

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

**FORM 10-K**

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**  
For the fiscal year ended **December 31, 2018**

**TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**  
Commission File Number **001-37824**

**IMPINJ, INC.**

(Exact name of Registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction of  
incorporation or organization)  
**400 Fairview Avenue North, Suite 1200,**  
**Seattle, Washington**  
(Address of principal executive offices)

**91-2041398**  
(I.R.S. Employer  
Identification No.)

**98109**  
(Zip Code)

**(206) 517-5300**

(Registrant's telephone number, including area code)

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

**Common Stock, \$0.001 par value per share**  
(Title of each class)

**The Nasdaq Global Select Market**  
(Name of each exchange on which registered)

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

None

Indicate by check mark whether the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes  No  Indicate by check mark whether the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes  No

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 every Interactive Data File required to be submitted 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 such files). Yes  No

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

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

Large accelerated filer   
Non-accelerated filer   
Emerging growth company

Accelerated filer   
Small reporting 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

As of June 30, 2018, the last business day of the Registrant's most recently completed second fiscal quarter, the aggregate market value of the Registrant's common stock held by non-affiliates based upon the closing price of such shares on The Nasdaq Global Market on such date was \$318.3 million.

As of January 31, 2019, 21,494,217 of shares of common stock were outstanding.

**DOCUMENTS INCORPORATED BY REFERENCE**

The information required by Part III of this report, to the extent not set forth herein, is incorporated in this report by reference to the registrant's definitive proxy statement relating to its 2019 annual meeting of stockholders. The definitive proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2018.

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As used in this report, the terms “Impinj,” “the Company,” “we,” “us” and “our” refer to Impinj, Inc., unless the context indicates otherwise.

#### **NOTE REGARDING FORWARD-LOOKING STATEMENTS**

This report contains certain 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 containing words such as “may,” “believe,” “anticipate,” “expect,” “intend,” “plan,” “project,” “projections,” “business outlook,” “estimate,” or similar expressions constitute forward-looking statements. You should read these statements carefully because they discuss future expectations, contain projections of future results of operations or financial condition or state other “forward-looking” information. These statements relate to our future plans, objectives, expectations, intentions and financial performance and the assumptions that underlie these statements. They include, but are not limited to, statements about:

- our market opportunity; the adoption of RAIN RFID technology and solutions; our ability to compete effectively against competitors and competing technologies; and our market share and technology leadership;
- our future financial performance, including our average selling prices and gross margins, and future macroeconomic conditions;
- the performance of third parties on which we rely for product manufacturing, assembly and testing; and our relationship with third parties on which we rely for product distribution, sales, integration and development;
- our ability to adequately protect our intellectual property; the regulatory regime for our products and services; and
- our participation in standards setting and other industry consortia.

Our actual results may differ materially from those contained in or implied by any forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this report, including those factors discussed in Part I, Item 1A (Risk Factors).

In light of the significant uncertainties and risks inherent in these forward-looking statements, you should not regard these statements as a representation or warranty by us or anyone else that we will achieve our objectives and plans in any specified time frame, or at all, or as predictions of future events. Moreover, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

**Item 1. Business****Overview**

Our vision is digital life for everyday items. We are driving toward a future in which everyday physical items have digital counterparts, digital twins, in the cloud, and in which businesses and people engage with trillions of those everyday physical items via their digital twins. Our mission is to deliver a platform that powers that item-to-cloud connectivity, enabling developers to innovate Internet-of-Things, or IoT, applications on our platform. Today, we deliver the identity, location and authenticity of billions of physical items; our future is enabling those cloud-based digital twins, each storing an individual item's ownership, history and links, and enabling ubiquitous access to them. We believe the item-to-cloud connectivity we will deliver will enhance businesses efficiencies and commerce and, ultimately, improve peoples' lives.

**Opportunity**

Our platform connects individual items, capturing and delivering data about each item from manufacturing, through distribution to sale. We envision a future where we extend and deliver an item's digital life to the person that purchases and owns it. We and our channel partners connect items via a miniature radio chip embedded in the item or in its packaging, reading and delivering the item's unique identity, location and authenticity to business and consumer applications. To date, we have enabled connectivity to more than 30 billion items, enabling retailers, hospitals, airlines, automotive manufacturers, supply chain and logistics, and business in many other industries to derive timely business value from those connected items. Our opportunity is to connect billions, ultimately possibly trillions of everyday items, and to deliver valuable information about these items not just to businesses, but also to everyday people.

Our platform connects everyday items using RAIN, a radio-frequency identification, or RFID, technology we pioneered. We spearheaded development of the RAIN radio standard, lobbied governments to allocate frequency spectrum and cofounded the RAIN Industry Alliance which today has more than 160-member companies. Today, the RAIN RFID industry uses the RAIN radio standard nearly exclusively, has access to radio spectrum freely available in 78 countries encompassing roughly 96.5% of the world's GDP and has connected tens of billions of items. We believe RAIN's core capabilities – unique identifiers for individual items, battery-free operation, low cost, 30-foot range, not line-of-sight, 1,000 reads per second, designed to have essentially unlimited life and available cryptographic item authentication – position RAIN to be the leading item-to-cloud connectivity technology for the IoT.

RAIN market adoption has historically been slower than anticipated or forecasted by us and industry sources. For additional information related to RAIN market adoption, please see the section of this report captioned "Risk Factors."

**Impinj Platform**

Our platform comprises endpoint integrated circuits, or ICs, connectivity and software that together deliver item data to business applications. We link the layers of our platform to deliver advanced capabilities and performance that surpasses mix-and-match solutions built from competitor products. Within each layer we sell one or more product families.

***Endpoint ICs***

Our endpoint IC product family, branded Monza, comprises a family of miniature radios-on-a-chip that attach-to and uniquely identify their host items. Monza ICs include a number to identify a host item and may also include features such as user data storage, security, authentication, loss prevention, consumer privacy and value-added Impinj custom features, all accessible by our platform. Our Monza ICs power themselves from a reader's radio waves so they do not need a battery, can wirelessly connect almost any item, are readable at distances up to 30 feet without line-of-sight, yet sell for pennies.

Our original equipment manufacturing, or OEM, partners typically attach each Monza IC to a thin printed or etched antenna on a paper or Mylar backing, then cover the composite inlay with a paper face to form a tag. End customers attach the tag to an item in markets including retail, healthcare, automotive, supply chain and logistics, industrial and manufacturing, consumer experience, food, datacenter, travel and banking. In some more-recent applications, rather than attaching a tag to an item, end customers may instead embed the inlay directly into the item, for example, sewing an inlay into a garment's care label. Regardless of the method by which our partners embed a Monza IC into a host item, we refer to a Monza IC and its host item as an endpoint.

When a consumer purchases a retail item, a store or supplier typically procures another item to sell, including another Monza IC. We believe endpoint ICs are the first market for consumable silicon and are a recurring revenue source for us.

### ***Connectivity***

Our connectivity offering comprises a family of reader ICs and modules, readers and gateways that wirelessly identify, locate, authenticate and engage items. Our connectivity products wirelessly provide power to, and communicate bidirectionally with, endpoint ICs on those items, identifying and locating up to 1,000 items per second.

Readers read, write, authenticate or otherwise engage endpoint ICs on items. Gateways integrate stationary readers with scanning antennas to locate and track items. Our readers and gateways are easy to deploy and use, can be powered via power-over-Ethernet and are certified for operation in more than 40 countries. Our customers have deployed our readers and gateways in applications ranging from retail inventory-taking to automated fuel filling to shipping-container tracking to airport luggage handling.

Our reader ICs and modules, branded Indy, comprise a suite of ICs and modules, the latter combining our reader ICs with peripheral circuitry in an easy-to-use format. We sell our reader ICs and modules to OEM and original design manufacturing, or ODM, partners that use them in a variety of products such as mobile or handheld readers, fixed readers, gateway, and RAIN-enabled appliances. We offer easy-to-use APIs, development environments, sample code, drivers and libraries. We sell our reader ICs and modules for tens of dollars.

Our reader product family, branded Speedway, comprises high-performance finished products. We sell our Speedway readers through an established channel of distributors, system integrators, or SIs, value-added resellers, or VARs, and solution providers. Our readers sell for hundreds of dollars.

Our gateway product family integrates our Speedway readers with beamforming antennas to electrically steer a radio beam like a searchlight. Their always-on, autonomous operation delivers timely item data without ongoing labor costs. Our portal gateways, branded xPortal and xSpan, scan doorways or hallways such as front-to-back store transitions, entryways and exits. Our array gateway, branded xArray, scans up to 1,500 square feet of floor space such as in a store, manufacturing facility or a hospital room. Our gateways sell for thousands of dollars.

### ***Software***

Our primary software offering, ItemSense, is a distributed operating system for our platform. ItemSense transforms item-level RAIN data into actionable business information, enabling analytics and insights about items businesses manufacture, transport and sell. ItemSense's key capabilities include enterprise-class RAIN deployment management and health monitoring; software-defined algorithms for item inventory, location and motion determination; and easy-to-use and integrate APIs that enable application developers to quickly build powerful IoT solutions on our platform.

