AXT INC
Form 10-Q
May 04, 2018
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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 March 31, 2018

Or

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

for the transition period from to

Commission File Number 000-24085

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 Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check-mark whether the registrant has submitted electronically and posted on its 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 May 1, 2018
Common Stock, $0.001 par value	39,438,267

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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements (unaudited)

AXT, INC.

CONDENSED CONSOLIDATED BALANCE SHEETS

(Unaudited, in thousands, except per share data)

	March 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 39,189	$ 44,352
Short-term investments	15,195	20,032
Accounts receivable, net of allowances of $515 and $527 as of March 31, 2018 and December 31, 2017	21,347	22,778
Inventories	51,122	45,840
Prepaid expenses and other current assets	6,704	7,519
Total current assets	133,557	140,521
Long-term investments	12,511	12,576
Property, plant and equipment, net	58,763	46,530
Other assets	11,476	11,573
Total assets	$ 216,307	$ 211,200
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 12,049	$ 11,445
Accrued liabilities	9,190	11,149
Total current liabilities	21,239	22,594
Other long-term liabilities	329	289
Total liabilities	21,568	22,883
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 March 31, 2018 and December 31, 2017 (Liquidation preference of $6,861 and $6,819 as of March 31, 2018 and December 31, 2017)	3,532	3,532
Common stock, $0.001 par value; 70,000 shares authorized; 39,438 and 39,413 shares issued and outstanding as of March 31, 2018 and December 31, 2017	39	39
Additional paid-in capital	232,212	231,679
Accumulated deficit	(51,962)	(54,837)

Accumulated other comprehensive income	5,846	3,407
Total AXT, Inc. stockholders' equity	189,667	183,820
Noncontrolling interests	5,072	4,497
Total stockholders' equity	194,739	188,317
Total liabilities and stockholders' equity	$ 216,307	$ 211,200

See accompanying notes to condensed consolidated financial statements.

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AXT, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

(Unaudited, in thousands, except per share data)

	Three Months Ended March 31,	
	2018	2017
Revenue	$ 24,419	$ 20,616
Cost of revenue	14,846	14,328
Gross profit	9,573	6,288
Operating expenses:		
Selling, general and administrative	4,222	3,793
Research and development	1,420	1,124
Total operating expenses	5,642	4,917
Income from operations	3,931	1,371
Interest income, net	142	98
Equity in loss of unconsolidated joint ventures	(334)	(933)
Other (expense) income, net	(215)	48
Income before provision for income taxes	3,524	584
Provision for income taxes	334	159
Net income	3,190	425
Less: Net (income) loss attributable to noncontrolling interests	(315)	240
Net income attributable to AXT, Inc.	$ 2,875	$ 665
Net income attributable to AXT, Inc. per common share:		
Basic	$ 0.07	$ 0.02
Diluted	$ 0.07	$ 0.02
Weighted-average number of common shares outstanding:		
Basic	38,941	34,210
Diluted	40,364	35,624

See accompanying notes to condensed consolidated financial statements.

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AXT, INC.

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(Unaudited, in thousands)

	March 31, 2018	2017
Net income	$ 3,190	$ 425
Other comprehensive income, net of tax:		
Change in foreign currency translation gain, net of tax	2,816	475
Change in unrealized loss on available-for-sale investments, net of tax	(117)	(123)
Total other comprehensive income, net of tax	2,699	352
Comprehensive income	5,889	777
Less: Comprehensive (income) loss attributable to noncontrolling interests	(575)	185
Comprehensive income attributable to AXT, Inc.	$ 5,314	$ 962

See accompanying notes to condensed consolidated financial statements.

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AXT, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(Unaudited, in thousands)

	Three Months Ended March 31,			
	2018		2017	
Cash flows from operating activities:				
Net income	$ 3,190		$ 425	
Adjustments to reconcile net income to net cash provided by operating activities:				
Depreciation and amortization	1,070		1,140	
Amortization of marketable securities premium	43		27	
Impairment charge on equity investee	—		313	
Stock-based compensation	467		312	
Realized gain on sale of available-for-sale securities	—		(77)	
Loss from equity method investments, net	334		620	
Changes in operating assets and liabilities:				
Accounts receivable	1,686		(3,156)	
Inventories	(4,553)		1,065	
Prepaid expenses and other current assets	993		318	
Other assets	(64)		246	
Accounts payable	334		1,424	
Accrued liabilities	(2,096)	*	(1,373)	*
Other long-term liabilities, including royalties	191		(211)	
Net cash provided by operating activities	1,595		1,073	
Cash flows from investing activities:				
Purchases of property, plant and equipment	(11,849)		(268)	
Purchases of available-for-sale securities	(9,938)		(21,716)	
Proceeds from sales and maturities of available-for-sale securities	14,680		8,970	
Net cash used in investing activities	(7,107)		(13,014)	
Cash flows from financing activities:				
Proceeds from issuance of common stock and options exercised, net of issuance costs	66		32,675	
Dividends paid by joint ventures to their minority shareholders	—		(465)	
Net cash provided by financing activities	66		32,210	
Effect of exchange rate changes on cash and cash equivalents	283		91	
Net increase (decrease) in cash and cash equivalents	(5,163)		20,360	
Cash and cash equivalents at the beginning of the period	44,352		36,152	
Cash and cash equivalents at the end of the period	$ 39,189		$ 56,512	

* Dividend accrued but not paid by one of our consolidated subsidiaries of $552 and $503 was included in accrued liabilities as of March 31, 2018 and 2017, respectively.

See accompanying notes to condensed consolidated financial statements.

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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 months ended March 31, 2018 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 2017 Annual Report on Form 10-K filed with the Securities and Exchange Commission (the "SEC") on March 9, 2018.

The condensed consolidated financial statements include the accounts of AXT, our wholly-owned subsidiaries, Beijing Tongmei Xtal Technology Co., Ltd., Baoding Tongmei Xtal Technology Co., Ltd. and Chaoyang Tongmei Xtal Technology Co., 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. We have seven companies accounted for by the equity method. For subsidiaries that we consolidate, we reflect the portion we do not own as noncontrolling interests on our condensed consolidated balance sheets in stockholders' equity and in our condensed consolidated statements of operations.

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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 March 31, 2018 and December 31, 2017, our cash, cash equivalents and investments are classified as follows (in thousands):

	March 31, 2018				December 31, 2017			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized (Loss)	Fair Value	Amortized Cost	Gross Unrealized Gain	Gross Unrealized (Loss)	Fair Value
Classified as:								
Cash	$ 39,189	$ —	$ —	$ 39,189	$ 43,610	$ —	$ —	$ 43,610
Cash equivalents:								
Certificates of deposit 1	—	—	—	—	742	—	—	742
Total cash and cash equivalents	39,189	—	—	39,189	44,352	—	—	44,352
Investments (available-for-sale):								
Certificates of deposit 2	7,340	—	(41)	7,299	7,099	—	(24)	7,075
Corporate bonds	20,576	—	(169)	20,407	25,602	—	(69)	25,533
Total investments	27,916	—	(210)	27,706	32,701	—	(93)	32,608
Total cash, cash equivalents and investments	$ 67,105	$ —	$ (210)	$ 66,895	$ 77,053	$ —	$ (93)	$ 76,960
Contractual maturities on investments:								
Due within 1 year 3	$ 15,288			$ 15,195	$ 20,056			$ 20,032
Due after 1 through 5 years 4	12,628			12,511	12,645			12,576
	$ 27,916			$ 27,706	$ 32,701			$ 32,608

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. 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 and our cash proceeds from sales of available-for-sale investments were $125,000. Our cost was $48,000 and our gross realized gain from sales of available-for-sale investments was $77,000. There were no GHI transactions in the three months ended March 31, 2018. As of March 31, 2017, we no longer hold any GHI stock.

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 March 31, 2018 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.

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A portion of our investments would generate a loss if we sold them on March 31, 2018. 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 March 31, 2018 (in thousands):

	In Loss Position < 12 months		In Loss Position > 12 months		Total In Loss Position	
As of March 31, 2018	Fair Value	Gross Unrealized (Losses)	Fair Value	Gross Unrealized (Losses)	Fair Value	Gross Unrealized (Losses)
Investments:						
Certificates of deposit	$ 4,935	$ (35)	$ 2,344	$ (6)	$ 7,279	$ (41)
Corporate bonds	13,153	(107)	7,254	(62)	20,407	(169)
Total in loss position	$ 18,088	$ (142)	$ 9,598	$ (68)	$ 27,686	$ (210)

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, 2017 (in thousands):

	In Loss Position < 12 months		In Loss Position > 12 months		Total In Loss Position	
As of December 31, 2017	Fair Value	Gross Unrealized (Loss)	Fair Value	Gross Unrealized (Loss)	Fair Value	Gross Unrealized (Loss)
Investments:						
Certificates of deposit	$ 3,994	$ (16)	$ 2,342	$ (8)	$ 6,336	$ (24)
Corporate bonds	25,533	(69)	—	—	25,533	(69)
Total in loss position	$ 29,527	$ (85)	$ 2,342	$ (8)	$ 31,869	$ (93)

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 $9.7 million and $9.8 million as of March 31, 2018 and December 31, 2017, respectively. As of March 31, 2018, there were seven companies accounted for under the equity method. There were no impairment

charges in the three months ended March 31, 2018. The three months ended March 31, 2017 include an impairment charge of $313,000 for one of the gallium companies. During the first quarter of 2017, management determined that it was unlikely that this company would recover from the difficult pricing environment and we had written the investment down to zero.

