program pursuant to which we may repurchase up to $5.0 million of our outstanding common stock. These repurchases could be made from time to time in the open market and could be funded from our existing cash balances and cash generated from operations. During 2015, we repurchased approximately 908,000 shares at an average price of $2.52 per share for a total purchase price of approximately $2.3 million under the stock repurchase program. No shares were repurchased during 2016 under this program. During the six months ended June 30, 2017, we did not repurchase any shares under the approved stock repurchase program. As of June 30, 2017, approximately $2.7 million remained available for future repurchases under this program.

Dividends accrue on our outstanding Series A preferred stock, and are payable as and when declared by our board of directors. We have never paid or declared any dividends on the Series A preferred stock. By the terms of the Series A preferred stock, so long as any shares of Series A preferred stock are outstanding, neither the Company nor any subsidiary of the Company shall redeem, repurchase or otherwise acquire any shares of common stock, unless all accrued dividends on the Series A preferred stock have been paid. During 2013 and 2015, we repurchased shares of our outstanding common stock. As of December 31, 2015, the Series A preferred stock had cumulative dividends of $2.9 million and we include such cumulative dividends in “Accrued liabilities” in our condensed consolidated balance sheets. If we are required to pay the cumulative dividends on the Series A preferred stock, our cash and cash equivalents would be reduced. We account for the cumulative year to date dividends on the Series A preferred stock when calculating our earnings per share.

The China central government is working with the Beijing city government to design a master development plan of the area where our manufacturing facility is located, which will result in the relocation of many of the manufacturing companies in our district. We have been asked to relocate our gallium arsenide production line. We are working with the Beijing city government and we have formed a relocation plan to identify a new manufacturing site, acquire land use rights for such site, construct a facility and move our gallium arsenide production line. We have now identified a new manufacturing site and are in the process of negotiating the necessary documents to acquire the land use rights to this site. We intend to complete this relocation by the end of 2018 or the first half of 2019. To date, we have not completed a land use rights purchase of our new manufacturing site. We do not yet have construction bids or third party estimates for the relocation costs or construction costs of our future manufacturing facility, but we currently believe the land use rights purchase amount, relocation costs and facility construction costs will be in the range of $25 million to $35 million, but could be substantially more expensive.

One of our consolidated joint ventures, JinMei, is in the process of relocating its headquarters and manufacturing operations to an alternative location. Currently, JinMei has identified a site as a possible candidate and the estimated costs for the land use rights acquisition and facility construction is expected to be approximately $6 million. In July 2017, our wholly-owned subsidiary, Tongmei, provided an inter-company loan to JinMei in the amount of $738,000 in preparation for the acquisition of the land use rights and the construction of a new building. The inter-company loan carries an interest rate of 4.9% per annum and is due on June 30, 2023.

We believe that we have adequate cash and investments to meet our operating needs over the next twelve months. If our sales decrease, however, our ability to generate cash from operations will be adversely affected which could adversely affect our future liquidity, require us to use cash at a more rapid rate than expected, and require us to seek additional capital.

On October 24, 2016, we filed with the SEC a registration statement on Form S-3, pursuant to which we may offer up to $60 million of common stock, preferred stock, depositary shares, warrants, debt securities and/or units in one or more offerings and in any combination. On November 4, 2016, the SEC declared the registration statement effective. A prospectus supplement, which we will provide each time we offer securities, will describe the specific amounts, prices and terms of the securities we determine to offer.

On March 2, 2017, we filed with the SEC a final prospectus supplement, pursuant to which we offered and sold 5,307,692 shares of our common stock. The net proceeds will be used for the purchase of land and the construction of a building needed for the relocation of our gallium arsenide production line, for equipment capital expenditures, working capital for accounts receivable and inventory, possible acquisitions of complementary products, technologies or businesses and other general purposes.

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

Contractual Obligations and Operating Leases

We lease certain office space, warehouse facilities and equipment under long-term operating leases expiring at various dates through December 2025. The majority of our lease obligations relates to our lease agreement for the facility in Fremont, California with approximately 19,467 square feet.

We entered into a royalty agreement with a competitor effective December 3, 2010 with a term of eight years, terminating December 31, 2018. We and our related companies are granted a worldwide, nonexclusive, royalty bearing, irrevocable license to certain patents for the term of the agreement. We shall pay up to $7.0 million of royalty payments over eight years that began in 2011 based on future royalty bearing sales. This agreement contains a clause that allows us

Table of Contents

to claim credit, starting in 2013, in the event that the royalty bearing sales for the year is lower than a pre-determined amount set forth in this agreement.

Outstanding contractual obligations as of June 30, 2017 are summarized as follows (in thousands):

	Payments due by period				
Contractual Obligations	Total	Less than 1 year	1-3 years	4-5 years	More than 5 years
Operating leases	$ 670	$ 221	$ 351	$ 92	$ 6
Royalty agreement	862	575	287	—	—
Total	$ 1,532	$ 796	$ 638	$ 92	$ 6

Purchase orders or contracts for the purchase of certain goods and services are not included in the preceding table. We cannot determine the aggregate amount of such purchase orders that represent contractual obligations because purchase orders may represent authorizations to purchase rather than binding agreements. For the purposes of this table, contractual obligations for purchase of goods or services are defined as agreements that are enforceable and legally binding and that specify all significant terms, including fixed or minimum quantities to be purchased; fixed, minimum, or variable price provisions; and the approximate timing of the transaction. Our purchase orders are based on our current needs and are fulfilled by our vendors within short time horizons. We also enter into contracts for outsourced services; however, the obligations under these contracts were not significant and the contracts generally contain clauses allowing for cancellation without significant penalty. Contractual obligations that are contingent upon the achievement of certain milestones are not included in the table above.