### **Industry Use Cases**

The following use cases are representative of actual RAIN deployments we serve today.

## **Retail**

Retailers, both traditional “brick-and-mortar” and online, are consuming billions of tags each year to obtain real-time data about products they manufacture, transport and sell. By using our platform retailers can obtain these benefits:

- *Inventory Accuracy and Visibility* . Our platform delivers accurate and timely data about a retailer’s inventory, delivering visibility into what items a retailer has and where the items are located. Accurate inventory data can reduce overstocks and understocks, eliminate searching and avoid confusion, thereby allowing staff to focus on customers.
- *Omnichannel Operations* . Omnichannel retailing is about selling products when, where and how customers want to buy—but retailers can’t sell what they can’t see. The cornerstone of a successful omnichannel operation is real-time inventory visibility that provides accurate item information in stores and distribution and fulfillment centers. With real-time inventory visibility delivered by our platform, omnichannel retailers can efficiently sell inventory distributed across all their retail locations.
- *Store Operations* . Accurate inventory data are key to an efficient, optimized retail organization. But many retailers are stuck doing things the old way—manually counting items, and the data are outdated soon after they complete a cycle count. The Impinj platform delivers timely information about items in retail stores and warehouses, enabling retailers to confidently sell down to the last item in stock, know what products are popular, and help customers shop in their stores.
- *Enhanced Shopper Experiences* . Capturing customers’ attention as they step foot into a store with seamless interactive item-based experiences helps sell those items. The Impinj platform enables interactive in-store applications such as digital signs, magic mirrors and self-checkout kiosks. These interactive applications grab customers’ attention, provide information during the buying decision and keep shoppers engaged in the store.
- *Loss Identification and Analytics* . The same platform capabilities that give retailers inventory visibility can also improve loss prevention. With the Impinj platform, retailers can be alerted when items enter or leave specific zones within a store. Item identification, location and movement data can help retailers make smart decisions to protect their inventory and avoid lost sales due to missing inventory.

## **Supply Chain and Logistics**

The supply chain and logistics industry is increasingly demanding smarter, simpler and more automated operations. Using the Impinj platform they can obtain these benefits:

- *Shipment Verification* . The Impinj platform provides real-time data about items passing through dock doors to the systems that run shipping and receiving, enabling logistics companies to reduce mistakes, automate processes and drive operational efficiencies.
- *Returnable Transit Item (RTI) Tracking* . By tagging RTI containers that travel in and out of warehouses, the Impinj platform can reduce RTI loss and ensures a business has the RTI containers it needs to satisfy its customers.
- *Asset Management* . The Impinj platform enables automated check-in and -out procedures, maintenance alerts and location monitoring, improving efficiencies, reducing loss and complying with maintenance schedules.

## **Other Industries**

Other industries are also deriving business value from RAIN. A few examples of deployments that use part or all of the Impinj platform include:

- *Aviation* . RAIN-enabled luggage tags provide passengers with real-time location of their checked bags and reduce lost bags.
- *Automotive* . Car manufacturers track components to ensure proper assembly, reduce labor costs and improve operations.

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- *Healthcare* . Hospitals use the Impinj platform for tracking assets and managing patient and clinician workflows. Partner solutions built on our platform include RAIN-enabled medical cabinets, refrigerators and medical - kit verification.
- *Industrial and Manufacturing* . Manufacturers track assets and tools to improve efficiency by reducing errors and decreasing missed tool calibrations. Industrial companies track components during manufacturing and shipping to increase productivity and reduce shipping errors.
- *Sports* . Marathons and other foot races track runners via endpoint ICs in race bibs and golf venues score participants' shots via endpoint ICs inside golf balls.
- *Food* . Coca-Cola uses our endpoint and reader ICs for syrup tracking and replenishment in its Freestyle soda fountains. In Europe, McDonald's uses our endpoint ICs and gateways to enable direct-to-table food service.
- *Datacenter* . Datacenters use our platform for asset tracking. Electronics manufacturers embed our endpoint ICs into electronic devices for processor-secured storage.
- *Travel* . Driver licenses in some states in the United States include our endpoint ICs to speed border crossings. Fueling stations use vehicle windshield tags to enable automatic and cashless fueling.
- *Banking* . Banks use our endpoint ICs for money bundles and to track information technology assets.
- *Linen and Uniform Tracking* . Laundry providers automatically track linens and uniforms to ensure the items don't go astray, reduce safety stock and keep supply matched to customer needs.

## **Competitive Advantages**

We lead the RAIN RFID market in connecting and delivering information about items. We believe we can maintain and extend our leadership position as the market grows by leveraging our competitive strengths, including:

- *Comprehensive Platform* . Impinj products provide enhanced features and functionalities, and integrate more tightly together, in ways that we believe are unequaled by "mix-and-match" systems cobbled-together from competitors' components, thereby improving performance, reliability and ease-of-use.
- *Market Leadership* . We believe we are the only company with an integrated RAIN platform, and believe we have leading market share in endpoint ICs, reader ICs and stationary readers.
- *Broad Partner Ecosystem* . Our worldwide partner ecosystem comprising hundreds of distributors, SIs, VARs, software solution partners, inlay and tag OEMs and ODMs gives us market reach, penetration and scalability we believe few, if any, of our competitors enjoy.
- *Technology Leadership* . Our chief executive officer is a recognized industry thought leader. He is a director of the RAIN Industry Alliance and was editor for the RAIN radio standard. Our intense focus on RAIN has enabled us to be first-to-market with innovative, high-performing and high-quality products. As of December 31, 2018, our intellectual property portfolio included 247 issued and allowed U.S. patents, two issued and allowed international patents, 27 pending U.S. patent applications and one pending international patent application.
- *Trusted Brand* . We believe our industry leadership, name recognition and reputation for innovative, high-performing and high-quality products have significantly contributed to our leading market position. We believe our brand is unmatched in the industry, helping us sell products and maintain our market leadership.

## **Growth Strategies**

To further our mission of connecting everyday items, we plan to focus on the following strategic areas:

- *Continue Investing in Our Platform* . We have made significant investments and plan to continue investing in platform functionality; software/hardware linkages; broadening our software capabilities;

enhancing our algorithms and capabilities for item authentication, loss prevention and shipment verification; and reducing costs.

- *Drive End-User Adoption* . We plan to deepen our platform integration with software partners, broaden our partner ecosystem and expand our solutions focus and offerings, focused on driving end-user adoption.
- *Expand within our Customer Base by Cross-Selling and Up-Selling Our Platform* . We will seek additional revenue from existing end users of our platform by helping them expand their deployment scope and add new use cases. For example, typical retailer RAIN deployments start by tagging primarily apparel items and taking inventory using handheld readers. We see opportunities not only to expand tagging to housewares, appliances, cosmetics and eventually all items in a store, but also to automate inventory-taking using fixed reading and to deliver enhanced use cases such as omnichannel fulfillment, loss prevention and more.
- *Enable Ubiquitous Reading* . We plan to invest in next-generation reader ICs to improve functionality, reduce costs, and make Impinj-based readers ubiquitous in industrial and consumer devices and facilities infrastructure.

## Sales and Marketing

Our go-to-market model prioritizes brand development, end-user awareness, lead generation and sales enablement. Our communications use web, electronic and channel programs complemented by press initiatives and industry-analyst relationships. Our solutions-marketing, business-development and solutions-architecture teams work with our partner independent software vendors, or ISVs, to enable joint solutions and go-to-market selling.

We deliver products and solutions that are easy for our partner ecosystem to sell and deploy. We engender preference for our platform in all sales engagements, encouraging end users to deploy our multiple products to gain full benefit from our platform. Our business development, product marketing, technical and systems engineers all actively engage partners and end customers.

Our sales force leverages a global partner ecosystem of distributors, SIs, VARs and ISV partners. We also have a number of worldwide sales team members with expertise in endpoint ICs and reader ICs and modules. Because our operating-system software is still relatively new to the market, the revenue we derive from software is small, so we currently derive most of our revenue from endpoint IC and connectivity product sales. We sell our products as follows:

- Endpoint ICs directly to inlay and tag OEMs and ODMs. We typically negotiate pricing, volumes and deliveries with these OEMs and ODMs annually , with new pricing effective during the first quarter of the calendar year.
- Reader ICs and modules primarily through distribution to reader OEMs and ODMs.
- Readers and gateways primarily to VARs and SIs through distributors.
- Software through distributors, VARs, SIs and other software-solution partners.