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

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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 March 31, 2018, 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 months ended March 31, 2018. There have been no transfers between fair value measurements levels during the three months ended March 31, 2018.

The following table summarizes our financial assets and liabilities measured at fair value on a recurring basis in accordance with ASC 820 as of March 31, 2018 (in thousands):

	Balance as of March 31, 2018	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	$ 7,299	$ —	$ 7,299	$ —
Corporate bonds	20,407	—	20,407	—
Total	$ 27,706	$ —	$ 27,706	$ —

The following table summarizes our financial assets and liabilities measured at fair value on a recurring basis in accordance with ASC 820 as of December 31, 2017 (in thousands):

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

	December 31, 2017	(Level 1)	(Level 2)	(Level 3)
Assets:				
Cash equivalents and investments:				
Certificates of deposit	$ 7,817	$ —	$ 7,817	$ —
Corporate bonds	25,533	—	25,533	—
Total	$ 33,350	$ —	$ 33,350	$ —

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 March 31, 2018. The three months ended March 31, 2017 include an impairment charge of $313,000 for one of the gallium companies. During the first quarter of 2017, management determined that it was unlikely that this company would 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 months ended March 31, 2018 and 2017.

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Note 3. Inventories

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

	March 31, 2018	December 31, 2017
Inventories:		
Raw materials	$ 25,626	$ 23,554
Work in process	23,805	20,135
Finished goods	1,691	2,151
	$ 51,122	$ 45,840

As of March 31, 2018 and December 31, 2017, carrying values of inventories were net of inventory reserves of $13.7 million and $13.3 million, respectively, for excess and obsolete inventory and $322,000 and $291,000, 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):

	March 31, 2018	December 31, 2017
Property, plant and equipment:		
Machinery and equipment, at cost	$ 45,954	$ 44,549
Less: accumulated depreciation and amortization	(42,217)	(40,845)
Building, at cost	33,635	32,461
Less: accumulated depreciation and amortization	(12,234)	(11,501)
Leasehold improvements, at cost	5,715	5,539
Less: accumulated depreciation and amortization	(4,538)	(4,288)
Construction in progress	32,448	20,615
	$ 58,763	$ 46,530

As of March 31, 2018, the balance of construction in progress was $32.4 million of which $22.8 million was related to our buildings in our new Dingxing and Chaoyang locations, $5.6 million was for manufacturing equipment purchases and $4.0 million was from our construction in progress for our other consolidated subsidiaries. As of December 31,

2017, the balance of construction in progress was $20.6 million, of which, $14.8 million was for our buildings in our new Dingxing location, $3.6 million was for manufacturing equipment purchases not yet placed in service, and $2.2 million was for our construction in progress at our other consolidated subsidiaries.

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Note 5. Accrued Liabilities

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

	March 31, 2018	December 31, 2017
Preferred stock dividends payable	$ 2,901	$ 2,901
Accrued compensation and related charges	2,058	3,205
Advances from customers	1,061	924
Dividends payable by consolidated joint ventures	552	533
Current portion of royalty payments	431	575
Accrued income taxes	375	270
Accrued professional services	251	570
Other tax payable	215	395
Other personnel related costs	213	230
Accrued product warranty	117	133
Other accrued liabilities	1,016	1,413
	$ 9,190	$ 11,149

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 March 31, 2018 and December 31, 2017, we included $1.1 million and $1.2 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. The general manager of JiYa has a family member who has a 10% ownership position in this equity investment entity. As of March 31, 2018 and December 31, 2017, amounts payable of $2.1 million were included in “Accounts payable” in our condensed consolidated balance sheets.

JiYa also sells raw materials to one of its equity investment entities for production in the ordinary course of business. As of March 31, 2018 and December 31, 2017, amounts receivable of $346,000 and $334,000, 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 made on credit to the customer and, as of March 31, 2018, 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 the three months ended March 31, 2018 and 2017, JinMei has recorded $0 and $1,000, respectively, income from agency sales, 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.

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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. During 2017, the repayment of the full amount of principal and interest totaling $114,000 was received by our wholly owned subsidiary.

In April 2014, Tongmei loaned an additional $46,000 to Dongfang. The loan bears interest at 6.15% per annum and was due on December 31, 2017. During 2017, the repayment of the full amount of principal and interest totaling $55,000 was received by our wholly owned subsidiary.

Tongmei also purchases raw materials from Dongfang for production in the ordinary course of business. As of March 31, 2018 and December 31, 2017, amounts payable of $381,000 and $0, respectively, were included in "Accounts payable" in our condensed consolidated balance sheets.

Tongmei also 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 March 31, 2018 and December 31, 2017, amounts payable of $400,000 and $370,000, 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 March 31, 2018 and December 31, 2017, amounts payable of $497,000 and $219,000, respectively, were included in "Accounts payable" in our condensed consolidated balance sheets.

In July 2017, Tongmei, provided an inter-company loan to JinMei in the amount of $768,000 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 in three installments between December 2021 and December 2023. 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 are expected to be approximately $6 million.

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 officer'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 was received by our consolidated joint venture. In November 2017, BoYu provided another personal loan of $318,000 to the same executive employee. The loan bears interest at 2.75% per annum. Principal and accrued interest are due on November 30, 2020. As of March 31, 2018 and December 31, 2017,

the balances, including both principal and accrued interest, were $318,000 and $307,000, respectively, and included in “Other assets” in our condensed consolidated balance sheets.

Beijing Kaide Quartz Co. Ltd. (“Kaide”) has been a supplier of customized quartz tubes to AXT 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 March 31, 2018 and December 31, 2017, amounts payable to Kaide of $693,000 and $708,000, respectively, were included in “Accounts payable” in our condensed consolidated balance sheets.

On November 2, 2017, our consolidated joint venture, BoYu, raised additional capital in the amount of $2 million in cash from a third-party investor through the issuance of shares equivalent to 10% ownership of BoYu. This third-party investor is an immediate family member of the owner of one of BoYu's customers. For the three months ended March 31, 2018 and 2017, BoYu has recorded $801,000 and $337,000, respectively, in revenue from this

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customer. As of March 31, 2018 and December 31, 2017, amounts receivable of $969,000 and $635,000, respectively, were included in “Accounts receivable” 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.

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	March 31, 2018	December 31, 2017	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	63	%
	$ 5,269	$ 5,269			
Donghai County Dongfang High Purity Electronic Materials Co., Ltd.	$ 1,525	$ 1,473	Equity	46	%
Xilingol Tongli Germanium Co. Ltd.	3,017	3,190	Equity	25	%
Emeishan Jia Mei High Purity Metals Co., Ltd.	911	915	Equity	25	%
	$ 5,453	$ 5,578			

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 63%. On November 2, 2017, BoYu raised additional capital in the amount of $2 million in cash from a third-party investor through the issuance of shares equivalent to 10% ownership of BoYu. As a result, our ownership of BoYu was diluted from 70% to 63%. We continue to consolidate BoYu as we have a controlling financial interest and have majority control of the board and accordingly no gain was recognized as a result of this equity transaction. 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 March 31, 2018 and 2017, the three consolidated joint ventures, before eliminating inter-company transactions, generated an income of $1.4 million and a loss of $12,000, respectively, of

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which a gain of $315,000 and a loss of $240,000, respectively, were allocated to noncontrolling interests, resulting in an income of $1.1 million and $228,000 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 $5.5 million and $5.6 million as of March 31, 2018 and December 31, 2017, respectively. We own 46% of the ownership interests in one of these companies and 25% in each of the other two companies. These three companies are not considered variable interest entities because:

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

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 March 31, 2018 and December 31, 2017, our consolidated joint ventures included these minority investments in "Other assets" in our condensed consolidated balance sheets with a carrying value of $4.3 million and $4.3 million, respectively.

There were no impairment charges in the three months ended March 31, 2018. The three months ended March 31, 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 months ended March 31, 2018 and 2017.

	Three Months Ended March 31,	
	2018	2017
Net revenue	$ 7,356	$ 5,455
Gross profit	$ 35	$ 3,722
Operating loss	$ (1,163)	$ (837)
Net loss	$ (1,430)	$ (1,705)

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 $334,000 and $933,000 for the three months ended March 31, 2018 and 2017, respectively.

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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, 2017	$ 3,532	$ 39	$ 231,679	$ (54,837)	$ 3,407	$ 183,820	$ 4,497	$ 188,317
Common stock options exercised	—	—	66	—	—	66	—	66
Stock-based compensation	—	—	467	—	—	467	—	467
Net income	—	—	—	2,875	—	2,875	315	3,190
Other comprehensive income	—	—	—	—	2,439	2,439	260	2,699
Balance as of March 31, 2018	$ 3,532	$ 39	$ 232,212	$ (51,962)	$ 5,846	$ 189,667	$ 5,072	$ 194,739

There were no reclassification adjustments from accumulated other comprehensive income for the three months ended March 31, 2018 and 2017.