Off-Balance Sheet Arrangements

As of June 30, 2017, we did not have any off-balance sheet financing arrangements and have never established any special purpose entities as defined under SEC Regulation S-K Item 303(a)(4)(ii).

Recent Accounting Pronouncements

For a description of recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on our condensed consolidated financial statements, please see “Note 17 - Recent Accounting Pronouncements” in the Notes to Condensed Consolidated Financial Statements of this Form 10-Q.

41

Table of Contents

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Foreign Currency Risk

A significant portion of our business is conducted in currencies other than the U.S. dollar. Foreign exchange losses have had a material adverse effect on our operating results and cash flows in the past and could have a material adverse effect on our operating results and cash flows in the future. If we do not effectively manage the risks associated with this currency risk, our revenue, cash flows and financial condition could be adversely affected. For example, during 2014, we recorded net foreign exchange losses of $1.0 million, included as part of other income (expense), net in our condensed consolidated statements of operations. Although during 2016 and 2015, we recorded a foreign exchange gain of $232,000 and $717,000, respectively, we cannot guarantee to have the same gain in the future. We incur foreign currency transaction exchange gains and losses due to operations in general. In the future we may experience foreign exchange losses on our non-functional currency denominated receivables and payables to the extent that we have not mitigated our exposure. Foreign exchange losses could have a materially adverse effect on our operating results and cash flows.

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

To partially protect us against fluctuations in foreign currency resulting from accounts receivable in Japanese yen, starting in 2015, we instituted a foreign currency hedging program. We place short term hedges that are intended to offset the potential cash exposure related to fluctuations in the exchange rate between the United States dollar and Japanese yen. We measure the fair value of these hedges at each month end and quarter end using current exchange rates and in accordance with generally accepted accounting principles. At quarter end and year end any foreign currency hedges not settled are netted on the condensed consolidated balance sheet and consolidated balance sheet, respectively, and classified as Level 3 assets and liabilities. As of June 30, 2017 the net change in fair value from the placement of the hedge to settlement at each month end during the quarter had a de minimis impact to the consolidated results.

The functional currency for our foreign operations is the Renminbi, the local currency of China, and in the future we may establish short term hedges covering Renminbi. Most of our operations are conducted in China and most of our costs are incurred in Chinese Renminbi, which subjects us to fluctuations in the exchange rates between the U.S. dollar and the Chinese Renminbi. We incur transaction gains or losses resulting from consolidation of expenses incurred in local currencies for our Chinese subsidiaries, as well as in translation of the assets and liabilities at each balance sheet date. Our financial results could be adversely affected by factors such as changes in foreign currency exchange rates or weak economic conditions in foreign markets, including the revaluation by China of the Renminbi, and any future adjustments that China may make to its currency such as any move it might make to a managed float system with opportunistic interventions. We may also experience foreign exchange losses on our non-functional currency denominated receivables and payables.

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

Table of Contents

Interest Rate Risk

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

Instrument	Balance as of June 30, 2017	Current Interest Rate	Projected Annual Interest Income	Proforma 10% Interest Rate Decline Income	Proforma 10% Interest Rate Increase Income
Cash and cash equivalents	$ 56,483	0.09 %	$ 51	$ 46	$ 56
Investments in marketable debt	31,041	1.86 %	577	519	635
			$ 628	$ 565	$ 691

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

Credit Risk

We perform ongoing credit evaluations of our customers' financial condition, and limit the amount of credit extended when deemed necessary, but generally do not require collateral. The credit risk in our accounts receivable is mitigated by our credit evaluation process and the broad dispersion of sales transactions. One customer accounted for 12% of our accounts receivable balance as of June 30, 2017, while one customer accounted for 13% of our accounts receivable balance as of December 31, 2016.

Equity Risk

As part of our supply chain strategy, we maintain minority investments in privately-held companies located in China either invested directly by us and our wholly-own subsidiary or indirectly through our three consolidated joint venture companies. These minority investments are reviewed for other than temporary declines in value on a quarterly basis. These investments are classified as other assets in the condensed consolidated balance sheets and accounted for under either the equity or cost method, depending on whether we have the ability to exercise significant influence over their operations or financial decisions. We monitor our investments for impairment and record reductions in carrying value when events or changes in circumstances indicate that the carrying value may not be recoverable. Reasons for other than temporary declines in value include whether the related company would have insufficient cash flow to operate for the next twelve months, significant changes in the operating performance and changes in market conditions. As of June 30, 2017 and December 31, 2016, we did not maintain any direct investments under the cost method, our direct minority investments under the equity method totaled $6.2 million and $6.6 million, respectively, and our indirect minority investments by our consolidated joint ventures totaled $4.2 million and $4.7 million, respectively. In aggregate, as of June 30, 2017 and December 31, 2016 the total of our direct and indirect investments in the seven companies under the equity method totaled $10.4 million and $11.3 million, respectively.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the