The following table presents total revenue concentrations to Avery Dennison Corporation, or Avery Dennison, Smartrac NV, or Smartrac, Arizon RFID Technology (Yangzhou) Co., LTD, or Arizon, Shang Yang RFID Technology Yangzhou Co. Ltd., or Shang Yang, and Blue Star, Inc., or Blue Star, for the periods presented:



	Year Ended December 31,		
	2018	2017	2016
<b>Revenue:</b>			
Avery Dennison	22%	18%	14%
Smartrac	17	14	16
Arizon	10	13	11
Shang Yang	*	*	10
Blue Star	*	10	*
	49%	55%	51%

\* Less than 10%

We engage directly with end users in collaboration with partners across our ecosystem, usually fulfilling sales through those same partners. In some instances, these end-customer engagements leverage go-to-market relationships with companies who do not sell our products but whose product offerings complement ours. Many of our partners sell multiple of our products or our entire platform.

### Manufacturing

We outsource all our product manufacturing to third-party manufacturers that build our products to our design specifications. This capital-efficient operating model scales efficiently with volume, allowing us to focus our resources on accelerating development of new products and solutions.

Taiwan Semiconductor Manufacturing Company Limited, or TSMC, fabricates our endpoint IC wafers in Asia and the United States and has been our sole endpoint IC wafer supplier since 2003. We order endpoint IC wafers on a purchase-order basis and do not have a long-term agreement with TSMC. We test the wafers at our U.S. headquarters and in Asia. We use multiple subcontractors to post-process the wafers, with Stars Microelectronics (Thailand) Public Company Limited, or Stars, our primary subcontractor. We generally engage all our endpoint IC subcontractors on a purchase-order basis.

TowerJazz Ltd., or TowerJazz fabricates our reader IC wafers in the United States and has been our sole reader IC wafer supplier since 2008. We order reader IC wafers on a purchase-order basis and do not have a long-term agreement with TowerJazz. We use subcontractors on a purchase-order basis to package the ICs and test the packaged parts. Stars and Microelectronics Technology Inc., or MTI, manufacture our modules. We do not have a long-term manufacturing agreement with either.

Plexus Corp., or Plexus, manufactures our readers in Asia and has been our sole supplier since 2005. Plexus and Western Corporation (acquired by Computrol, Inc.) in the United States have manufactured our gateways since 2013 and 2010, respectively. We order readers and gateways pursuant to non-exclusive purchase agreements that renew automatically each year, subject to each party's right to terminate upon 180 days' notice. We engage subcontractors on a purchase-order basis to assemble and test printed circuit boards, to build our reader and gateway enclosures and test our readers and gateways.

### Research and Development

We built our company around technology leadership and innovation. We have committed, and plan to continue committing, significant resources to technology and product innovation and development. We achieved our market leadership by innovating, delivering and continuously improving product performance, features, quality and reliability while also reducing costs. In most situations, we strive to lead the market with new innovations, but we sometimes adopt a "fast follower" approach depending on the market situation. As one example, endpoint IC performance typically improves when we migrate the semiconductor processing to more advanced process nodes. We execute these node migrations when the development costs, performance improvements, competitive situation and product cost reductions justify the migration. But external factors, such as the ability of our OEM and ODM partners to process larger wafers with smaller ICs can cause us to delay, or even allow our competition to temporarily lead, while we develop advanced products that we introduce when our OEM and ODM partners are ready.

We have assembled a team of skilled engineers and currently perform all research and most of our product development internally. As of December 31, 2018, we had 122 employees in research and development. We regularly review our technology, products and market development opportunities and reallocate our spending and resources accordingly.

### **Intellectual Property**

We protect our technologies by filing patent applications, retaining trade secrets and defending and enforcing our intellectual property rights where appropriate. To date, our intellectual property portfolio includes 247 issued and allowed U.S. patents, two issued and allowed international patents, 27 pending U.S. patent applications and one pending international patent application. The first of our 221 issued utility patents expire in 2022 and the first of our 26 issued design patents expire in 2021. To protect confidential information not otherwise subject to patent protection, we rely on trade secret law and enter into confidentiality agreements with our employees, customers, suppliers and partners.

Because most RAIN product SKUs are used in, or imported into, the United States, and because many of our partners and end customers have U.S. operations, we believe U.S. patents hold the most value for our business. Consequently, we have filed primarily U.S. patent applications. We have two issued and allowed international patents. Because our portfolio currently comprises mostly U.S. patents, we have limited ability to assert our intellectual property rights outside the United States.

Although our patents and trade secrets constitute valuable assets, we do not view any one of them as material. Instead, we believe the totality of our patent and trade-secret portfolio creates an advantage for our business.

We have entered into licensing, broad-scope cross licensing and other agreements authorizing us to use or to operate within the scope of patents and intellectual property owned by third parties. For example, we have licenses to third-party intellectual property that we use in our products. As another example, by participating in developing GS1 EPCglobal protocols, such as the RAIN radio protocol, we agreed to license those of our patents necessarily infringed by the practice of these protocols on a royalty-free basis to other GS1 EPCglobal members, subject to reciprocal royalty-free rights from those members. By participating in developing International Organization for Standardization, or ISO, standards, we agreed to grant to all users worldwide a license to those of our patents necessarily infringed by the practice of several ISO standards, including non-RAIN standards, on reasonable and nondiscriminatory terms, subject to reciprocity.

We own a number of trademarks, develop names for our new products and secure trademark protection for them, including domain name registration, in relevant jurisdictions.

### **Alliances and Standardization**

Our platform connects everyday items using the RAIN RFID technology we pioneered. We spearheaded development of the RAIN radio standard, lobbied governments to allocate frequency spectrum and, along with Google, Intel and Smartrac, cofounded the RAIN Industry Alliance. Our chief executive officer is presently an Alliance Director and was previously the Alliance Chairman. The Alliance is a global organization promoting the universal adoption of RAIN technology and solutions with more than 160 members as of December 31, 2018. The name “RAIN” connotes ubiquity and a close link to cloud data. Today, the RAIN RFID industry has access to radio spectrum freely available in 78 countries encompassing roughly 96.5% of the world’s GDP and has connected tens of billions of items. We believe RAIN’s core capabilities – unique identifiers for individual items, battery-free operation, low cost, long range, not line-of-sight, 1,000 reads per second, designed to have essentially unlimited life and available cryptographic item authentication – position RAIN to be the leading item-to-cloud connectivity technology for the IoT.

We, our customers, partners and competitors developed the RAIN radio protocol, whose technical name is EPC™ Radio-Frequency Identity Protocols Generation-2 UHF RFID (standardized as ISO/IEC 18000-63 and known colloquially as Gen2) in 2004, with us as the editor. Our community delivered a backwards-compatible update in 2013, again with us as the editor. Our industry uses the RAIN radio protocol nearly exclusively.

By participating in GS1 EPCglobal, which produced Gen2, and ISO, which ratified 18000-63, as well as in other standards bodies, we agreed to license certain patents as described in the section captioned “Intellectual Property.”

## Government Regulations

Government regulations require us to certify our readers and gateways in jurisdictions where they operate. For example, we certify our readers and gateways to Federal Communications Commission regulations to operate in the United States and its territories. Currently, our Speedway readers are certified for operation in more than 40 countries worldwide including the United States, Canada, Mexico, China, Japan, South Korea and all of the European Union. Our gateway products have the same or fewer certifications, depending on the recency of the product introduction; we plan to eventually certify them in all countries with compelling market opportunities.

## Competition

We believe we are the only company in our industry with a platform spanning endpoint ICs, connectivity and software. Individual competitors compete with us with respect to some, but not all, of the platform layers. Our principal competition in our platform layers include:

- *Endpoint ICs.* NXP B.V., or NXP, and Alien Technology Corporation, or Alien.
- *Reader ICs.* STMicroelectronics N.V., Phychips Inc and Zhikun Semiconductor Co. Ltd, or Iotelligent.
- *Readers and Gateways.* Alien, which also purchases our reader ICs, and Zebra Technologies Corporation, or Zebra.
- *Software.* Zebra and Mojix, Inc.

The market for our platform and products is relatively new and highly competitive. We believe competition will increase as the market grows and RAIN technology continues to advance. New entrants could come into our market at any time, creating additional competition in the future. The competitive factors that impact our platform and product sales include:

- portfolio, performance, features, lead times, reliability and price;
- support, ease of use and availability of reference designs;
- development tools and API availability (except in the endpoint IC market);
- integration and certification with end-user applications; and
- company reputation.

Although we believe we compete favorably on the above factors, our future competitiveness will depend upon our ability to design, develop and deliver compelling solutions. We occasionally experience competitive pressures due to prevailing exchange rates as our product pricing is denominated in U.S. dollars. In addition, our competitive position depends on our ability to continue to attract and retain talent while protecting our intellectual property. For additional information on the risks associated with our business, see “Risk Factors.”

## Employees and Culture

As of December 31, 2018, we had 282 employees. None of our employees are represented by a labor union, and we believe our employee relations are excellent.

Our corporate culture is captured by a set of beliefs centered around collaboration, accountability and being bold. We believe our culture is essential to the health and success of our business and aligns our employees around a set of principles, behaviors and actions that foster inclusion, passion and commitment.

## Corporate Information

We were incorporated in Delaware in April 2000. Our principal executive office is located at 400 Fairview Avenue North, Suite 1200, Seattle, Washington 98109. Our telephone number is (206) 517-5300. Our website is [www.impinj.com](http://www.impinj.com). Information contained in, or that can be accessed through, our website is not a part of, and is not incorporated into, this report.