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 and 2017. During the three months ended March 31, 2018, we did not repurchase any shares under the approved stock repurchase program. As of March 31, 2018, approximately $2.7 million remained available for future repurchases under this program. Currently, we do not plan to repurchase additional shares.

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 March 31,	
	2018	2017
Cost of revenue	$ 21	$ 8
Selling, general and administrative	369	256
Research and development	77	48
Total stock-based compensation	467	312
Tax effect on stock-based compensation	—	—
Net effect on net income	$ 467	$ 312

As of March 31, 2018, the unamortized compensation costs related to unvested stock options granted to employees under our stock option plan was approximately $1.5 million, net of estimated forfeitures of $175,000. These costs will be amortized on a straight-line basis over a weighted-average period of approximately 2.2 years and will be

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adjusted for subsequent changes in estimated forfeitures. We did not capitalize any stock-based compensation to inventory as of March 31, 2018 and December 31, 2017 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 March 31, 2018. There were 60,000 options with a weighted-average grant date fair values of $2.76 per share granted in the three months ended March 31, 2017. The fair values of our stock options granted to employees for the three months ended March 31, 2018 and 2017 were estimated using the following weighted-average assumptions:

	Three Months Ended March 31, 2018		Three Months Ended March 31, 2017	
Expected term (in years)	—		5.9	
Volatility	—	%	46.71	%
Expected dividend	—	%	—	%
Risk-free interest rate	—	%	2.08	%

The following table summarizes the stock option transactions during the three months ended March 31, 2018 (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, 2018	2,666	$ 3.81	6.87	$ 13,149
Granted	—	—		
Exercised	(22)	2.94		$ 97
Canceled and expired	—	—		
Balance as of March 31, 2018	2,644	$ 3.81	6.66	$ 9,409
Options vested as of March 31, 2018 and unvested options expected to vest, net of forfeitures	2,616	$ 3.79	6.64	$ 9,352
Options exercisable as of March 31, 2018	1,694	$ 3.41	5.81	$ 6,523

The aggregate intrinsic value in the table above represents the total pretax intrinsic value, based on our closing price of $7.25 on March 29, 2018, 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 three months ended March 31, 2018 is presented below (in thousands, except per share data):

Stock Awards	Shares	Weighted-Average Grant Date Fair Value
Non-vested as of January 1, 2018	480	$ 7.13
Granted	4	$ 7.35
Vested	—	$ —
Forfeited	—	$ —
Non-vested as of March 31, 2018	484	$ 7.13

As of March 31, 2018, the unamortized compensation costs related to unvested restricted stock awards was approximately $2.9 million, which is to be amortized on a straight-line basis over a weighted-average period of approximately 1.7 years.

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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 March 31,	
	2018	2017
Numerator:		
Net income attributable to AXT, Inc.	$ 2,875	$ 665
Less: Preferred stock dividends	(44)	(44)
Net income available to common stockholders	$ 2,831	$ 621
Denominator:		
Denominator for basic net income per share - weighted-average common shares	38,941	34,210
Effect of dilutive securities:		
Common stock options	1,289	1,220
Restricted stock awards	134	194
Denominator for dilutive net income per common shares	40,364	35,624
Net income attributable to AXT, Inc. per common share:		
Basic	$ 0.07	$ 0.02
Diluted	$ 0.07	$ 0.02
Options excluded from diluted net income per share as the impact is anti-dilutive	184	639
Restricted stock excluded from diluted net income per share as the impact is anti-dilutive	240	—

The 883,000 shares of $0.001 par value Series A preferred stock issued and outstanding as of March 31, 2018 and December 31, 2017, 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.

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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 March 31,	
	2018	2017
Product Type:		
Substrates	$ 19,364	$ 16,609
Raw Materials and Others	5,055	4,007
Total	$ 24,419	$ 20,616

Geographical Information

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

	Three Months Ended March 31,	
	2018	2017
Geographical region:		

China	$ 7,183	$ 4,422
Europe (primarily Germany)	6,393	5,598
Taiwan	5,049	3,318
Japan	2,455	3,140
North America (primarily the United States)	1,845	2,067
Asia Pacific (excluding China, Taiwan and Japan)	1,494	2,071
Total	$ 24,419	$ 20,616

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 March 31, 2018	December 31, 2017
Long-lived assets by geographic region, net of depreciation:		
North America	$ 1,237	$ 1,410
China	57,526	45,120
	$ 58,763	$ 46,530

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Significant Customers

Two customers, Landmark and Osram Opto, each represented 12% of our revenue for the three months ended March 31, 2018 while one customer, Osram Opto, represented 11% of our revenue for the three months ended March 31, 2017. Our top five customers, although not the same five customers for each period, represented 38% and 35% of our revenue for the three months ended March 31, 2018 and 2017, 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 13% of our accounts receivable balance as of March 31, 2018, and the same customer accounted for 12% of our accounts receivable balance as of December 31, 2017.

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 months ended March 31, 2018 and 2017 (in thousands):

	Three Months Ended March 31,	
	2018	2017
Beginning accrued product warranty	$ 133	$ 251
Accruals for warranties issued	59	33
Adjustments related to pre-existing warranties including expirations and changes in estimates	(46)	(105)
Cost of warranty repair	(29)	(46)
Ending accrued product warranty	$ 117	$ 133

Contractual Obligations

We lease certain office space, warehouse facilities and equipment under long-term operating leases expiring at various dates through April 2023. The majority of our lease obligations relate to our lease agreement for the facility in Fremont, California with approximately 19,467 square feet. The term of the original lease for this facility would have expired in 2017. According to the lease agreement, we had an option to extend the term of the lease for an additional three years. In May 2017, we exercised this option and the lease was extended for an additional three year term. All terms of this lease otherwise remain the same and the term of 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

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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 March 31, 2018 (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	$ 550	$ 226	$ 299	$ 25	$ —
Royalty agreement	431	431	—	—	—
Total	$ 981	$ 657	$ 299	$ 25	$ —

Land Purchase and Investment Agreement

We are in the process of relocating our gallium arsenide production line to Dingxing, China. In addition to a land rights and building purchase agreement that we entered into with a private real estate development company to acquire our new manufacturing facility, we also entered into a cooperation agreement with the Dingxing local government. In addition to pledging its full support and cooperation, the Dingxing local government will issue certain credits or rebates to us as we achieve certain milestones. We, in turn, agreed to hire local workers over time, pay taxes when due and eventually demonstrate a total investment of approximately $90 million in value, assets and capital. The investment will include cash paid for the land and buildings, cash on deposit in our name at local banks, the gross value of new and used equipment (including future equipment that might be used for indium phosphide and germanium substrates production), the deemed value for our customer list or the end user of our substrates (for example, the end users of 3-D sensing VCSELs (vertical cavity surface emitting lasers)), a deemed value for employment of local citizens, a deemed value for our proprietary process technology, other intellectual property, other intangibles and additional items of value. There is no timeline or deadline by which this must be accomplished, rather it is a good faith covenant entered into between AXT and the Dingxing local government. Further, there is no specific penalty contemplated if either party breaches the agreement. However, the agreement does state that each party has a right to seek from the other party compensation for losses. Under certain conditions, the Dingxing local government may purchase the land and building at the appraised value. We believe that such cooperation agreements are normal, customary and usual in China and that the future valuation is flexible. We have a similar agreement with the city of Kazuo, China, although on a smaller scale. The total investment targeted by AXT in Kazuo is approximately $15 million in value, assets and capital.

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 March 31, 2018, 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 $224,000 and a gain of $15,000 for the three months ended March 31, 2018 and 2017, respectively. These amounts are included in “Other (expense) income, net” on our condensed consolidated statements of operations.

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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. Our deferred tax assets have been reduced to zero by a valuation allowance.

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.

We recognize interest and penalties related to uncertain tax positions in income tax expense. Income tax expense for the three months ended March 31, 2018 includes no interest and penalties. As of March 31, 2018, we have no accrued interest and penalties related to uncertain tax positions. We file income tax returns in the U.S. federal, various states and foreign jurisdictions. We have substantially concluded all U.S. federal and state income tax matters through 2002 and 2013, respectively.

Provision for income taxes for the three months ended March 31, 2018 was mostly related to our wholly owned China subsidiaries 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 months ended March 31, 2018 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. Revenue

Revenue Recognition

We manufacture and sell high-performance compound semiconductor substrates including indium phosphide, 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 purchase orders placed by our customers, and our terms and conditions of sale do not require customer acceptance. We account for a contract with a customer when there is a legally enforceable contract, which could be the customer's purchase order, the rights of the parties are

identified, the contract has commercial terms, and collectibility of the contract consideration is probable. The majority of our contracts have a single performance obligation to transfer products and are short term in nature, usually less than one year. Our revenue is measured based on the consideration specified in the contract with each customer in exchange for transferring products that is generally based upon a negotiated, formula, list or fixed price. Revenue is recognized when control of the promised goods is transferred to our customer, which is either upon shipment from our dock, receipt at the customer's dock, or removal from consignment inventory at the customer's location, in an amount that reflects the consideration we expect to be entitled to receive in exchange for those goods.