Table of Contents

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

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

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting was made in the six months ended June 30, 2017 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Table of Contents

PART II. OTHER INFORMATION

Item 1. 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 1A. Risk Factors

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

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

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

Historically silicon wafers or substrates are less expensive than specialty material substrates, such as those that we produce. Electronic circuit designers will generally consider silicon first and only turn to alternative materials if silicon cannot provide the required functionality in terms of power consumption, speed or other specifications. Beginning in 2011, certain applications that had previously used GaAs substrates adopted a new silicon-based technology called Silicon On Insulator, or SOI. SOI technology uses a silicon-insulator-silicon layered substrate in place of conventional silicon substrates in semiconductor manufacturing. SOI substrates cost less than GaAs substrates and, although their performance is not as robust as GaAs substrates in terms of power consumption, heat generation and speed, they became acceptable in mobile phone and other applications that were previously dominated by GaAs substrates. The adoption of SOI resulted in decreased GaAs wafer demand, and decreased revenue. If SOI or similar technologies gain more widespread market acceptance, or are used in more applications, our sales of specialty material based substrates could be reduced and our business and operating results could be significantly and adversely affected.

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

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

We do not control the prices at which our subsidiaries and other joint venture companies sell their raw material products to third parties. However, because we consolidate the results of three of these companies with our own, any reduction in their gross margins could have a significant, adverse impact on our overall gross margins. One or more of our companies has in the past sold, and may in the future sell, raw materials at significantly reduced prices in order to gain volume sales or sales to new customers. In addition, at some points in the last two years, the market price of gallium dropped below our per unit inventory cost and we incurred an inventory write down under the lower of cost or net realizable value accounting rules. In such events, our gross margin may be adversely impacted. In addition, one of our

Table of Contents

consolidated subsidiaries has in the past been subject to capacity constraints requiring it to source product from other third party suppliers in order to meet customer demand, resulting in decreased gross margin and adversely impacting our consolidated gross margin. This joint venture may in the future continue to experience such capacity constraints, causing our gross margin, and consequently our operating results, to be adversely impacted.

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

An important factor in our success is the extent to which we are able to utilize the available capacity in our manufacturing facilities. A number of factors and circumstances may reduce utilization rates, including periods of industry overcapacity, low levels of customer orders, operating inefficiencies, mechanical failures and disruption of operations due to expansion, power interruptions, fire, flood or other natural disasters or calamities. Because many portions of our manufacturing costs are relatively fixed, high utilization rates are critical to our gross margins and operating results. If we fail to achieve acceptable manufacturing volumes or experience product shipment delays, our results of operations will be negatively affected. During periods of decreased demand, we have underutilized our manufacturing lines. If we are unable to improve utilization levels at our facilities during periods of decreased demand and correctly manage capacity, the fixed expense levels will have an adverse effect on our business, financial condition and results of operations. Our gross profit margins have fluctuated from period to period, and these fluctuations are expected to continue in the future. Our gross profit margin had fluctuated from 17.1% for the quarter ended December 31, 2015 to 37.1% in the quarter ended December 31, 2016.

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

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

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

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

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

A current example where yield is of special concern is for our six-inch semi-conducting gallium arsenide substrates, which can be used for manufacturing opto-electronic devices in cell phones, enabling 3-D sensing. This

Table of Contents

application requires very low defect densities, also called etch pit densities, and our yields will be lower than the yields achieved for the same substrate when it will be used in other applications. If we are unable to achieve the targeted quantity of low defect density substrates, then our manufacturing costs would increase and our gross margins would be negatively impacted.

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

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

Risks exist in relocating our gallium arsenide manufacturing operations.

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

The Beijing city government has announced that it will expand its offices into the area where our manufacturing facility is located and we believe the Beijing city government intends to relocate thousands of government employees. The Beijing city government desires to upgrade this area and has applied pressure on manufacturing companies to relocate, including us. We are working with the Beijing city government and we have formed a relocation plan to identify a new manufacturing site, acquire land use rights for such site, construct a facility and move our gallium arsenide production line. We have now identified a manufacturing site and are in the process of negotiating the necessary documents to acquire the land use rights to this site. There can be no assurances that we will successfully complete the negotiations on favorable terms or at all.

The relocation of all or part of our operations requires us to execute our relocation plan and we expect that our major customers will want to examine and qualify the wafer substrates produced at the new site before placing volume purchase orders for products produced at the new site. A failure to properly execute our relocation plan could result in disruption to our production and have a material adverse impact on our revenue and our results of operations and financial condition. If we fail to meet the product qualification requirements of a customer, we may lose sales to that customer and may not have the opportunity to sell future products to that customer. Our reputation may also be damaged. Any loss of sales could have a material adverse effect on our revenue and our results of operations and financial condition. For example, product qualification of our low EPD wafer substrates for 3-D sensing applications will be required and a failure to satisfy all of the qualification standards could result in no orders for this opportunity.