## Where You Can Find More Information

Our filings with the Securities and Exchange Commission, or SEC, including our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports, are available on our website at [www.investor.impinj.com](http://www.investor.impinj.com) as soon as reasonably practicable after the electronic filing of these reports with the SEC. The information contained on our website is not a part of this report or any other document we file with the SEC.

## Item 1A. Risk Factors

*You should carefully consider the following risk factors, in addition to the other information contained in this report, including the section of this report captioned “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our financial statements and related notes. If any of the events described in the following risk factors and the risks described elsewhere in this report occurs, our business, operating results and financial condition could be seriously harmed. This report also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this report.*

### Risks Relating to Our Business and Industry

***RAIN market adoption is uncertain. If RAIN market adoption does not continue to develop, or develops more slowly than we expect, our business will suffer.***

The RAIN market is relatively new and, to a large extent, unproven. RAIN technology and product adoption, including that of Impinj’s products and platform, will depend on numerous factors, including:

- whether end users embrace the benefits we believe RAIN offers, and if so whether RAIN will achieve and sustain high demand and market adoption;
- whether end users perceive that the benefits of RAIN adoption outweigh the cost and time to install, replace or modify their existing systems and processes; and
- whether the technological capabilities of RAIN products and applications meet end users’ current or anticipated needs.

The adoption of RAIN technology and products has historically been slower than anticipated or forecasted by us and industry sources. Our industry has also experienced periods of accelerated adoption that were not sustained. For example, RAIN adoption accelerated rapidly in 2016, which resulted in longer lead times. We invested in endpoint IC inventory both to meet forecasted demand and to enhance our ability to deliver in the event of another unexpected demand surge. However, in the second half of 2017, the growth rate in endpoint IC shipments decelerated, which we believe was due to multiple factors including, but not limited to, delays in new deployments and in planned expansions at several large retailers.

The pace of RAIN adoption will turn on prospective customers’ knowledge of our products and our ability to convey to them the real value of using RAIN products or platforms over those incorporating other technologies. End users and our prospective customers may not be familiar with our products or RAIN in general, or may use other products and technologies to identify, locate, authenticate, engage, track and prevent loss of their items. Additionally, even if prospective customers are familiar with RAIN, our products or platform, a negative perception of, or experience with, RAIN or a competitor’s RAIN products may deter them from adopting RAIN or our products or platform. Before they adopt RAIN, businesses, government agencies and other organizations may need education on the benefits of using RAIN in their operations, and how they outweigh the costs, including potentially significant costs of modifying or replacing existing systems and processes. These educational efforts may not be successful, and organizations may decide that the costs of adopting RAIN outweigh the benefits or may decide to defer near-term RAIN adoption in favor of a more advanced or comprehensive future deployment. Failure of organizations to adopt RAIN generally, and our products and platform specifically, for any reason will hurt the development of our market and, consequently, impair our business and prospects.

Fluctuations in the adoption of RAIN products and solutions may affect our ability to forecast our future operating results, including revenue, gross margins, cash flows and profitability. Moreover, to ensure adequate inventory supply, we must forecast inventory needs and expenses and place orders sufficiently in advance with our suppliers and contract manufacturers based on our estimates of future demand for particular products. Our failure to accurately forecast demand may cause us to experience excess inventory levels or a shortage of products available for sale.

***If RAIN adoption by retailers does not continue at the rate we expect, our business will be adversely affected.***

The retail apparel industry leads RAIN adoption, and retail end users were the largest consumers of our endpoint ICs in 2016, 2017 and 2018. We believe retail RAIN deployments are a leading indicator of overall RAIN market adoption. If large apparel retailers in particular continue adopting RAIN, then we believe adoption in other industries is likely to accelerate. As such, the retail industry is one of our key strategic focus areas.

If retailers or others deploying RAIN fail to realize demonstrable benefits from RAIN or delay or abandon their deployments, overall RAIN market acceptance may be materially and adversely affected. For example, in 2017, the growth rate in endpoint IC shipments decelerated, which we believe was due to multiple factors including, but not limited to, delays in new deployments and in planned expansions at several large retailers. Moreover, retailers that have a primarily physical presence in the marketplace have experienced financial stress in recent periods. Many of these retailers have deployed RAIN to improve competitiveness; however, if they fail to compete effectively, the number of stores they maintain, and thus the scope of their RAIN deployments, may decrease significantly. Any widespread delay, slowdown or failure by retailers or other organizations to implement RAIN-based systems generally, and our products and platform specifically, will materially and adversely affect our business, operating results, financial condition and long-term prospects.

***If we are unsuccessful in fostering meaningful adoption of our products and platform by end users other than retailers, our business prospects may be adversely affected.***

We expect end users to deploy our platform in sectors beyond retail, including, for example in supply chain, aviation and healthcare. If we fail to make our products and platform an easy-to-deploy, economical solution for use cases in these other sectors, our ability to penetrate them may suffer and our business prospects may be adversely affected.

***We have a history of losses and have only achieved profitability intermittently. We cannot be certain that we will increase or sustain profitability in the future.***

We have incurred losses since our inception in 2000. While we were profitable between 2013 and 2015, we had a net loss of \$35.2 million for the year ended December 31, 2018 and an accumulated deficit of \$239.8 million as of December 31, 2018. Our ability to regain or sustain profitability depends on numerous factors, many of which are out of our control, including continued RAIN adoption, our market share and our margins. We expect significant expenditures to support operations, product development, and business and headcount expansion in sales, engineering, and marketing as a public company. If we fail to increase our revenue or manage our expenses, we may not increase or sustain profitability in the future.

***Fluctuations in our quarterly and annual operating results may adversely affect our business, prospects and stock price.***

You must consider our business and prospects in light of the risks and difficulties we encounter in the uncertain and rapidly evolving RAIN market. Because this market is new and evolving, predicting its future growth rate and size is difficult. The rapidly evolving nature of the markets in which we sell our products, as well as other factors that are beyond our control, reduce our ability to accurately evaluate our future prospects and forecast quarterly or annual performance.

End users drive demand for our products. Because we sell nearly all of our products through channel partners, our ability to determine and forecast end-user demand is limited.

For example, our 2016 endpoint IC sales exceeded both our expectations and those of our industry's analysts due in large part to several coincident large-scale deployments. However, in the second half of 2017 the growth rate of endpoint IC shipments decelerated, which we believe was due to multiple factors including delays in new deployments and in planned expansions at several large retailers. That decelerating growth engendered an endpoint IC channel inventory correction.

Forecasting end-user demand for other elements of RAIN solutions is also difficult. We rely on our channel partners to integrate our RAIN-based systems products with end-user information systems and this integration has been uneven and unpredictable in scope, timing and implementation. Also, RAIN-based systems in general often involve time-consuming proofs-of-concepts and other time-consuming steps such as designing and implementing new business processes, which make sales of our system products difficult to forecast. Partly as a consequence, in the past, both we and other industry participants have at times overestimated the RAIN market size and growth rates, then failed to meet expectations.

To date, we have had limited success in accurately predicting future sales of our products and platform. Due to our shorter lead-times for endpoint ICs in 2018 relative to prior years, we are increasingly receiving customer orders and shipping the products within a quarter. A shortened sales cycle decreases our ability to accurately predict both optimal inventory supply and order volume for a quarter. Additionally, customer orders for readers and gateways are generally weighted toward the end of a quarter. If we do not have adequate supply of readers and gateways to fulfill the orders within a quarter or if we do not accurately predict the sales cycle for reader and gateways, sales of some sizeable transactions might extend into a subsequent quarter. We expect that for the foreseeable future our visibility into future sales, including both volumes and prices, will continue to be limited. This poor visibility may cause fluctuations in our operating results, particularly on a quarterly basis, that we are unable to predict as well as failure to achieve our expected operating results.

In addition, if endpoint IC sales (one indicator of market adoption) exceed expectations or if we discount prices to win a particularly large opportunity or in response to competition, our revenue and profitability may be positively affected, but gross margins may be negatively affected depending on product mix for the applicable period. If research analysts or investors perceive such product mix shift negatively, the trading price of our common stock could be adversely affected.

Numerous other factors, many of which are outside our control, may cause or contribute to significant fluctuations in our quarterly and annual operating results. These fluctuations may make financial planning and forecasting difficult. In addition, these fluctuations may result in unanticipated decreases in our available cash, which could negatively affect our business and prospects. Factors that may contribute to fluctuations in our operating results and revenue include:

- variations in RAIN adoption and deployment delays by end users;
- fluctuations in demand for our products or platform, including by tag manufacturers and other significant customers on which we rely for a substantial portion of our revenue;
- fluctuations in the available supply of our products;
- variations in the quality of our products and return rates;
- declines in selling prices for our products;
- delays in our product-shipment timing, customer or end-user sales or deployment cycles, or work performed under development contracts;
- intellectual property disputes involving us, our customers, end users or other participants in our industry;
- adverse outcomes of litigation or governmental proceedings;
- timing variability in product introductions, enhancements, services, and technologies by us and our competitors and market acceptance of these new or enhanced products, services and technologies;
- unanticipated excess or obsolete inventory as a result of supply-chain mismanagement, new-product introduction, quality issues or otherwise;
- changes in the amount and timing of our operating costs, including those related to the expansion of our business, operations and infrastructure;
- changes in business cycles or seasonal fluctuations that may affect the markets in which we sell;
- changes in industry standards or specifications, or changes in government regulations, relating to RAIN, or Impinj's products or platform;

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- late, delayed or cancelled payments from our customers; and
- unanticipated impairment of long-lived assets and goodwill.