We have elected to account for shipping and handling as activities to fulfill the promise to transfer the goods. As such, shipping and handling fees billed to customers in a sales transaction are recorded in revenue and shipping and handling costs incurred are recorded in cost of revenue. Sales taxes and value added taxes in foreign jurisdictions that are collected from customers and remitted to governmental authorities are accounted for on a net basis and, therefore, are excluded from net sales.

We do not provide training, installation or commissioning services. We provide for future returns based on historical data, prior experience, current economic trends and changes in customer demand at the time revenue is recognized. We do not recognize any asset associated with the incremental cost of obtaining revenue generating

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customer contracts. As such, sales commissions are expensed as incurred, given that the expected period of benefit is less than one year.

On January 1, 2018, we adopted ASC Topic 606, Revenue from Contracts with Customers ("ASC 606"), and its related amendments, using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. The adoption of ASC 606, using the modified retrospective approach, had no significant impact to our accumulated deficit as of January 1, 2018 and no significant impact to the total net cash from or used in operating, investing, or financing activities within the condensed consolidated statements of cash flows.

Contract Balances

We receive payments from customers based on a billing schedule as established in our contracts. Contract assets are recorded when we have a conditional right to consideration for our completed performance under the contracts. Accounts receivables are recorded when the right to this consideration becomes unconditional. We do not have material contract assets as of March 31, 2018.

Contract liabilities primarily relate to advances or deposits received from our customers before revenue is recognized under the contract. Contract liabilities are recognized as revenue as, or when, we perform under the contract. These amounts are recorded in "Accrued liabilities" on the condensed consolidated balance sheets.

	March 31, 2018	December 31, 2017
Contract liabilities	$ (1,061)	$ (924)
Revenue recognized in the three months period ended from:		
Amounts included in contract liabilities at the beginning of the period	$ 643	$ 563

Disaggregated Revenue

In general, revenue disaggregated by product types and geography (See Note 11) is aligned according to the nature and economic characteristics of our business and provides meaningful disaggregation of our results of operations. Since we operate in one segment, all financial segment and product line information can be found in the condensed consolidated financial statements.

Practical Expedients and Exemptions

As part of our adoption of ASC 606, we elected to use the following practical expedients: (i) not to adjust the promised amount of consideration for the effects of a significant financing component when we expect, at contract inception, that the period between our transfer of a promised product or service to a customer and when the customer pays for that product or service will be one year or less; (ii) to expense costs as incurred for costs to obtain a contract when the amortization period would have been one year or less; (iii) not to assess whether promised goods or services are performance obligations if they are immaterial in the context of the contract with the customer.

In addition, we do not disclose the value of unsatisfied performance obligations for contracts with an original expected length of one year or less.

Note 16. Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued new guidance related to revenue recognition, which outlines a comprehensive revenue recognition model and supersedes most current revenue recognition guidance. The new guidance requires a company to recognize revenue as control of goods or services transfers to a customer at an amount that reflects the expected consideration to be received in exchange for those goods or services. In August 2015, the FASB issued an amendment to defer the effective date of the guidance. The guidance became effective in the first quarter of our fiscal year 2018. The new standard creates a single source of revenue guidance under accounting principles generally accepted in the United States, eliminating industry-specific guidance.

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The underlying principle of the standard is to recognize revenue when a customer obtains control of promised goods or services at an amount that reflects the consideration that is expected to be received in exchange for those goods or services. An entity should apply a five-step approach for recognizing revenue as follows (1) identify the contract with a customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when, or as, the entity satisfies a performance obligation. The standard also requires increased disclosures including the nature, amount, timing, and uncertainty of revenues and cash flows related to contracts with customers. The standard allows two methods of adoption: (1) retrospectively to each prior period presented (“full retrospective method”), or (2) retrospectively with the cumulative effect recognized in retained earnings as of the date of adoption ("modified retrospective method").

With regard to Accounting Standards Update (“ASU”) 2014-09 Revenue from Contracts with Customers, we established a crossfunctional team to assess the potential impact of the new standard and reviewed current accounting policies and practices to identify potential differences that would result from applying the requirements of the new standard to revenue contracts and identifying appropriate changes to the business processes, systems and controls to support revenue recognition and disclosure requirements under the new standard. We completed our evaluation of the potential impact on business processes, systems, controls and condensed consolidated financial statements of the new revenue standard and have concluded there are no significant changes to our condensed consolidated statement of operations. We adopted this standard on January 1, 2018 using the modified retrospective method. (See Note 15)

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 became effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. We adopted this guidance effective January 1, 2018 and it did not have a significant impact 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 this standard in fiscal 2019 and are currently evaluating the impact of the guidance on our condensed consolidated financial statements.

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 adopted this guidance effective January 1, 2018 and it did not have a significant impact 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 adopted this guidance effective January 1, 2018 and it did not have a significant impact 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

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application permitted. We adopted this guidance effective January 1, 2018 and it did not have a significant impact 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 adopted this guidance effective January 1, 2018 and it did not have a significant impact on our condensed consolidated financial statements.

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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 27A of the Securities Act of 1933, as amended, and 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, the life cycles of our products and applications, gross margins, expense levels, the impact of the adoption of certain accounting pronouncements, our investments in capital projects, our ability to relocate our gallium arsenide production line in a timely and orderly manner, our estimated construction and relocation costs with respect to the relocation of our gallium arsenide production line, our ability to have customers re-qualify substrates from our new manufacturing location in Dingxing, 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 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, 2017 and the condensed consolidated financial statements included elsewhere in this report.

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Overview

AXT, Inc. (“AXT”, “the company”, “we,” “us,” and “our” refer to AXT, Inc. and its consolidated subsidiaries) is a worldwide materials science company that develops and produces 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 performance requirements of a semiconductor or optoelectronic device. 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 do not design or manufacture the chips. We add value by researching, developing and producing the specialty material wafers. 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).

Semi-insulating GaAs is used to create various high speed microwave components, including power amplifier chips used in cell phones, satellite communications and broadcast television applications. Semi-conducting GaAs substrates are used to create opto-electronic products, including high brightness light emitting diodes (HBLEDs) that are often used to backlight wireless handsets and liquid crystal display (LCD) TVs and also used for automotive panels, signage, display and lighting applications. A possible new application for semi-conducting GaAs is 3-D sensing chips using VCSELs (vertical cavity surface emitting lasers) as an array of lasers on a single chip that could be used in cell phones and other devices. InP is a high performance semiconductor substrate used in broadband and fiber optic applications and data center connectivity. In recent years, InP demand has increased. Ge substrates are used in applications such as solar cells for space and terrestrial photovoltaic applications.

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 80%, 81% and 75% of our revenue and our raw materials product group generated 20%, 19% and 25% for 2017, 2016 and 2015, respectively.

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

Products		
Substrate Group	Wafer 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 Integrated circuits (PICs) • High efficiency terrestrial solar cells (CPV) • RF amplifier and switching (military wireless and potential 5G) • Infrared light-emitting diode (LEDs) 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 and automobiles
Gallium Arsenide (GaAs - semi-conducting)	1”, 2”, 3”, 4”, 5", 6”	• 3-D sensing using VCSELs • Data center communication using VCSELs • High brightness LEDs • Lasers • Near-infrared sensors • Printer head lasers and LEDs • Laser machining, cutting and drilling • Optical couplers • High efficiency solar cells for drones and automobiles • Night vision goggles
Germanium (Ge)	2”, 4”, 6”	• Satellite solar cells • Optical sensors and detectors • Terrestrial concentrated photo voltaic (CPV) cells • 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 (B2O3)		

	• 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
pBN insulating parts	• Metal-Organic Chemical Vapour Deposition (MOCVD) reactors and organic light-emitting diode (OLED) rings

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We manufacture all of our products in the People's Republic of China (PRC or China), which generally has favorable costs for facilities and labor compared with comparable facilities in the United States, Europe or Japan. Our supply chain includes partial ownership of 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 companies 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 such companies. 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 such companies. We purchase portions of the materials produced by these companies for our own use and they sell the remainder of their production to third parties.

The Beijing city government is expanding its offices into the area where our manufacturing facility is currently located and is in the process of moving thousands of government employees into this area. The Beijing city government desires to upgrade this area and has applied pressure on manufacturing companies to relocate, including us. We are cooperating with the government and, in accordance with our relocation plan, are relocating our gallium arsenide production line. On September 12, 2017, we announced that we completed the purchase of a new manufacturing site in the city of Dingxing, China. Dingxing, located in the province of Hebei and under the jurisdiction of the prefecture-level city of Baoding, is approximately a 90 minute drive south of our current Beijing location. The Dingxing site is approximately 18.75 acres and currently has three existing buildings, which comprise approximately 140,000 sq. feet of production space and 50,000 sq. feet designated for offices and dormitories. We are developing plans to construct a fourth building at this site. We have also acquired property in the city of Kazuo, China, located in the province of Liaoning near the Inner Mongolia Autonomous Region and under the jurisdiction of the prefecture-level city of Chaoyang. Initially, the Kazuo site will be used to perform the first step in producing gallium arsenide, which is the blending or synthesis of gallium and arsenic ("poly synthesis"). We also intend to use the Kazuo site for ingot growth. The Dingxing site will focus on wafer processing and the ingots will be shipped from our Kazuo site to our Dingxing site. Although our current focus is on relocating our gallium arsenide production line, we are also relocating our germanium production line and will consider moving our indium phosphide production line in the future. Additional environmental permits, regulatory approvals and zoning conformance applications are in process.