We expect many of the key employees who are employed at our current manufacturing facility to relocate to the new manufacturing site and assist with the transition. There can be no assurances that the key employees will relocate or that we will be able to hire qualified employees for our new manufacturing facility. A loss of key employees and our inability to hire qualified employees for our new manufacturing facility could disrupt our production, which could materially and adversely impact our results of operations and our financial condition.

To date, we have not completed a land use rights purchase of our new manufacturing site. We do not yet have construction bids or third party estimates for the relocation costs of construction costs of our future manufacturing facility, but we currently believe the land use rights purchase amount, relocation costs and facility construction costs will be in the range of $25 million to $35 million, but could be substantially more expensive. There can be no assurances that we may recover some or all of these costs by monetizing the vacated property at our current site in Beijing.

Table of Contents

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

In addition, from time to time, the Chinese government issues new regulations, which may require additional actions on our part to comply. On February 27, 2015, the China State Administration of Work Safety updated its list of hazardous substances. The previous list, which was published in 2002, did not restrict the materials that we use in our wafers. The new list added gallium arsenide. As a result of the newly published list, we were instructed to obtain a permit to continue to manufacture our gallium arsenide substrate wafers. The Beijing municipal authority accepted our permit application in May 2015, but has not issued to us the requisite permit while we continue to make preparations in good faith to relocate our gallium arsenide production. If our application is denied in the future before we complete our relocation, then our gallium arsenide production could be disrupted, which could materially and adversely impact our results of operations and our financial condition.

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

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

On the evening of March 15, 2017 an electrical short-circuit fire occurred at our Beijing manufacturing facility. The electrical power supply supporting 2-inch, 3-inch and 4-inch gallium arsenide and germanium crystal growth was damaged and production in that area was stopped. In addition, a waste water pipe was damaged resulting in a halt to wafer processing for four days until the pipe could be repaired. We were able to rotate key furnace hardware and use some of the 6-inch capacity for smaller diameter crystal growth production to mitigate the impact of the fire and resume production. If we are unable to recover from a fire or natural disaster, our business and operating results could be materially and adversely affected.

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

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

- the competition such manufacturers face in their particular industries;
- the technical, manufacturing, sales, marketing and management capabilities of such manufacturers;
- the financial and other resources of such manufacturers; and

48

· the inability of such manufacturers to sell their products if they infringe third party intellectual property rights.
If demand for the end-user applications for which our products are used decreases, or if manufacturers downstream in our supply chain are unable to develop, market and sell their products, demand for our products will decrease. For example, in the second half of 2016 manufacturers producing and selling passive optical network devices known as EPONs and GPONs experienced a slowdown in demand resulting in surplus inventory on hand. This resulted in a slowdown of sales of our InP substrates. We expect similar cycles of strong demand and then lower demand will occur for various InP, GaAs or Ge substrates in the future.

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

Although the companies in our vertically integrated supply chain have historically made a positive contribution to our financial performance, the average selling prices for many of the raw materials produced have continued to decline and have had a negative impact on our recent financial performance. In particular, the average selling prices for 4N gallium and for germanium have been driven down by oversupply and, in the second half of 2015, 2016 and continuing into 2017, negatively impacted our financial results. In 2016, the seven companies accounted for under the equity method of accounting contributed a loss of $2.0 million to our financial statements. Low selling prices for raw materials continue and will have a detrimental impact on our 2017 financial performance. There can be no assurance that the oversupply will be corrected by the market. Further, in several quarters over the past two years, one of our consolidated subsidiaries incurred a lower of cost or net realizable value inventory write down, which negatively impacted our consolidated gross margin. In the first quarter of 2017 we incurred an impairment charge of $313,000 against one of our partially owned suppliers, writing down our investment to zero value. If the pricing environment remains stressed by oversupply and our joint venture companies cannot reduce their production cost, then the reduced average selling prices of the raw materials produced by our joint venture companies will have a continuing adverse impact on our revenue, gross margins and net profit.

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

We have invested in 10 subsidiaries and joint venture companies in China that produce materials including 99.99% pure gallium (4N Ga), high purity gallium (7N Ga), arsenic, germanium, germanium dioxide, pyrolytic boron nitride (pBN) crucibles and boron oxide (B2O3). We purchase a portion of the materials produced by these companies for our use and they sell the remainder of their production to third parties. Our ownership and the ownership held by our consolidated subsidiaries in these entities ranges from 20% to 83%. We consolidate the companies in which we have a majority or controlling financial interest and employ equity accounting for the companies in which we have a smaller ownership interest. Several of these companies occupy space within larger facilities owned and/or operated by one of the other venture partners. Several of these venture partners are engaged in other manufacturing activities at or near the same facility. In some facilities, we share access to certain functions, including water, hazardous waste treatment or air quality treatment. If any of our joint venture partners in any of these ventures experiences problems with its operations, disruptions of our joint venture operations could result, having a material adverse effect on the financial condition and results of operation of our joint venture companies, and correspondingly on our financial condition or results of operations. For example, since gallium is a by-product of aluminum, our raw gallium joint venture in China, which is housed in and receives services from an affiliated aluminum plant, could generate lower production of gallium as a result of reduced services provided by the aluminum plant. Accordingly, in order to meet customer supply obligations, our supply chain may have to source materials from another independent third party supplier, resulting in reduced gross margin.