A substantial portion of our operating expenses are fixed for the short term, and as a result, fluctuations in revenue or unanticipated expenses can have a material and immediate impact on our profitability. The occurrence of any one of these risks could negatively affect our operating results in any particular period, which could cause the price of our common stock to decline.

### ***Our market is very competitive. If we fail to compete successfully, our business and operating results will suffer.***

We face significant competition from both established and emerging competitors. We believe our principal current competitors are: in readers and gateways, Zebra and Alien; in reader ICs, STMicroelectronics N.V., Phychips Inc. and Iotelligent; and in endpoint ICs, NXP and Alien. Our channel partners, including distributors, system integrators, or SIs, value-added resellers, or VARs, and software solution partners, may enter our market and compete with us rather than purchase our products, which would not only reduce our customer base but also increase competition in the market, adversely affecting our operating results, business and prospects. In addition, companies in adjacent markets or newly formed companies may decide to enter our market, particularly as RAIN adoption grows.

Competition for customers is intense. Because the RAIN market is evolving rapidly, winning customer and end-user accounts at an early stage in the development of the market is critical to growing our business. End users that instead use competing products and technologies may face high switching costs, which may affect our and our channel partners' ability to successfully convert them to our products. Failure to obtain orders from customers and end users, for competitive reasons or otherwise, will materially adversely affect our operating results, business and prospects.

Some of our competitors may devote more resources than we can to the development, promotion, sale and support of their products. Our competitors include companies that have much greater financial, operating, research and development, marketing and other resources than us. These competitors may discount their products to gain market share. In doing so, they could simply accept smaller margins, or they could maintain margins by achieving cost savings through better, more efficient designs or production methods. To gain share, competitors could also bundle near-field communication, or NFC, products with RAIN products, or stationary readers with handheld readers. New competitors could enter the gateway market or develop RAIN platforms or solutions. Larger or more established companies may deliver and directly compete with our products or platform. Smaller companies could launch new products and applications we do not offer and could gain market acceptance quickly. Moreover, consolidation in the RAIN industry could intensify the competitive pressures that we face. Many of our existing and potential competitors may be better positioned than we are to acquire other companies, technologies or products.

Some of our customers have policies requiring diverse supplier bases to enhance competition and maintain multiple RAIN product providers. They do not have an interest in purchasing exclusively from one supplier or promoting a particular brand. Our ability to increase order sizes from these customers and maintain or increase our market share is constrained by these policies. In addition, any decline in quality or availability of our products or any increase in the number of suppliers that such a customer uses may decrease demand for our products and adversely affect our operating results, business and prospects.

In short, as the RAIN market develops, we will face ever increasing competition from new or newly enhanced products from our existing competitors, or from entirely new competitors in our market. These competitors may have, or may develop, processes or product designs that will enable them to offer more competitive products than ours. Any failure to compete successfully will materially adversely affect our business, prospects, operating results and financial condition.

***Downturns in the industries we serve, particularly retail, may adversely affect our business.***

Worldwide economic conditions have exhibited significant fluctuations in the past, and customers remain guarded with respect to market volatility and uncertainty. As a consequence, we and our customers have had difficulty forecasting and planning future business activities accurately. Volatile economic conditions could cause our customers or end users to reduce their capital-expenditure budgets, which could decrease spending for our products resulting in delayed and lengthened deployment, a decrease in sales or a loss of sales opportunities. The retail industry is subject to volatility, especially during uncertain economic conditions. A downturn in the retail industry in particular may disproportionately affect us because retailers comprise a significant portion of the RAIN end users. We cannot predict the timing, strength or duration of any economic slowdown or recovery, whether global, regional or within specific markets. If the conditions of the general economy or markets in which we operate worsen, our business could be harmed.

***If we fail to obtain quality products in adequate quantity and in a timely and cost-effective manner, our operating results and growth prospects will be adversely affected.***

We do not own or operate manufacturing facilities, and we do not control our manufacturers' or subcontractors' ability or willingness to meet our supply requirements. Currently, all our endpoint IC wafers are manufactured by TSMC, and primarily post-processed by our subcontractor Stars; all our reader IC wafers are manufactured by TowerJazz; all our modules are manufactured by Stars and MTI; and all our readers and gateways are manufactured by Plexus Corp or Computrol Corporation. We also use subcontractors for post-processing, assembly and testing.

Currently, we do not have long-term supply contracts with TSMC, TowerJazz, MTI, Plexus or Computrol Corporation, and neither they nor our subcontractors are required to supply us with products for any specific period or in any specific quantity. Suppliers can allocate production capacity to other companies' and reduce deliveries to us on short notice. Our suppliers may allocate capacity to other companies, which could impair our ability to secure sufficient product supply for sale.

Some components of our products have longer lead times and we place orders with some of our suppliers five or more months before our anticipated product delivery dates to our customers. We base these orders on our customer-demand forecasts. If we inaccurately forecast this customer demand then we may be unable to obtain adequate and cost-effective components, or foundry or assembly capacity to meet our customers' delivery requirements, or we may accumulate excess inventory.

Manufacturing capacity may not be available when we need it or at reasonable prices, and this may result in us not being able to satisfy demand for our products fully, and distort apparent future demand. For example, in 2010 we experienced wafer shortages from TSMC relative to our submitted endpoint IC wafer purchase orders because of high worldwide demand for semiconductor foundry capacity. These shortages adversely affected our ability to meet our customers' demand and, in some cases, caused customers to cancel orders, qualify alternative suppliers or purchase from our competitors. As another example, in mid-2016, as a consequence of rapid growth in endpoint IC demand, we depleted our endpoint IC buffer stock and were temporarily unable to satisfy customer demand at that time, causing some customers to purchase competitive products even as we increased production. In response to similar future shortages, our customers may act similarly or, alternatively, may overbuy our products, which could artificially inflate sales in near-term periods while leading to sales declines in future periods as our customers consume their accumulated inventory.

At times, our suppliers ask us to purchase excess products to ensure we do not face a subsequent shortage. For example, in certain quarters of 2014, 2015 and 2016, we purchased more wafers from TSMC than we required, which affected our available cash for that quarter. In addition, we may invest significantly in inventory to support anticipated growth in our business, as we did with endpoint IC inventory in 2017. If we are unable to sell the additional inventory we purchased, or if we must sell it at lower prices due to excess inventory or obsolescence, our operating results may be adversely affected.



If our suppliers fail to deliver products at reasonable prices or with satisfactory quality levels, then our ability to bring products to market and our reputation could suffer. For example, if supplier capacity diminishes, including from a catastrophic loss of facilities or otherwise, we could have difficulty fulfilling our orders, our revenue could decline, and our growth prospects could be impaired. We anticipate requiring three to 18 months to transition our assembly services or foundries to new providers. Such a transition would likely require a qualification process by our customers or end users, which could also adversely affect our ability to sell our products and our operating results. Moreover, in the event of a suspected quality issue, the process of testing suspect products and diagnosing and fixing defects could be time consuming and costly and could constrain our ability to supply customers with products.

***If we are unsuccessful introducing new products and enhancements, our operating results will be harmed.***

To keep pace with technology developments, satisfy increasingly stringent end-user requirements and achieve market acceptance, we plan to introduce new products and solutions. We commit significant resources to developing these new products and solutions while improving performance, reliability and reducing costs. For example, we are investing substantial resources to develop and enhance our operating-system software but do not expect to realize material revenue from this software in the near future. The market for our software is nascent, and we need to create market awareness of its benefits to drive end-user adoption. Creating market awareness includes promoting our software as a foundation on which end users, ISVs, consultants, SIs, and others can develop applications that meet end-user needs and drive adoption. We may be late in delivering or improving our software to meet our partners' or end users' needs. In addition, we have limited experience developing and selling software products and cannot be certain that our proposed pricing model, sales strategy, or software quality and reliability will be successful. We rely on and must train our channel partners to sell, develop applications for and integrate our software with end users' systems, but we cannot guarantee that we or they will be successful doing so. We believe that we must continue to dedicate a significant amount of resources to our development efforts to develop and maintain our competitive position. We also cannot be certain that our software will generate revenue from these investments for several years, if at all, or that such revenue will exceed the investment we are committing to develop and deploy our software.