To mitigate our risks and maintain our production schedule, we are moving our gallium arsenide equipment in stages so that we will continue to produce our gallium arsenide products at our Beijing site and then subsequently transfer increasing volume to the new sites. This approach will also minimize any disruption to our customers. We intend to complete this relocation by the end of 2018 or the first half of 2019. The relocation of our gallium arsenide production line requires us to accurately execute our relocation plan. We expect that our major customers will want to examine and qualify the wafer substrates produced from the new manufacturing line before placing volume purchase orders for such products. We have made available to certain customers initial gallium arsenide qualification wafers produced from the new manufacturing line. 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.

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 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.

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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, 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 purchase orders placed by our customers, and our terms and conditions of sale do not require customer acceptance. We account for a contract with a customer when there is a legally enforceable contract, which could be the customer's purchase order, the rights of the parties are identified, the contract has commercial terms, and collectibility of the contract consideration is probable. The majority of our contracts have a single performance obligation to transfer products and are short term in nature, usually less than one year.

Our revenue is measured based on the consideration specified in the contract with each customer in exchange for transferring products that is generally based upon a negotiated, formula, list or fixed price. Revenue is recognized when control of the promised goods is transferred to our customer, which is either upon shipment from our dock, receipt at the customer's dock, or removal from consignment inventory at the customer's location, in an amount that reflects the consideration we expect to be entitled to receive in exchange for those goods.

Accounts Receivable and Allowance for Doubtful Accounts

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

States. We assess the probability of collection based on a number of factors, including the length of time a receivable balance has been outstanding, our past history with the customer and their credit-worthiness.

We exercise judgment when determining the adequacy of our reserves as we evaluate historical bad debt trends, general economic conditions in the United States and internationally, and changes in customer financial conditions. Uncollectible receivables are recorded as bad debt expense when all efforts to collect have been exhausted and recoveries are recognized when they are received. As of March 31, 2018 and December 31, 2017, our accounts receivable, net balance was $21.3 million and $22.8 million, respectively, which was net of an allowance for doubtful accounts of $358,000 and $358,000, 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 March 31, 2018 and December 31, 2017, our allowance for sales returns was $157,000 and $169,000, respectively.

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Product Warranty

We maintain a product warranty 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 March 31, 2018 and December 31, 2017, accrued product warranties totaled $117,000 and $133,000, 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 March 31, 2018 and December 31, 2017, we had an inventory reserve of $13.7 million and $13.3 million, respectively, for excess and obsolete inventory and $322,000 and $291,000, 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 Accounting Standards Codification (“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 unconsolidated 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 March 31, 2018. The three months ended March 31, 2017 include an impairment charge of $313,000 for one of the gallium companies. 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.

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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.

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 March 31, 2018 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 months ended March 31, 2018 and 2017.

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 March 31, 2018 and December 31, 2017.

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Stock-based Compensation

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

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

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. Our deferred tax assets have been reduced to zero by valuation allowance.

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 consolidated financial statements for additional information.

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Results of Operations

Revenue

	March 31, 2018	2017	Increase (Decrease)	% Change	
Product Type:	($ in thousands)				
Substrates	$ 19,364	$ 16,609	$ 2,755	16.6	%
Raw Materials and Others	5,055	4,007	1,048	26.2	%
Total revenue	$ 24,419	$ 20,616	$ 3,803	18.4	%

Revenue increased $3.8 million, or 18.4%, to $24.4 million for the three months ended March 31, 2018 from $20.6 million for the three months ended March 31, 2017. The revenue increase for the three months ended March 31, 2018 as compared to the same period in 2017 was primarily the result of a higher demand for our InP and Ge substrates, each of these wafer substrate products had over a 25% increase in sales in 2018 as compared to the same period in 2017, and stronger raw material sales performance from our consolidated subsidiaries. In general, the increase in our raw material sales and substrate sales resulted from a higher number of overall units sold while average selling prices remained either flat or, in some cases, were down slightly. Our InP substrates revenue increased in the three months ended March 31, 2018 as compared to the same period in 2017 primarily due to increased demand for the passive optical network (PON) market while our Ge substrate revenue increased primarily due to more planned satellite launches in 2018.

Revenue by Geographic Region

	March 31, 2018		2017		2017 to 2018 Increase (Decrease)	% Change	
	($ in thousands)						
China	$ 7,183		$ 4,422		$ 2,761	62.4	%
% of total revenue	29	%	22	%			
Europe (primarily Germany)	6,393		5,598		795	14.2	%
% of total revenue	26	%	27	%			
Taiwan	5,049		3,318		1,731	52.2	%
% of total revenue	21	%	16	%			
Japan	2,455		3,140		(685)	(21.8)	%
% of total revenue	10	%	15	%			
North America (primarily the United States)	1,845		2,067		(222)	(10.7)	%

% of total revenue	8	%	10	%		
Asia Pacific (excluding China, Taiwan and Japan)	1,494		2,071		(577)	(27.9)	%
% of total revenue	6	%	10	%		
Total revenue	$ 24,419		$ 20,616		$ 3,803	18.4	%

Revenue from customers in China increased by 62.4% in the three months ended March 31, 2018, primarily due to an increase of $0.8 million, or 42%, from raw materials sales and an increase of $1.9 million, or 78%, from wafer substrate sales. Sales of each of our three wafer substrate products in China grew by over 60% in the three months ended March 31, 2018 as compared to the same period in 2017. The growth of Ge substrate sales that we experienced in 2016 and 2017 continued into 2018 as the satellite solar cell market remained strong in the three months ended March 31, 2018. Revenue from customers in Taiwan increased by 52.2%, primarily due to strong demand for GaAs substrates used in wireless and LED applications and InP substrates used in silicon photonics, specifically in the PON market. Revenue from Japan and the other Asian Pacific countries, in aggregate, decreased by $1.3 million due to a decrease in our wafer substrate sales, which was partially offset by a stronger raw material sales performance of our consolidated subsidiaries.

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Gross Margin

	Three Months Ended March 31,		Increase	
	2018	2017	(Decrease)	% Change
	($ in thousands)			
Gross profit	$ 9,573	$ 6,288	$ 3,285	52.2 %
Gross Margin %	39.2 %	30.5 %		

Gross profit increased $3.3 million, or 52.2%, to $9.6 million for the three months ended March 31, 2018 from $6.3 million for the three months ended March 31, 2017. Gross margin increased primarily due to favorable product mix, higher production volume and overall improvements in yield and manufacturing efficiencies for the three months ended March 31, 2018 as compared to the same period in 2017.

Selling, General and Administrative Expenses

	Three Months Ended March 31,		Increase	
	2018	2017	(Decrease)	% Change
	($ in thousands)			
Selling, general and administrative expenses	$ 4,222	$ 3,793	$ 429	11.3 %
% of total revenue	17.3 %	18.4 %		

Selling, general and administrative expenses increased $0.4 million, or 11.3%, to $4.2 million for the three months ended March 31, 2018 from $3.8 million for the three months ended March 31, 2017. The higher selling, general and administrative expenses were primarily from higher professional service fees, facility maintenance fees and personnel-related costs which were partially offset by the absence of expenses incurred as a result of the business interruption caused by an electrical fire in our Beijing facility on the evening of March 15, 2017.

Research and Development

	Three Months Ended March 31,		Increase	
	2018	2017	(Decrease)	% Change

	($ in thousands)			
Research and development	$ 1,420	$ 1,124	$ 296	26.3 %
% of total revenue	5.8 %	5.5 %		

Research and development expenses increased $0.3 million, or 26.3% to $1.4 million for the three months ended March 31, 2018 from $1.1 million for the three months ended March 31, 2017. The increase in research and development expenses for the three months ended March 31, 2018 was primarily due to the higher personnel-related costs and increase use of raw materials for product development programs.

Interest Income, Net

	Three Months Ended March 31,		Increase (Decrease)	% Change
	2018	2017		
	($ in thousands)			
Interest income, net	$ 142	$ 98	$ 44	44.9 %
% of total revenue	0.6 %	0.5 %		

Interest income, net increased for the three months ended March 31, 2018 as compared to the same period in 2017 primarily due to higher returns from our mix of investment securities held due to the increased cash balance as a result of the public offering in March 2017 and higher market interest rates.

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Equity in Loss of Unconsolidated Joint Ventures

	Three Months Ended March 31,		Increase	
	2018	2017	(Decrease)	% Change
	($ in thousands)			
Equity in loss of unconsolidated joint ventures	$ (334)	$ (933)	$ (599)	(64.2) %
% of total revenue	(1.4) %	(4.5) %		

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 $599,000 to a loss of $334,000 for the three months ended March 31, 2018 from a loss of $933,000 for the three months ended March 31, 2017 as a result of the absence of a $313,000 impairment charge for one of the gallium companies in the three months ended March 31, 2017 and better performance of our unconsolidated joint ventures in the three months ended in March 31, 2018 as compared to the same period of 2017. There were no impairment charges in the three months ended March 31, 2018.