In addition, if any of our joint ventures or venture partners with which our joint ventures share facilities is deemed to have violated applicable laws, rules or regulations governing the use, storage, discharge or disposal of hazardous chemicals during manufacturing, research and development or sales demonstrations, the operations of our joint ventures could be adversely affected and we could be subject to substantial liability for clean-up efforts, personal injury and fines or suspension or cessation of our joint venture operations as a result of the actions of the joint ventures

Table of Contents

or other venture partners. Employees working for our joint ventures or any of the other venture partners could bring litigation against us as a result of actions taken at the joint venture or venture partner facilities, even though we are not directly controlling the operations, including actions for exposure to chemicals or other hazardous materials at the facilities of our joint ventures or the facilities of any venture partner that are shared by our joint ventures. While we would expect to defend ourselves vigorously in any litigation that is brought against us, litigation is inherently uncertain and it is possible that our business, financial condition, results of operations or cash flows could be affected. Even if we are not deemed responsible for the actions of the joint ventures or venture partners, litigation could be costly, time consuming to defend and divert management attention; in addition, if we are deemed to be the most financially viable of the partners, plaintiffs may decide to pursue us for damages.

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

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

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

The markets for our products are intensely competitive. We face competition for our substrate products from other manufacturers of substrates, such as Freiberger, JX, Umicore, Sumitomo and CCTC and from companies, such as Qorvo and Skyworks, that are actively considering 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 technology. Other competitors may develop and begin using similar technology. Sumitomo and JX also compete with us in the InP market. If we are unable to compete effectively, our revenue may not increase and we may not achieve profitability. We face many competitors that have a number of significant advantages over us, including:

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

Table of Contents

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

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

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

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

Since the market for our products is characterized by declining average selling prices resulting from various factors, such as increased competition, overcapacity, the introduction of new products and decreased sales of products incorporating our products, the average selling prices for our products may decline over relatively short time periods. We have in the past experienced, and in the future may experience, substantial period-to-period fluctuations in operating results due to declining average selling prices. For example, for the year ended December 31, 2016, we experienced an average selling price decline of our substrate selling prices of approximately 5% to 10%, depending on the substrate product. It is possible that the pace of the decline of average selling prices could accelerate beyond these levels for certain products in a commoditizing market. We anticipate that average selling prices will decrease in the future in response to the unstable demand environment, product introductions by competitors or us, or by other factors, including pricing pressures from significant customers. When our average selling prices decline, our revenue and gross profit decline, unless we are able to sell more products or reduce the cost to manufacture our products. We generally attempt to combat an average selling price decline by improving yields and manufacturing efficiencies 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 selling 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 work to reduce the cost of manufacturing our products. There is no assurance that any changes effected by us will result in sufficient cost reductions to allow us to reduce the price of our products to remain competitive or improve our gross margins.

Defects in our products could diminish demand for our products.

Our products are complex and may contain defects, including defects resulting from impurities inherent in our raw materials or inconsistencies in our manufacturing processes. We have experienced quality control problems with some of our products, which caused customers to return products to us, reduce orders for our products, or both. If we experience quality control problems, or experience these or other problems in new products, customers may cancel or reduce orders or purchase products from our competitors and we may be unable to maintain or increase sales to our customers and sales of our products could decline. Defects in our products could cause us to incur higher manufacturing costs and suffer product returns and additional service expenses, all of which could adversely impact our operating results. If new products developed by us contain defects when released, our customers may be dissatisfied and we may suffer negative publicity or customer claims against us, lose sales or experience delays in market acceptance of our new products.

Our substrate products have a long qualification cycle that makes it difficult to forecast our revenue.

New customers typically place orders with us for our substrate products three months to a year or more after our initial contact with them. In addition, existing customers may be slow to purchase our products. The sale of our products is subject to our customers' lengthy internal evaluation and approval 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, our operating results would be adversely affected. In addition, if we fail to meet the product qualification requirements of the customer, we may not have another opportunity to sell that product to that customer for many months or even years. In the current competitive climate, the average qualification and sales cycle for our products has lengthened even further and is expected to continue to make it difficult for us to forecast our future sales accurately. We anticipate that sales of any future substrate products will also have lengthy qualification periods and will, therefore, be subject to risks substantially similar to those inherent in the lengthy sales cycles of our current substrate products.

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

From time to time, sales to one or more of our customers individually represent more than 10% of our revenue and if we were to lose a major customer, the loss would negatively impact our revenue. 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 a slowdown in bookings, significant push-outs and cancellation of orders from customers. If we lose a major customer or if a customer cancels, reduces or delays orders, or reduces the prices paid for our products, our revenue would decline. In addition, customers that have accounted for significant revenue in the past may not continue to generate revenue for us in any future period. Any loss of customers or any delay in scheduled shipments of our products could cause revenue to fall below our expectations and the expectations of market analysts or investors, causing our stock price to decline.