The success of a new or enhanced product is impacted by accurate forecasts of long-term market demand. For example, our xArray and xSpan gateways are relatively new products that incorporate enhanced technological features, but we cannot be certain whether demand for such gateways will develop as forecasted. We may also fail to anticipate or meet market requirements for new features and functionality. By focusing on certain new products and industries, we may miss opportunities for other products and applications that may be more widely adopted.

***If we are unable to develop new products and services using new or enhanced technologies, our competitive position will be adversely affected.***

In the future, we may not succeed in developing the underlying technologies or processes necessary to create new or enhanced products and services, or license or otherwise acquire these technologies from third parties. In some instances we may be late to market with our innovations, or may choose to be a "fast follower" but subsequently be unable to overcome the lead we gave to our competition. The success of a new or enhanced product depends on technological developments, market positioning and timing, as well as on various implementation factors, including:

- our timely and efficient completion of the design process;
- our timely and efficient implementation of manufacturing, assembly and testing procedures;
- product or service performance;
- product certification;
- our ability to attract, retain and manage technical personnel;
- the quality, reliability and selling price of the product or service; and
- effective marketing, sales and service.

If we are unable to develop new products, features and services to compete effectively, our market share could be adversely affected, which would harm our business, financial condition and operating results.

***An inability or limited ability of enterprise systems to exploit RAIN information may adversely affect the market for our products.***

A successful end-user RAIN deployment requires not only tags and readers or gateways, but integration with information systems and applications that derive business value from endpoint data. Unless technology providers continue developing and advancing business analytics tools, and end users install or enhance their information systems and applications to use these tools, deployments of RAIN products and applications could stall. Our efforts to foster development and deployment of these tools by providing software that delivers item-level data could fail. In addition, our guidance to business-analytics tool providers for integrating our products with their tools could prove ineffective.

Solution providers and systems integrators form an essential part of the RAIN market by providing deployment know-how to end users who are unable to deploy RAIN solutions on their own. Our efforts to train and support these solution providers and systems integrators could fail. Further, integrating our products with end-user information systems could prove more difficult or time consuming than we or they anticipate, which could delay deployments. If end users are unable to successfully exploit RAIN data, or if we are unable to support solution providers or systems integrators adequately, or if deployments of our platform are delayed, we could see a material adverse impact on our business, operating results, financial condition or prospects.

***Our reliance on a small number of customers could adversely affect our business and operating results.***

We sell our endpoint ICs directly to inlay and tag OEMs and ODMs. In 2018, sales to tag OEMs, Avery Dennison, Smartrac and Arizon accounted for 22%, 17%, and 10% of our total revenue, respectively. This sales concentration to a relatively small number of tag OEMs lowers our bargaining power and increases the risk that our pricing or sales could decline quickly based on aggressive pricing or sales measures taken by our competitors or our own failure to compete effectively.

We sell our reader ICs and modules to reader OEMs and ODMs, and our readers and gateways to VARs and SIs, primarily through distribution. We are beginning to sell software through these same partners as well as through ISV partners. We have experienced in the past and may again experience in the future purchasing delays or disruptions by some of these channel partners due to conditions within their organizations that are independent of market demand for our products or the RAIN market generally.

Although our strategy is to diversify our partner base by pursuing increased orders from smaller partners, add new partners, and increase end-user demand for our products, we may not succeed in doing so. The number of tag OEMs may decrease by consolidation or otherwise. Even if we are successful in obtaining and retaining new partners, our small number of existing large tag OEMs may continue to account for a substantial portion of our future sales. Changes in markets, channel partners, end-user customers, products, negative economic or financial developments, or poor or limited credit availability may adversely affect the ability of our tag OEMs, reader and gateway partners and distributors to bring our products to market. If our reader IC or module OEMs are unable to obtain components for products in which our products are included, our product sales could be adversely affected.

Our future performance will depend, in part, on our ability to attract new tag OEMs, reader and gateway partners and distributors that use, market and support our products effectively, especially in market segments where we have not sold products previously. If we cannot retain our current tag manufacturers, reader and gateway partners and distributors or establish new relationships, our business, financial condition and operating results could be harmed. In addition, our competitors' strategic relationships with or acquisitions of these tag OEMs, reader and gateway partners or distributors could disrupt our relationships with them. Any such disruption could impair or delay our product sales to end users and increase our costs of distribution, which could adversely affect our sales or operating results.

***Our reliance on distributors, SIs, VARs and software solution providers to sell and distribute our products to end users could harm our business and revenue.***

We rely on our partner ecosystem to sell and distribute our products to end users. Our revenue depends on their ability to successfully market, sell, install and provide technical support for the solutions in which our products are integrated or to sell our products on a standalone basis. Our revenue will decline if our channel partners fail. Further, faulty or negligent implementation and installation of our products by systems integrators may harm our reputation.

Because we fulfill through channel partners, our ability to determine end-user demand is limited. End users drive demand for our products but because we are often at least one step removed from these end users, we may be unable to rectify damage to our reputation caused by our channel partners who have more direct contact with these end users. For strategic or other reasons, our channel partners may choose to prioritize the sale of our competitors' products over our products. Furthermore, some of our channel partners may offer some products that compete with our products and may limit sales of our competing products. If our distributors, SIs, VARs or software solution providers are unable to sell an adequate amount of our products in a given quarter or if they choose to decrease their inventories of our products for any reason, our sales to these channel partners and our revenue will decline.

Many of our channel partners provide us with customer referrals and cooperate with us in marketing our products; however, our relationships with them may end at any time. If we fail to successfully manage our relationships with our channel partners, our ability to sell our products into new industries and to increase our penetration into existing industries may be impaired and our business will be harmed.

***If our channel partners do not properly forecast end users' demand for our products then they may carry excess product inventory, which could adversely affect our revenue and operating results.***

If some or all of our channel partners purchase more of our products than they need to satisfy end-user demand in any particular period, inventories held by the channel partners will grow during that period. The channel partners are then likely to reduce future orders until they realign inventory levels with end-user demand, which could adversely affect our product revenue in a subsequent period.

Distributors may also return our products in exchange for other products, subject to time and quantity limitations. Our reserve estimates for products stocked by our distributors are based principally on reports provided to us by our distributors, typically on a monthly basis. To the extent this resale and channel-inventory information is inaccurate, or we do not receive it in a timely manner, we may not be able to make accurate reserve estimates for future periods, which could adversely affect our operating results.

***Our growth strategy depends in part on the success of strategic relationships with third parties and their continued performance and alignment.***

To continue our growth, we are investing in our relationships with SIs, VARs and software solution providers that have product offerings that complement our platform and through which we will fulfill sales. Our business will be harmed if we fail to successfully develop and implement such strategic relationships. For example, operating results may suffer if our efforts towards developing our go-to-market relationships consume resources and incur costs, but do not result in a commensurate increase in revenue. In addition, such relationships may involve exclusivity provisions, additional levels of distribution, discount pricing or investments in other companies. The cost of developing and maintaining such relationships may go unrecovered or unrewarded and our efforts may not generate a correspondingly significant increase in revenue.

***Selling prices of our products could decrease substantially, which could have a material adverse effect on our revenue and gross margins.***

Historically, our market has experienced price erosion. The average selling price, or ASPs, of our products has decreased as the RAIN market has developed. We may experience substantial fluctuations in future operating results due to further ASP reductions.

From time-to-time we reduce the selling prices of our products to meet end-customer demands or to respond to market pressure from our competition. For example, during the second half of 2017, competitive pressures led to larger ASP declines for our endpoint ICs than we saw in previous quarters. As the market has grown, we have generally seen competitive pressures increase. We also sometimes reduce prices to encourage adoption, address macroeconomic conditions or for other reasons. We expect to do so again in the future. If we are unable to offset ASP reductions with increased sales volumes or reduced product costs then our revenue and gross margins will suffer. Further, our customers may be slow to migrate to new, higher margin products. Some competitors have significantly greater resources than we have and may be better able to absorb the negative impact on operating results as a result of such trends.

Rapid market innovation, which we continue to experience, can drive intense pricing pressure, particularly for older products or products using older technology. Short product life cycles cause our channel partners and end

users to replace older products with newer ones on a regular basis. When demand for older products declines, ASPs may drop, in some cases precipitously. To profitably sell our products we must continually improve our technology, and processes, and reduce costs in line with the lower selling prices. If we and our third-party suppliers and manufacturers cannot advance process technologies or improve efficiencies to a degree sufficient to maintain required margins, we may not be able to sell our products profitably. Should our cost reductions fail to keep pace with reductions in market prices, our business, financial condition and operating results will be materially adversely affected.

***Changes in our product mix could cause our overall gross margin to decline, adversely affecting our operating results and financial condition.***

We may not be able to maintain our historical gross margins. Our gross margins depend strongly on product mix. A shift in sales mix away from our higher margin products to lower margin products will adversely affect our gross margins. We generate a majority of our revenue from sales of our endpoint ICs, which have lower gross margins than our other products, and endpoint IC revenue may increase as a percentage of our total revenue over time. In addition, gross margins can be affected by endpoint IC product mix. As the market for our newer, higher-margin endpoint IC products matures, we expect to experience price erosion for those products which may adversely affect gross margins if we are not able to realize cost reductions or shift towards newer or other higher-margin products. If endpoint IC revenue continues to grow relative to our other products, our company-wide gross margin will decline. Additionally, competitive alternatives to our products, overall increased competition, weaker than expected demand, currency exchange rates and other factors may lead to lower prices, revenue and margins in the future, adversely affecting our operating results and financial condition.