Other (Expense) Income, Net

	Three Months Ended March 31,		Increase	
	2018	2017	(Decrease)	% Change
	($ in thousands)			
Other (expense) income, net	$ (215)	$ 48	$ (263)	(547.9) %
% of total revenue	(0.9) %	0.2 %		

Other (expense) income, net decreased $263,000 to a loss of $215,000 for the three months ended March 31, 2018 from income of $48,000 for the three months ended March 31, 2017. Other (expense) income, net decreased primarily due to an absence of the realized gain recognized from sales of GHI stock in the three ended March 31, 2018. During the three months ended March 31, 2017, we sold the remainder of our GHI stock. As of March 31, 2018, we no longer hold any GHI stock.

Provision for Income Taxes

	Three Months Ended March 31,		Increase (Decrease)	% Change
	2018	2017		
	($ in thousands)			
Provision for income taxes	$ 334	$ 159	$ 175	110.1 %
% of total revenue	1.4 %	0.8 %		

Provision for income taxes for the three months ended March 31, 2018 was $334,000, which was mostly related to our China subsidiaries and our three consolidated joint venture companies in China. No income taxes or benefits have been provided for our U.S. operations as the income in the U.S. had been fully offset by utilization of federal and state net operating loss carryforwards. Additionally, there is uncertainty of generating future profit in the U.S. which has 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.

Due to our uncertainty regarding our future profitability in the U.S., we recorded a full valuation allowance against our net deferred tax assets of $22 million in 2017, $68 million in 2016 and $66 million in 2015.

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Net Loss Attributable to Noncontrolling Interests

	Three Months Ended March 31,		(Increase)	
	2018	2017	Decrease	% Change
	($ in thousands)			
Net (income) loss attributable to noncontrolling interests	$ (315)	$ 240	$ (555)	(231.3) %
% of total revenue	(1.3) %	1.2 %		

The increase in noncontrolling interests' share of income for the three months ended March 31, 2018 as compared to the same period in 2017 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 March 31, 2018, our principal source of liquidity was $66.9 million, which consisted of cash and cash equivalents of $39.2 million, short-term investments of $15.2 million and long-term investments of $12.5 million. In the three months ended March 31, 2018, cash and cash equivalents decreased by $5.2 million and short-term and long-term investments decreased by $4.9 million. The decrease in cash and cash equivalents of $5.2 million in the three months ended March 31, 2018 was primarily due to net cash used in investing activities of $7.1 million, partially offset by net cash provided by operating activities of $1.6 million and net cash provided by financing activities of $66,000. As of March 31, 2018, we and our consolidated joint ventures held approximately $16.7 million in cash and investments in foreign bank accounts. This consists of $9.6 million held by our wholly owned subsidiaries in China and $7.1 million held by our three partially-owned consolidated subsidiaries in China.

As of March 31, 2017, our principal source of liquidity was $86.8 million, which consisted of cash and cash equivalents of $56.5 million, short-term investments of $20.5 million and long-term investments of $9.8 million. In the three months ended March 31, 2017, cash and cash equivalents increased by $20.4 million and short-term and long-term investments increased by $12.7 million. The increase in cash and cash equivalents of $20.4 million in the three months ended March 31, 2017 was primarily due to net cash provided by operating activities of $1.1 million and net cash provided by financing activities of $32.2 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, which were partially offset by net cash used in investing activities of $13.0 million. As of March 31, 2017, we and our consolidated joint ventures held

approximately $14.1 million in cash and investments in foreign bank accounts. This consists of $7.5 million held by our wholly owned subsidiary in China and $6.6 million held by our three partially-owned consolidated subsidiaries in China.

Net cash provided by operating activities of $1.6 million for the three months ended March 31, 2018 was primarily comprised of a net income of $3.2 million, adjusted for non-cash items of depreciation and amortization of $1.1 million, loss on equity method investments of $0.3 million, stock-based compensation of $0.5 million, which were partially offset by a net change of $3.5 million in operating assets and liabilities.

Net cash provided by operating activities of $1.1 million for the three months ended March 31, 2017 was primarily comprised of a net income of $0.4 million, adjusted for non-cash items of depreciation and amortization of $1.1 million, loss on equity method investments of $0.6 million, impairment charge on equity investee of $0.3 million and stock-based compensation of $0.3 million, which were partially offset by a net change of $1.7 million in operating assets and liabilities.

Net cash used in investing activities of $7.1 million for the three months ended March 31, 2018 was primarily from the purchase of marketable investment securities totaling $9.9 million and the purchase of property, plant and

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equipment of $11.8 million, which were partially offset by proceeds from maturities and sales of available-for-sale securities of $14.7 million.

Net cash used in investing activities of $13.0 million for the three months ended March 31, 2017 was primarily from the purchase of marketable investment securities totaling $21.7 million and the purchase of property, plant and equipment of $0.3 million, which were partially offset by proceeds from maturities and sales of available-for-sale securities of $9.0 million.

Net cash provided by financing activities was $66,000 for the three months ended March 31, 2018, which consisted of net proceeds of $66,000 on the issuance of common stock pursuant to stock option exercises.

Net cash provided by financing activities was $32.2 million for the three months ended March 31, 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 $0.8 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.

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 three months ended March 31, 2018, we did not repurchase any shares under the approved stock repurchase program. As of March 31, 2018, approximately $2.7 million remained available for future repurchases under this program. Currently, we do not plan to repurchase additional shares.

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 are required to relocate our gallium arsenide production line. We are cooperating with the government and, in accordance with our relocation plan, are relocating our gallium arsenide production line as well as our germanium production line. We will consider relocating our indium phosphide production subsequently. On September 12, 2017, we announced that we completed the purchase of a new manufacturing site in the city of Dingxing, China. The Dingxing site is approximately 18.75 acres and currently has three existing buildings, which comprise approximately 140,000 sq. feet of production space and 50,000 sq. feet designated for offices and dormitories. We believe that 3D-sensing VCELs will require additional gallium arsenide capacity and we are developing plans to construct a fourth building at this site. In addition, we have acquired a second new site in city of Kazuo, located in the province in Liaoning near the Inner Mongolia Autonomous Region, which will initially be used for poly synthesis and ingot growth for gallium arsenide and germanium as well as possible expansion of indium phosphide ingot growth. We do not yet have comprehensive construction bids for further modifications to the existing buildings, the construction of new buildings or third party estimates for the complete relocation costs, but we believe these costs will be in the range of $40 million to $50 million, which includes the amount we have already paid for the purchase of our new manufacturing facilities and will extend into 2019. However, such costs could be higher than our current estimates.

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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 $768,000 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 are being used 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 “Risk 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 April 2023. 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 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 March 31, 2018 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	$ 550	$ 226	$ 299	$ 25	$ —
Royalty agreement	431	431	—	—	—
Total	$ 981	$ 657	$ 299	$ 25	$ —

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

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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.

Land Purchase and Investment Agreement

We are in the process of relocating our gallium arsenide production line to Dingxing, China. In addition to a land rights and building purchase agreement that we entered into with a private real estate development company to acquire our new manufacturing facility, we also entered into a cooperation agreement with the Dingxing local government. In addition to pledging its full support and cooperation, the Dingxing local government will issue certain credits or rebates to us as we achieve certain milestones. We, in turn, agreed to hire local workers over time, pay taxes when due and eventually demonstrate a total investment of approximately $90 million in value, assets and capital. The investment will include cash paid for the land and buildings, cash on deposit in our name at local banks, the gross value of new and used equipment (including future equipment that might be used for indium phosphide and germanium substrates production), the deemed value for our customer list or the end user of our substrates (for example, the end users of 3-D sensing VCSELs), a deemed value for employment of local citizens, a deemed value for our proprietary process technology, other intellectual property, other intangibles and additional items of value. There is no timeline or deadline by which this must be accomplished, rather it is a good faith covenant entered into between AXT and the Dingxing local government. Further, there is no specific penalty contemplated if either party breaches the agreement. However the agreement does state that each party has a right to seek from the other party compensation for losses. Under certain conditions, the Dingxing local government may purchase the land and building at the appraised value. We believe that such cooperation agreements are normal, customary and usual in China and that the future valuation is flexible. We have a similar agreement with the city of Kazuo, China, although on a smaller scale. The total investment targeted by AXT in Kazuo is approximately $15 million in value, assets and capital.

Off-Balance Sheet Arrangements

As of March 31, 2018, 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 16 - Recent Accounting Pronouncements” in the Notes to Condensed Consolidated Financial Statements of this Form 10-Q.

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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. Although during 2016 and 2015, we recorded a foreign exchange gain of $232,000 and $717,000, respectively, during 2017 we recorded a net foreign exchange loss of $602,000, included as part of other (expense) income, net in our consolidated statements of operation. 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 March 31, 2018 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.

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Interest Rate Risk

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

Instrument	Balance as of March 31, 2018	Current Interest Rate	Projected Annual Interest Income	Proforma 10% Interest Rate Decline Income	Proforma 10% Interest Rate Increase Income
Cash and cash equivalents	$ 39,189	0.14 %	$ 55	$ 50	$ 61
Investments in marketable debt	27,706	2.25 %	623	561	685
			$ 678	$ 611	$ 746

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 13% of our accounts receivable balance as of March 31, 2018, and the same customer accounted for 12% of our accounts receivable balance as of December 31, 2017.