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

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

Our continuing business depends in significant part upon manufacturers of electronic and opto-electronic compound semiconductor devices, as well as the current and anticipated market demand for these devices and products using these devices. As a supplier to the compound semiconductor industry, we are subject to the business cycles that characterize the industry. The timing, length and volatility of these cycles are difficult to predict. The compound semiconductor industry has historically been cyclical due to sudden changes in demand, the amount of manufacturing capacity and changes in the technology employed in compound semiconductors. The rate of changes in demand, including end demand, is high, and the effect of these changes upon us occurs quickly, exacerbating the volatility of these cycles. These changes have affected the timing and amounts of customers' purchases and investments in new technology. These industry cycles create pressure on our revenue, gross margin and net income.

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

We base our planned operating expenses in part on our expectations of future revenue, and a significant portion of our expense is relatively fixed. If revenue for a particular quarter is lower than we expect, we likely will be unable to proportionately reduce our operating expenses for that quarter, which would harm our operating results.

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

Our success depends on our ability to offer new products, including larger diameter substrates, low defect density substrates, thicker or thinner substrates, substrates with extreme surface flatness specifications, substrates that are manufactured with a doped crystal growth process or substrates that incorporate leading technology and other technological advances. In addition, our new products must meet customer needs and compete effectively on quality, price and performance. The markets for our products are characterized by rapid technological change, changing customer needs and evolving industry standards. If our competitors introduce products employing new technologies or performance characteristics, our existing products could become obsolete and unmarketable. During the past few years, we have seen our competitors selling more substrates manufactured using a crystal growth technology similar to ours, which has eroded our technological differentiation.

The development of new products can be a highly complex process, and we may experience delays in developing and introducing new products. Any significant delay could cause us to fail to timely introduce and gain market acceptance of new products. Further, the costs involved in researching, developing and engineering new products could be greater than anticipated. If we fail to offer new products or product enhancements or fail to achieve higher quality products, we may not generate sufficient revenue to offset our development costs and other expenses or meet our customers' requirements.

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 direct investments or investments through our subsidiaries in ten 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 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. As a result of sharp declines in the average selling prices of raw materials in 2016 the seven companies accounted for under the equity method of accounting contributed a loss of $2.0 million to our financial statements. In the first quarter of 2017, we incurred an impairment charge of $313,000 against one of our partially owned suppliers, writing down our investment to zero value.

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 subsidiaries and joint ventures, we sometimes experienced delays obtaining critical raw materials and spare parts, including gallium and we could experience such delays again in the future due to shortages of materials or for other reasons and may be unable to obtain an adequate supply of materials. Delays in receiving equipment or materials could result in higher 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.

Table of Contents

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

Although we are not currently pursuing additional joint ventures, in the future, we might invest in additional joint ventures in order to remain competitive in our marketplace and ensure a supply of critical raw materials. However, we may not be able to identify additional complementary joint venture opportunities or, even once opportunities are identified, we may not be able to reach agreement on the terms of the business venture with the other 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.

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

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

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

Many of our customers may be undercapitalized and cope with cash flow issues. Because of competitive market conditions, we frequently grant our customers extended payment terms when selling products to them. Subsequent to our shipping a product, some customers have been unable to make payments when due, reducing our cash balances and causing us to incur charges to allow for a possibility that some accounts might not be paid. Customers may also be forced to file for bankruptcy. If our customers do not pay their accounts we will be required to incur charges that would reduce our earnings.

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

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

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

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

Table of Contents

net realizable value valuation rule. We have in the past had to take inventory valuation and impairment charges. Any future unexpected changes in demand or increases in costs of production that cause us to take additional charges for un-saleable, obsolete or excess inventory, or to reduce inventory values, could adversely affect our results of operations.

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

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

- increased volatility in our stock price;
- increased volatility in foreign currency exchange rates;
- delays in, or curtailment of, purchasing decisions by our customers or potential customers either as a result of overall economic uncertainty or as a result of their inability to access the liquidity necessary to engage in purchasing initiatives;
- increased credit risk associated with our customers or potential customers, particularly those that may operate in industries most affected by the economic downturn; and
- impairment of our intangible or other assets.

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

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

Future tightening of credit markets and concerns regarding the availability of credit may make it more difficult for our customers to raise capital, whether debt or equity, to finance their purchases of capital equipment or of the products we sell. Delays in our customers’ ability to obtain such financing, or the unavailability of such financing, would

Table of Contents

adversely affect our product sales and revenues and therefore harm our business and operating results. We cannot predict the timing, duration of or effect on our business of any future economic downturn or the timing or strength of any subsequent recovery.

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

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

II Risks Related to International Aspects of Our Business

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

Our revenue growth depends in part on the expansion of our international sales and operations. Typically over 80% of our revenue is from international sales. We expect that sales to customers outside the United States, particularly sales to customers in Japan, Taiwan and China, will continue to represent a significant portion of our revenue.

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

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

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

Our sales are denominated in U.S. dollars, except for sales to our Chinese customers which are denominated in Renminbi and our Japanese customers which are denominated in Japanese yen. Increases in the value of the U.S. dollar

56

could increase the price of our products in non-U.S. markets and make our products more expensive than competitors' products in these markets.