***We generate most of our revenue from our endpoint ICs, and a decline in sales of these products or increased price competition in the market for endpoint ICs could adversely affect our operating results and financial condition.***

We derive, and expect to continue to derive, a majority of our product revenue from our endpoint ICs. Accordingly, we are vulnerable to fluctuations in demand for our endpoint ICs, and if demand for them declines, our business and operating results will be adversely affected. In addition, the continued adoption of our endpoint ICs and maintaining demand for them and our new endpoint IC products, derives in part from our ability to continually innovate and to demonstrate the benefits of using our endpoint ICs with our reader ICs and modules, readers and gateways to achieve superior performance over our competitors. If we are not successful in establishing the benefits of using our products and platform, we may not be successful in countering competitive pressures to lower prices for our endpoint ICs and our business and operating results could be adversely affected.

***Our products must meet exacting technical and quality specifications. Defects, errors or interoperability issues with our products, the failure of our products to operate as expected, or undue difficulty in deploying our products in actual operations could affect our reputation, result in significant costs to us and impair our ability to sell our products.***

Our products may contain defects or errors or may not operate as we or our channel partners or end-user customers expect, which could materially and adversely affect our reputation, result in significant costs to us and impair our ability to sell our products in the future. Our products must meet demanding specifications for quality, performance and reliability. Our products are highly technical and designed to be deployed in large, complex systems under a variety of conditions. Channel partners and end users may discover errors, defects or incompatibilities only after deploying our products. For example, harsh environments or radio-frequency interference may negatively affect gateway performance. In addition, our channel partners or end users may experience compatibility or interoperability issues between our products and their enterprise software systems or networks, or between our products and other RAIN products they may use.

We may experience quality problems with our products combined with or incorporated into products from other vendors, such as tags produced by our tag OEMs using our endpoint ICs, or readers or gateways assembled by OEMs and ODMs using our reader ICs or modules. We may have difficulty identifying and correcting the source of problems when third parties are combining, incorporating or assembling our products.

If we are unable to fix errors or other problems, we could experience:

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- loss of customers or customer orders;
- lost or delayed market acceptance and sales of our products;
- loss of market share;
- damage to our brand and reputation;
- impaired ability to attract new customers or achieve market acceptance;
- diversion of development resources;
- increased service and warranty costs;
- replacement costs;
- legal actions by our customers; and
- increased insurance costs.

Given the technical and business requirements against which end users evaluate RAIN and our products and platform, our business results and prospects could suffer if we are unable to make our products and our platform easy to deploy. To demonstrate the benefits of our platform, or layers of it, in fulfilling business needs and to develop deployment methods to meet those needs, we frequently enter into proof-of-concept deployments, or POCs, with prospective end users. These POCs can extend for relatively long periods of time, and their ultimate outcome can be mixed for a variety of reasons, including changes in end-user business requirements, changes in end-user commitment to the POC as well as deployment challenges. If we fail to deliver deployable solutions through POCs or otherwise, adoption of our products and platform could be adversely affected and our reputation and our business prospects could suffer.

Although our agreements typically contain provisions that purport to limit our liability for damages resulting from defects in our products, such limitations and disclaimers may not be enforceable or otherwise effectively protect us from claims. We may be required to indemnify our customers against liabilities arising from defects in our products or in their solutions that incorporate our products. These liabilities may also include costs incurred by our channel partners or end users to correct problems or replace our products.

The costs we incur correcting product defects or errors may be substantial and could adversely affect our operating results. Although we test our products for defects or errors prior to product release and during production, our customers still occasionally catch defects or errors that we miss. Such defects or errors have occurred in the past and may occur in the future. To the extent product failures are material, they could adversely affect our business, operating results, customer relationships, reputation and prospects. Also, we assert that our products conform to the UHF Gen2 protocol. Compatibility issues between our products and the protocol, or among different products that each nominally conform to the protocol, could disrupt our customers' operations, hurt our customer relations and materially adversely affect our business and prospects.

***We will lose market share and may not be successful if end users or customers do not design our products into their products and systems.***

End users often undertake extensive pilot programs or qualification processes prior to placing orders for large quantities of our products, in particular for reader and gateway products, because these products must function as part of a larger system or network or meet certain other specifications. We spend significant time and resources to have our products selected by a potential end user or customer, which is known as a "design-in." In the case of reader and gateway products, a "design-in" means the product has been selected to be designed into the end user's system and, in the case of an endpoint IC, may mean the endpoint IC has met certain unique performance criteria established by the end user or customer. If we fail to develop new products that adequately or competitively address the needs of potential end users, they may not select our products to be designed into their systems, which could adversely affect our business, prospects and operating results.

***Our business is dependent upon our brand recognition and reputation, and if we fail to maintain or enhance our brand recognition or reputation, our business could be harmed.***

We believe that maintaining and enhancing our brand and our reputation is critical to our relationships with our customers and end users and to our ability to attract new customers and end users. We also believe that our brand and reputation will be increasingly important as competition in our market continues to develop. Our success in this area will depend on a wide range of factors, some of which are beyond our control, including the following:

- the efficacy of our marketing efforts;

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- our ability to continue to offer high-quality, innovative and defect-free products;
- our ability to maintain the security and privacy of our customers' sensitive and proprietary information;
- our ability to retain existing customers and obtain new customers;
- our ability to maintain high customer satisfaction;
- the quality and perceived value of our products;
- our ability to successfully differentiate our products from those of our competitors;
- actions of competitors and other third parties; and
- positive or negative publicity.

If our brand promotion activities are not successful, our operating results and growth may be harmed.

Furthermore, negative publicity, whether or not justified, relating to events or activities attributed to us, employees, channel partners or others associated with any of these parties, may tarnish our reputation and reduce the value of our brand. Damage to our reputation and loss of brand equity may reduce demand for our products and platform and have an adverse effect on our business, operating results and financial condition. Moreover, any attempts to rebuild our reputation and restore the value of our brands may be costly and time consuming, and such efforts may not ultimately be successful.

### ***If we are unable to protect our intellectual property, our business could be adversely affected.***

Our success depends in part upon our ability to obtain, maintain and enforce patents, copyrights, trade secrets, trademarks and other intellectual property rights and to prevent third parties from infringing, misappropriating or circumventing the rights we own or license. Given our industry-leading innovation in RAIN technology, there is a high likelihood that material elements of our products, including our endpoint ICs have been or will be copied by competitors. We take appropriate and feasible measures to protect our intellectual property rights. However, we cannot be sure that we will be able to prevent such conduct by simply enforcing, or threatening to enforce, those rights, particularly against competitors who may have more financial and other resources to deploy against us.

We rely on a variety of intellectual property rights, including patents in the United States and copyrights, trademarks and trade secrets in the United States and foreign countries. Because many RAIN products are used in or imported into the United States, we have historically focused on filing U.S. patent applications. We have filed a small number of foreign patent applications, but the number of issued and allowed foreign patents is still small. By seeking patent protection primarily in the United States, our ability to assert our intellectual property rights outside the United States is limited. We have registered trademarks and domain names in selected foreign countries where we believe filing for such protection is appropriate. Regardless, some of our products and technologies may not be covered adequately by any patent, patent application, trademark, copyright, trade secret or domain name.

We cannot guarantee that:

- any of the patents, trademarks, copyrights, trade secrets or other intellectual property rights we presently employ in our business will not lapse or be invalidated, circumvented, challenged or abandoned;
- our intellectual property rights will provide competitive advantages to us;
- our ability to assert our intellectual property rights against potential competitors or to settle current or future disputes will not be limited by our agreements with third parties;
- any of our pending or future patent applications will be issued or have the coverage we originally sought;
- our intellectual property rights will be enforced, particularly in jurisdictions where competition may be intense or where legal protections may be weak;
- we will not lose the ability to assert our intellectual property rights against, or to license our technology to, others and collect royalties or other payments; or
- we will retain the right to ask for a royalty-bearing license in relation to ratification of a standard for which we participate in the standards process if we fail to file an intellectual property declaration pursuant to such standards process.

In addition, our competitors or others may design around our patents or protected technologies. Effective intellectual property protection may be unavailable or more limited in one or more relevant jurisdictions relative to those protections available in the United States. If we pursue litigation to assert our intellectual property rights, an adverse decision in any legal action could limit our ability to assert our intellectual property rights, limit the value of our technology or otherwise negatively impact our business, financial condition and operating results.

Monitoring unauthorized use of our intellectual property is difficult and costly. Unauthorized use of our intellectual property may have already occurred or may occur in the future. Our failure to identify unauthorized use or otherwise adequately protect our intellectual property could adversely affect our business.