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 March 31, 2018 and December 31, 2017, we did not maintain any direct investments under the cost method, our direct minority investments under the equity method totaled $5.5 million and $5.6 million, respectively, and our indirect minority investments by our consolidated joint ventures totaled $4.3 million and $4.3 million, respectively. In aggregate, as of March 31, 2018 and December 31, 2017, the total of our direct and indirect investments in the seven companies under the equity method totaled $9.7 million and $9.8 million, respectively.

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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 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 Securities 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 made in the three months ended March 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

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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 enable 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, wave lengths 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 phones 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 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 factors and other variables change from period to period and these fluctuations are expected to continue in the future.

Further, we do not control the prices at which our subsidiaries and other joint venture companies sell their raw material products to third parties and we do not control their production process. 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 three 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 this regard, in the first quarter

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of 2018 our consolidated raw gallium company incurred a $295,000 charge. In such events, our gross margin is 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, other natural disasters or calamities or government-ordered mandatory factory shutdowns. Severe air pollution in Beijing can trigger mandatory factory shutdowns. For example, in the first quarter of 2018, over 300 manufacturing companies, including AXT, were intermittently shut down by the local government for a total of ten days from February 27 to March 31, due to severe air pollution. 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. For example, in the three months ended December 31, 2015, our revenue dropped to $18.1 million and our gross margin was only 17.1%.

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 recorded a charge of approximately $907,000 in the first quarter of 2014. In the second quarter of 2016, we restructured the operations of Beijing JiYa Semiconductor Material Co., Ltd., one of our partially owned consolidated subsidiaries, which resulted in a reduction in force of 28 positions that were no longer required to support production and operations.

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 wafer 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.

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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 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, 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 is expanding its offices into the area where our manufacturing facility is currently located and is in the process of moving thousands of government employees into this area. The Beijing city government desires to upgrade this area and has applied pressure on manufacturing companies to relocate, including us. We are cooperating with the government and, in accordance with our relocation plan, are relocating our gallium arsenide production line to the city of Dingxing, which is approximately a 90 minute drive south of our current Beijing facility. In addition, we have acquired a second site in Kazuo, located in the province of Liaoning near the Inner Mongolia Autonomous Region and under the jurisdiction of the prefecture-level city of Chaoyang, which will initially be used for poly synthesis as well as ingot growth. Additional environmental permits, regulatory approvals and zoning conformance applications are in process for both sites. Given the fluidity and ever-increasing review of environmental and regulatory ordinances in China, there can be no assurance that these matters will be completed smoothly or at all.

The relocation of our gallium arsenide production line requires us to accurately execute our relocation plan. 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. For example, product qualification of our low EPD wafer substrates for 3-D sensing applications will be required by some customers 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 sites or commute under a program we will develop. 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 facilities. A loss of key employees and our inability to hire qualified employees could disrupt our production, which could materially and adversely impact our results of operations and our financial condition.

We do not yet have comprehensive construction bids for further modifications to the existing buildings, or the construction of new buildings or third party estimates for the complete relocation costs, but we believe these costs will be

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in the range of $40 million to $50 million, which include the amount we have already paid for the purchase of our new manufacturing facilities and will extend into 2019. However, such costs could be higher than our current estimates, particularly as we are now contemplating a larger facility that will enable us to rapidly add furnaces and other necessary production equipment to serve the anticipated demand for 3-D sensing VCSELs and other high-end applications.

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 shutdown 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 or required mandatory factory shutdowns. For example, in the first quarter of 2018, over 300 manufacturing companies, including AXT, were intermittently shut down by the local government for a total of ten days from February 27 to March 31 due to severe air pollution. If the government applies similar restrictions to us or requires mandatory factory shutdowns in the future, then such restrictions or shutdowns 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.

Customers may require that they re-qualify our gallium arsenide wafer substrates from the new manufacturing line.

We are required by the China central government to move our gallium arsenide production so that it is not within Beijing and are in the process of complying. Our larger customers will view this as a process engineering change and their internal quality control system will require them to re-qualify our product and ensure that the product characteristics still conform to their specifications. Delays in this qualification process or failures to re-qualify could result in a reduction of orders and have a material adverse effect on our revenue.

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, high furnace temperatures or, in the case of InP, high pressure during our manufacturing processes 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.

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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
- 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, when the average selling prices for the raw materials produced decline, this results in a negative impact on our revenue, gross margin and profitability. For example, the average selling prices for 4N gallium and for germanium were driven down by oversupply in 2015, 2016 and 2017, and negatively impacted our financial results. In 2017 and 2016, the seven companies accounted for under the equity method of accounting contributed a loss of $1.7 and $2.0 million, respectively, to our consolidated financial statements. There can be no assurance that the oversupply will be corrected by the market. Further, in several quarters over the past three 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 companies range 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 investment partners. Several of these 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 a partner in any of these ventures experiences problems with its operations, or deliberately withholds or

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disrupts services, 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 and shipments 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 venture companies or investment 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, the operations of that joint venture could be adversely affected and we could be subject to substantial liability for clean-up efforts, personal injury, fines or suspension or termination of our joint venture's operations. Employees working for our joint ventures or any of the other investment partners could bring litigation against us as a result of actions taken at the joint venture or investment partner facilities, even though we are not directly controlling those operations. 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 investment 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.

The China central government has become increasingly concerned about environmental hazards. Air pollution is a well-known problem in Beijing and other parts of China. In days of severe air pollution the government has ordered manufacturing companies to stop all production. The central government is tightening control over hazardous chemicals and other hazardous elements such as arsenic, which is produced by two of our joint venture companies. Similarly, a company's failure to meet the ever tightening standards for control of hazardous chemicals or hazardous elements could result in fines or shut downs. Any such orders directed at one of our joint venture companies could have a material adverse effect on our financial results.

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 Sumitomo, Japan Energy, Freiberger, Umicore, 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 process similar to our VGF process technology. Other competitors may develop and begin using similar technology. Sumitomo and Japan Energy also compete with us in the InP market. If we are unable to compete effectively, our revenue may not increase and we may not maintain profitability. We face many competitors that have a number of significant advantages over us, including:

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

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

The level and intensity of competition has increased over the past years and we expect competition to continue to increase in the future. Competitive pressures have resulted in reductions in the prices of our products, and continued

or increased competition could reduce our market share, require us to further reduce the prices of our products, affect our ability to recover costs and result in reduced gross margins and profitability.

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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. In certain years, we have 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, price reductions by competitors, 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 wafer 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 other manufacturing problems, customers may return product for credit, cancel or reduce orders or purchase products from our competitors. We may be unable to maintain or increase sales to our customers and sales of our products could decline. Defects in our products could cause us to incur higher manufacturing costs and suffer product returns and additional service expenses, all of which could adversely impact our operating results. If new products developed by us contain defects when released, our customers may be dissatisfied and we may suffer negative publicity or customer claims against us, lose sales or experience delays in market acceptance of our new products.

Our substrate products have a long qualification cycle that makes it difficult to forecast revenue from new customers or for new products sold to existing customers.

New customers typically place orders with us for our substrate products three months to a year or more after our initial contact with them. The sale of our products 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

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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. 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, 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 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. 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 for our products. 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.

A significant portion of our operating expense and manufacturing costs are relatively fixed. If revenue for a particular quarter is lower than we expect, we likely will be unable to proportionately reduce our operating expenses or fixed

manufacturing costs for that quarter, which would harm our operating results.

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If we do not successfully develop new product features and improvements and new products that respond to 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 product features, improved performance characteristics and new products, such as 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. 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 product features, improved performance characteristics and new products can be a highly complex process, and we may experience delays in developing and introducing them. 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 10 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 significant influence over every one 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 which would have a negative impact on our results of operations. 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. The significant decline in the selling prices of raw materials which began in 2015 and continued through 2017 has weaken some of these companies and their losses have negatively impacted our financial results.

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. 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. 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.

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

We might invest in additional joint venture companies 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 investment partners. New joint ventures could require cash investments or cause us to

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incur additional liabilities or other expenses, any of which could adversely affect our financial condition and operating results.

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

Some of our customers may be undercapitalized and cope with cash flow issues. Because of competitive market conditions, we may grant our customers extended payment terms when selling products to them. Subsequent to our fulfilling an order, 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. We have had some customers file for bankruptcy. If our customers do not pay amounts owed to us then we will 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, 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 would need to take a charge for a reduction in inventory values in accordance with the lower of cost or 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, would 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 or low or negative growth in China, Europe or 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;

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- increased volatility in foreign currency exchange rates;
- delays in, or curtailment of, purchasing decisions by our customers or potential customers;
- 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 tangible or intangible 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, including possible trade tariffs and restrictions, may have an impact on our business and financial condition in ways that we currently cannot predict.

Recent threats of trade tariffs and restrictions between China and the United States may, in our view, create an unstable environment. Currently, we have not identified any direct impact on our business, but there could be a negative impact on our operations and financial performance if tariffs are imposed on our products.

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 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.