Denominating some sales in Japanese yen subjects us to fluctuations in the exchange rates between the U.S. dollar and the Japanese yen. For example, in the second half of 2014, the exchange rate of Japanese yen to U.S. dollar moved from 101.55 to 119.95 from June 30, 2014 to December 31, 2014. As a result, in 2014 we incurred foreign currency transaction exchange losses which are included in "other income (expense), net" on the condensed consolidated statements of operations of $1.0 million.

The functional currency of our Chinese subsidiary and joint ventures is the local currency. If we do not effectively manage the risks associated with international sales, our revenue, cash flows and financial condition could be adversely affected. We incur transaction gains or losses resulting from the purchase and sale activities denominated in foreign currencies other than functional currencies at the respective consolidated entities. We accumulate translation gain or losses resulting from marking certain balance sheet assets and liabilities to the current market rate for those consolidated entities whose functional currencies are other than the reporting currency, which are recorded as component of "Accumulated other comprehensive income" on the condensed consolidated balance sheets. Although we have instituted a foreign currency hedging program, we still experience losses and gains on foreign exchange from time to time.

Uncertainty regarding the United States' foreign policy under the new administration could disrupt our business.

We manufacture our substrates in China and, in 2016, approximately 90% of our sales are to customers located outside of the United States. Further, we have partial ownership of 10 companies in China as part of our supply chain. The United States' foreign policy under the new administration could create uncertainty and caution in the international business community, resulting in possible disruptions in manufacturing, import/export, trade tariffs, sales, investments or other business activity. Such disruptions could have an adverse impact on our financial performance.

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

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

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

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

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

Our financial performance may be affected by changes in China's political, social, regulatory or economic environments. The role of the Chinese central and local governments in the Chinese economy is significant. Chinese

57

Table of Contents

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

The Beijing city government has announced that it will expand its offices into the area where our manufacturing facility is located and we believe the Beijing city government intends to relocate thousands of government employees. The Beijing city government desires to upgrade this area and has applied pressure on manufacturing companies to relocate, including us. We are working with the Beijing city government and we have formed a relocation plan to identify a new manufacturing site, acquire land use rights, construct a facility and move our gallium arsenide production line. We have now identified a new manufacturing site and are in the process of negotiating the necessary documents to acquire the land use rights to this site. We intend to complete this relocation by the end of 2018 or the first half of 2019.

The relocation of all or part of our operations requires us to develop and execute our relocation plan. A failure to properly execute our relocation plan could result in disruption to our production and have a material adverse impact on our revenue and our results of operations and financial condition.

Our international operations are exposed to potential adverse tax consequence in China.

Our international operations create a risk of potential adverse tax consequences. Taxes on income in our China-based companies are dependent upon acceptance of our operational practices and intercompany transfer pricing by local tax authorities as being on an arm's length basis. Due to inconsistencies among taxing authorities in application of the arm's length standard, transfer pricing challenges by tax authorities could, if successful, materially increase our consolidated income tax expense. We are subject to tax audits in China and an audit could result in the assessment of additional income tax against us. This could have a material adverse effect on our operating results or cash flows in the period or periods for which that determination is made and could result in increases to our overall tax expense in subsequent periods. Various taxing agencies in China are increasingly focused on tax reform and other legislative action to increase tax revenue. In addition to risks regarding income tax we have in the past been retroactively assessed value added taxes (“VAT” or sales tax) and such VAT assessments could occur again in the future.

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

In the past, China has faced power shortages resulting in power demand outstripping supply in peak periods. Instability in electrical supply has caused sporadic outages among residential and commercial consumers causing the Chinese government to implement tough measures to ease the energy shortage. If further problems with power shortages occur in the future, we may be required to make temporary closures of our operations or of our subsidiary and joint venture operations. We may be unable to manufacture our products and would then be unable to meet customer orders except from inventory on hand. As a result, our revenue could be adversely impacted, and our relationships with our customers could suffer, impacting our ability to generate future revenue. In addition, if power is shut off at any of our facilities at any time, either voluntarily or as a result of unplanned brownouts, during certain phases of our manufacturing process including our crystal growth phase, the work in process may be ruined and rendered unusable, causing us to incur costs that will not be covered by revenue, and negatively impacting our cost of revenue and gross margins.

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

Any reoccurrence of SARS or an outbreak of a contagious disease, such as Avian Flu or Ebola, may cause us to temporarily close our manufacturing operations. Similarly, if one or more of our key suppliers is required to close for an

Table of Contents

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

III Risks Related to Our Financial Results and Capital Structure

We may utilize our cash balances for relocation, expansion, or to offset a business downturn resulting in the decline of our existing cash, cash equivalents and investment balances, and if we need additional capital, those funds may not be available on acceptable terms, or at all.

Our liquidity is affected by many factors including, among others, our plans to secure land use rights and construct a new facility for the relocation of our gallium arsenide manufacturing operations, the extent to which we pursue on-going capital expenditures, the level of our production, the level of profits or losses, and other factors related to the uncertainties of the industry and global economies. Our relocation expenditures and any negative cash flow effects of these other factors will draw down our cash reserves, which could adversely affect our financial condition, reduce our value and possibly impinge our ability to raise debt and equity funding in the future, at a time when we might need to raise additional cash or elect to raise additional cash. Accordingly, there can be no assurance that events 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.

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

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

- our ability to develop, manufacture and deliver high quality products in a timely and cost-effective manner;
- disruptions during the relocation of our gallium arsenide product line;
- fluctuation of our manufacturing yields;
- decreases in the prices of our or our competitors' products;
- fluctuations in demand for our products;
- the volume and timing of orders from our customers, and cancellations, push-outs and delays of customer orders once booked;
- decline in general economic conditions or downturns in the industry in which we compete;
- expansion of our manufacturing capacity;
- expansion of our operations in China;
- limited availability and increased cost of raw materials;
- costs incurred in connection with any future acquisitions of businesses or technologies; and

Table of Contents

- increases in our expenses, including expenses for research and development.

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

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

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

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

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

Our board of directors has the authority to issue up to 800,000 shares of preferred stock in addition to the outstanding shares of Series A preferred stock and to determine the price, rights, preferences and privileges of those shares without any further vote or action by the stockholders. The rights of the holders of common stock will be subject to, and may be adversely affected by, the rights of the holders of any preferred stock that may be issued in the future. The issuance of shares of preferred stock could have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock. We have no present intention to issue additional shares of preferred stock.

Provisions in our 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:

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

Table of Contents

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 in the over-the-counter market and be quoted on a service such as those provided by OTC Markets Group, 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 customers, suppliers and employees, the loss of institutional investor interest and fewer business development opportunities, as well as the loss of liquidity for our stockholders.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

As of December 31, 2016, we had U.S. federal net operating loss carryforwards of approximately $178.4 million and state net operating loss carryforwards of approximately $1.0 million, which begin expiring in varying amounts from 2017 through 2022 if unused. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change," the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes, such as research tax credits, to offset its post-change income and taxes may be limited. In general, an "ownership change" occurs if there is a cumulative change in our ownership by "5% shareholders" that exceeds 50 percentage points over a rolling three-year period. Similar rules may apply under state tax laws. We may have undergone prior ownership changes, and we may undergo ownership changes in the future, which may result in limitations on our net operating loss carryforwards and other tax attributes. Any such limitations on our ability to use our net operating loss carryforwards and other tax attributes could adversely impact our business, financial condition and results of operations.

IV. Risks Related to Our Intellectual Property

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

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

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

We rely on a combination of patents, copyrights, trademarks, trade secrets and trade secret laws, non-disclosure agreements and other intellectual property protection methods to protect our proprietary technology. We believe that our internal, non-patented proprietary process technology methods, systems and processes are a valuable and critical element of our intellectual property. We must establish and maintain safeguards to avoid the theft of these processes. 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

Table of Contents

ship GaAs substrates produced using a process similar to our VGF process. Our competitors may also develop and patent improvements to the VGF technology upon which we rely, and thus may limit any exclusivity we enjoy by virtue of our patents or trade secrets.

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

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

V Risks Related to Compliance, Other Legal and Administrative Matters

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

We are subject to federal, state and local environmental and safety laws and regulations in all of our operating locations, including laws and regulations of China, such as laws and regulations related to the development, manufacture and use of our products, the use of hazardous materials, the operation of our facilities, and the use of our real property. These laws and regulations govern the use, storage, discharge and disposal of hazardous chemicals during manufacturing, research and development, and sales demonstrations. If we fail to comply with applicable regulations, we could be subject to substantial liability for clean-up efforts, personal injury, 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.

In addition, from time to time, the Chinese government issues new regulations, which may require additional actions on our part to comply. On February 27, 2015, the China State Administration of Work Safety updated its list of hazardous substances. The previous list, which was published in 2002, did not restrict the materials that we use in our wafers. The new list added gallium arsenide. As a result of the newly published list, we were instructed to obtain a permit to continue to manufacture our gallium arsenide substrate wafers. The Beijing municipal authority accepted our permit application in May 2015, but has not yet issued to us the requisite permit while we continue to make preparations in good faith to relocate our gallium arsenide production. If our application is denied in the future before we complete our relocation, then our gallium arsenide production could be disrupted, which could materially and adversely impact our results of operations and our financial condition.

For example, in 2005, a complaint was filed against us alleging personal injury, general negligence, intentional tort, wage loss and other damages, including punitive damages, as a result of exposure of plaintiffs to high levels of gallium arsenide in gallium arsenide wafers, and methanol. Other current and/or former employees could bring litigation against us in the future. Although we have 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.

Table of Contents

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.

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.

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

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

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

Not applicable.

Item 3. Defaults upon Senior Securities

None

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None

Table of Contents

Item 6. Exhibits

a. Exhibits

Exhibit Number	Description
31.1	Certification by Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification by Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification by Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification by Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance.
101.SCH	XBRL Taxonomy Extension Schema.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase.
101.DEF	XBRL Taxonomy Extension Definition Linkbase.
101.LAB	XBRL Taxonomy Extension Label Linkbase.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase.

Table of Contents

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

	AXT, INC.	
Dated: August 4, 2017	By:	/s/ MORRIS S. YOUNG Morris S. Young Chief Executive Officer (Principal Executive Officer)
		/s/ GARY L. FISCHER Gary L. Fischer Chief Financial Officer and Corporate Secretary (Principal Financial Officer and Principal Accounting Officer)

Table of Contents

EXHIBIT INDEX

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