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II Risks Related to International Aspects of Our Business

The Chinese central government is increasingly aware of air pollution and other forms of environmental pollution and their reform efforts can impact our manufacturing, including intermittent mandatory shutdowns.

The Chinese central government is demonstrating strong leadership to improve air quality and reduce environmental pollution. These efforts have impacted manufacturing companies through mandatory shutdowns, increased inspections and regulatory reforms. In the fourth quarter of 2017, many manufacturing companies in the greater Beijing area, including AXT, were instructed by the local government to cease most manufacturing for several days until the air quality improved. In the first quarter of 2018, from February 27 to March 31 over 300 manufacturing companies were again intermittently shut down by the local government for a total of ten days, or 30 percent of the remaining calendar days, due to severe air pollution. Our shipments were delayed and we were unable to achieve the revenue range in our guidance provided at our fourth quarter earnings announcement on February 21, 2018. We expect that mandatory factory shutdowns will occur in the future. If the frequency of such shutdowns increases, especially at the end of a quarter, or if the total number of days of shutdowns prevents us from producing enough wafers to ship, then these shutdowns will have a material adverse effect on our manufacturing output, revenue and factory utilization. We are currently relocating our gallium arsenide and germanium manufacturing and are adding capacity at our new sites. We believe these efforts will mitigate our exposure to mandatory factory shutdowns. However, until the majority of our relocation is completed and our new facilities are operational, we remain subject to potential mandatory factory shutdowns. Each of our ten raw material supply chain companies could also be impacted by environmental related orders from the central government.

Recent threats of trade tariffs could expand and impact our business.

Recent threats of trade tariffs and restrictions between China and the United States may, in our view, create an unstable environment. Currently, we have not identified any direct impact on our business, but there could be a negative impact on our operations and financial performance if tariffs are imposed on our products.

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

Typically over 85% 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. Therefore, our revenue growth depends significantly on the expansion of our international sales and operations.

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, threats of trade wars, 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; (vi) political instability in regions where we have operations and (vii) trade wars may also affect our business, financial condition and results of operations.

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

· changes in tariffs, import restrictions, export restrictions, or other trade barriers;

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- unexpected changes in regulatory requirements;
- longer periods to collect accounts receivable;
- foreign exchange rate fluctuations;
- changes in export license requirements;
- political and economic instability; and
- unexpected changes in diplomatic and trade relationships.

Most of 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. We also have some small sales denominated in Euro. Increases in the value of the U.S. dollar could increase the price of our products in non-U.S. markets and make our products more expensive than competitors' products in these markets.

We are subject to foreign exchange gains and losses that materially impact our income statement.

We are subject to foreign exchange gains and losses that materially impact our income statement. For example, in 2017 we incurred a loss of $602,000 and in the three months ended March 31, 2018 we incurred a loss of $224,000. In 2016 we incurred a gain of $232,000.

The functional currency of our wholly owned Chinese subsidiary and our partially owned joint venture companies is the Chinese renminbi, the local currency. We incur foreign exchange gains or losses when we pay dollars to one of our China-based companies or a third party supplier in China. Similarly, if a company in China pays renminbi into one of our bank accounts transacting in dollars the renminbi will be converted to dollars and we can incur a foreign exchange gain or loss. Hedging renminbi will be considered in the future but it is complicated by the number of companies involved, the diversity of transactions and restrictions imposed by the banking system in China.

Sales to Japanese customers are denominated in Japanese yen. This subjects us to fluctuations in the exchange rates between the U.S. dollar and the Japanese yen and can result in foreign exchange gains and losses. This has been problematic in the past and, therefore, we instituted a foreign currency hedging program dealing with yen which has mitigated the problem.

Joint venture companies in China bring certain risks.

Since our wholly owned subsidiary and 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:

- 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;
- difficulties in managing geographically disparate operations;
- difficulties in enforcing agreements through non-U.S. legal systems;

· political and economic instability, civil unrest or war;
· terrorist activities that impact international commerce;

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- 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.

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

We manufacture our substrates in China and, in 2017, approximately 91% of our sales were 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' current foreign policy 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.

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 manufacturing delays or 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.

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.

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

Our financial performance may be affected by changes in China's political, social, regulatory or economic environments. The role of the Chinese central and local governments in the Chinese economy is significant. Chinese policies toward hazardous materials, including arsenic, environmental controls, air pollution, economic liberalization, 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. We have observed a growing fluidity and tightening of regulations concerning hazardous materials, other environmental controls and air pollution. The Chinese government could revoke, terminate or suspend our operating licenses for reasons related to environmental control over the use of hazardous materials, air pollution, labor complaints, national security and similar reasons without compensation to us. In days of severe air pollution the government has ordered manufacturing companies to stop all production. For example, in the fourth quarter of 2017 many manufacturing companies in the greater Beijing area, including AXT, were instructed by the local government to cease most manufacturing for several days until the air quality improved. In the first quarter of 2018, from February 27 to March 31 over 300 manufacturing companies were again intermittently shut down by the local government for a total of ten days due to severe air pollution. Our shipments were delayed and we were unable to achieve the revenue range in our guidance provided at our fourth quarter earnings announcement on February 21, 2018. We expect that mandatory factory shutdowns will occur in the future. Any failure on our part to comply with governmental regulations could result in the loss of our ability to manufacture our products. Further, 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 Beijing city government is expanding its offices into the area where our manufacturing facility is currently located and is in the process of moving thousands of government employees into this area. The Beijing city government desires to upgrade this area and has applied pressure on manufacturing companies to relocate, including us. We are cooperating with the government and, in accordance with our relocation plan, are relocating our gallium arsenide wafer production line to the city of Dingxing, which is about 90 minutes south of our current facility. In addition, we have acquired a site in Kazuo, located in the province of Liaoning near the Inner Mongolia Autonomous Region and under the jurisdiction of the prefecture-level city of Chaoyang, which will initially be used for the synthesis of raw gallium and raw arsenic. We also intend to use the Kazuo site for ingot growth. Additional environmental permits, regulatory approvals and zoning conformance applications are in process for both sites. In light of the increased focus in China on the use of hazardous materials and environmental issues there can be no assurance that these matters will be completed smoothly or at all.

The relocation of our gallium arsenide production line requires us to accurately execute our relocation plan. 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.

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.

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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 finished goods 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 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, the relocation of our gallium arsenide manufacturing operations, the extent to which we pursue on-going capital expenditures, the acquisition and build out of the sites at Dingxing and Kazuo, 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;

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- disruptions in manufacturing if air pollution or another environmental hazard causes the government to order work stoppages.
- 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
- 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.

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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:

- $662/_3$% of the shares of voting stock not owned by the interested stockholder approve the merger or combination, or
- the board of directors approves the merger or combination or the transaction which resulted in the stockholder becoming an interested stockholder.

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

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

Any delisting from The Nasdaq Global Select Market could have an adverse effect on our business and on the trading of our common stock. If a delisting of our common stock were to occur, our common stock would trade 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, 2017, we had U.S. federal net operating loss carryforwards of approximately $63.6 million and state net operating loss carryforwards of approximately $0.3 million, which begin expiring in varying amounts from 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 might 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

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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 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, Environmental Regulations and Other Legal Matters

If we fail to comply with environmental and safety regulations, we may be subject to significant fines or forced to cease our operations.

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 materials 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

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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.

The Chinese central government is demonstrating strong leadership to improve air quality and reduce environmental pollution. These efforts have impacted manufacturing companies through mandatory shutdowns, increased inspections and regulatory reforms. In the fourth quarter of 2017, many manufacturing companies in the greater Beijing area, including AXT, were instructed by the local government to cease most manufacturing for several days until the air quality improved. In the first quarter of 2018, from February 27 to March 31 over 300 manufacturing companies were again intermittently shut down by the local government for a total of ten days, or 30 percent of the remaining calendar days, due to severe air pollution. Our shipments were delayed and we were unable to achieve the revenue range in our guidance provided at our fourth quarter earnings announcement on February 21, 2018. We expect that mandatory factory shutdowns will occur in the future. If the frequency of such shutdowns increases, especially at the end of a quarter, or if the total number of days of shutdowns prevents us from producing enough wafers to ship, then the shutdowns will have a material adverse effect on our manufacturing output, revenue and factory utilization. We are currently relocating our gallium arsenide and germanium manufacturing and are adding capacity at our new sites. We believe these efforts will mitigate our exposure to factory shutdowns. However, until the majority of our relocation is completed and our new facilities are operational, we remain subject to potential factory shutdowns. Each of our ten raw material supply chain companies could also be impacted by environmental related orders from the central government.

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 show good faith and, more recently, significant progress in relocating 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.

We could be subject to suits for personal injuries caused by hazardous materials.

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

Litigation is inherently uncertain and while we would expect to defend ourselves vigorously, it is possible that our business, financial condition, results of operations or cash flows could be affected in any particular period by litigation

pending and any additional litigation brought against us. In addition, future litigation could divert management's attention from our business and operations, causing our business and financial results to suffer. We could incur defense or settlement costs in excess of the insurance covering these litigation matters, or that could result in significant judgments against us or cause us to incur costly settlements, in excess of our insurance limits.

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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

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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.

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EXHIBIT INDEX

Exhibit Number	Description
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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.

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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: May 4, 2018 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)