Moreover, any actual or threatened litigation to enforce our intellectual property could be time consuming, distracting, expensive and could result in outcomes or trigger consequences that are harmful to us. We could incur significant costs and divert our attention and the efforts of our employees by threatening or initiating litigation. This could, in turn, result in lower revenue and higher expenses. To the extent we discuss our concerns regarding possible or actual infringement with others prior to or in lieu of litigation, we could also become subject to claims brought by alleged infringers. Because litigation outcomes are uncertain, we could lose in our enforcement action or weaken our intellectual property through the litigation process. At the same time, any decision not to enforce our intellectual property-rights through litigation could embolden others to violate or potentially violate our intellectual property rights, and thus weaken them over time.

Some of our know-how or technology is not patented or patentable and may constitute trade secrets. To protect our trade secrets, we have a policy of requiring our employees, consultants, advisors and other collaborators to enter into confidentiality agreements. We also rely on customary contractual protections with our channel partners, suppliers and end users, and we implement security measures intended to protect our trade secrets, know-how or other proprietary information. However, we cannot guarantee we have entered into appropriate agreements with all parties that have had access to our trade secrets, know-how or other proprietary information. Moreover, the agreements we have entered into may not provide meaningful protection for our trade secrets, know-how or other proprietary information in the event of any unauthorized use or disclosure. Our trade secrets, know-how or other proprietary information could be obtained by third parties as a result of breaches of our physical or electronic security systems or our suppliers, employees or consultants could assert rights to our intellectual property.

Finally, our use of overseas manufacturers may involve particular risks. The intellectual property protection in countries where our third-party contractors operate is weaker than in the United States. If the steps we have taken and the protection provided by law do not adequately safeguard our intellectual property rights then we could suffer losses in profits due to the sales of competing products that exploit our intellectual property rights.

***We may assert or face claims of intellectual property infringement which could be time consuming, costly to prosecute, defend or settle, result in the loss of significant rights, and adversely affect RAIN adoption generally.***

Many companies in our industry, as well as so-called non-practicing entities, hold large numbers of patents and other intellectual property rights and may vigorously pursue, protect and enforce their intellectual property rights. We have in the past, and may in the future, receive invitations to license patent and other intellectual property rights to technologies that are important to our business. We may also receive assertions against us, our channel partners or end users claiming that we or they infringe patent or other intellectual property rights. Claims that our products, processes, technology or other aspects of our business infringe third-party intellectual property rights, regardless of their merit or resolution, could be costly to defend or settle and could divert the efforts and attention of our management and technical personnel. If we decline to accept an offer, the offering party may allege that we infringe such patents, which could result in litigation.

Intellectual property disputes affecting our industry may adversely affect RAIN adoption. For example, in 2011 Round Rock Research filed lawsuits against 11 end users, including Walmart and Macy's, for patent infringement in the RAIN products these retailers use. We believe these lawsuits materially and adversely affected demand for our products by retailers and others from 2011 to 2014. In 2013, Round Rock Research entered into licensing settlement agreements with a substantial number of RAIN vendors, including us; in early 2015, they reached a settlement agreement with the last of the end-user defendants. We, our channel partners, suppliers or end users could be involved in similar disputes in the future which would materially and adversely affect our operating results and growth prospects. We may also be forced, or choose, to take action to protect our own intellectual property against infringement by others. This too could materially and adversely affect RAIN adoption as well as our own operating and growth prospects.



Many of our agreements require us to indemnify and defend our channel partners and end users from third-party infringement claims and pay damages in the case of adverse rulings. These damages could be sizable and disproportionate to the business derived from the accused channel partners or end users. Moreover, we may not know whether we are infringing a third party's rights due to the large number of RAIN-related patents or to other systemic factors. For example, patent applications in the United States are maintained in confidence for up to 18 months after filing or, in some instances, for the entire time prior to patent issuance. Consequently, we may not be able to account for such rights until after publication. Competitors may also have filed patent applications or received patents and may obtain additional patents and proprietary rights that block or compete with our patents. Claims of this sort could harm our relationships with our channel partners or end users and might deter future customers from doing business with us. We do not know whether we will prevail in any such future proceedings given the complex technical issues and inherent uncertainties in intellectual property litigation. If any pending or future proceedings result in an adverse outcome, then we could be required to:

- cease the manufacture, use or sale of the infringing products, processes or technology;
- pay substantial damages for infringement;
- expend significant resources to develop non-infringing products, processes or technology;
- license technology from the party claiming infringement, which license may not be available on commercially reasonable terms, or at all;
- cross-license our technology to a competitor to resolve an infringement claim, which could weaken our ability to compete with that competitor; or
- pay substantial damages to our channel partners or end users to cause them to discontinue their use of, or replace, infringing products with non-infringing products.

Any of the foregoing results could have a material adverse effect on our business, financial condition and operating results.

***We have limited visibility into the length of the sales and deployment cycles for our products.***

Because we have limited sales history for our products, we have limited visibility into the lengths of the product sales and deployment cycles, and from time-to-time these cycles have been longer than we anticipated. For new types of products, such as our gateways and ItemSense software, our visibility into the sales and deployment cycle lengths is even more limited; inasmuch as these products are components in a systems sale, our experience in the systems-selling cycle is even more limited. Numerous factors can contribute to uncertainties in the cycle lengths, including the time channel partners and end users spend evaluating our products, our time educating them on the products' benefits, and our time integrating our systems with their systems. The length and uncertain timing of the sales and deployment cycles can lead to delayed product orders. In anticipation of product orders, we may incur substantial costs before the sales cycle is complete and before we receive any customer orders or payments. If a sale is not completed or is cancelled or delayed, we may incur substantial expenses, which could hinder our ability to achieve or maintain profitability or otherwise negatively affect our financial results.

***Significant developments stemming from the current U.S. presidential administration's priorities or initiatives, or the U.K.'s referendum on membership in the EU could have a material adverse effect on us.***

The current U.S. presidential administration has pursued trade policy that is starkly different from past administrations. Its actions have included, withdrawing the United States from negotiations for the TPP; renegotiating NAFTA; announcing and imposing tariffs on a wide variety of trading partners including, as of the date of this report, tariffs on up to \$200 billion of goods imported into the United States from China; proposing restrictions on free trade generally and immigration to the United States. Changes in U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories and countries where we currently develop and sell products, and immigration to the United States, and any negative sentiments towards the United States as a result of such changes, including our trading partners potentially imposing tariffs on imports of our products, could materially affect our business. In addition, negative sentiments towards the United States among non-U.S. customers and among non-U.S. employees or prospective employees, or the imposition of restrictions on immigration to the United States, could adversely affect sales or hiring and retention, respectively. To the extent U.S. policies engender an economic downturn, in the United States or abroad, the effects could materially affect our business, in many ways only some of which we can identify as of the date of this report.



In August 2018, the United States imposed tariffs on products manufactured in China. This tariff affects certain pre-Monza R6 endpoint IC w afer SKUs that our inlay partners import into, and process in, the United States. If we are unable to work with our supply chain and sourcing options to implement a long-term strategy for mitigating the impact of tariffs on imports, or if we are unable to migrate customers to our Monza R6 endpoint ICs in a timely manner, our business could be adversely impacted.

In June 2016, the United Kingdom held a referendum and voted in favor of leaving the European Union, or EU, and in March 2017 the United Kingdom began the official process to leave the EU by April 2019 based on a two-year schedule. This action has created political and economic uncertainty, particularly in the United Kingdom and the EU, and this uncertainty may last for years. Our business in the United Kingdom, the EU and worldwide could be affected during this period of uncertainty, and perhaps longer, by the impact of the United Kingdom's decision to leave the EU. There are many ways in which our business could be affected, only some of which we can identify as of the date of this report.

The withdrawal of the United Kingdom from the EU, along with events that could occur in the future as a consequence of the United Kingdom's withdrawal, including the possible breakup of the United Kingdom, may cause significant volatility in global financial markets, including in global currency and debt markets. This volatility could cause a slowdown in economic activity in the United Kingdom, Europe or globally, which could adversely affect our operating results and growth prospects. In addition, our business could be negatively affected by new trade agreements between the United Kingdom and other countries, including the United States, and by the possible imposition of trade or other regulatory barriers in the United Kingdom. Furthermore, we currently operate in Europe through an Impinj subsidiary based in the United Kingdom, which currently provides us with certain operational, tax and other benefits. The United Kingdom's withdrawal from the EU could adversely affect our ability to realize those benefits and we may incur costs and suffer disruptions in our European operations as a result. These possible negative impacts, and others resulting from the United Kingdom's withdrawal from the EU, may adversely affect our operating results and growth prospects.

***We are subject to order and shipment uncertainties. Inaccuracies in our estimates of end-customer or channel-partner demand and product mix, or unexpected external events, could negatively affect our inventory levels, sales and operating results.***

Our ability to accurately plan purchases or manufacturing is limited because lead times for our products can be lengthy and our ability to accurately forecast near-term demand for our products is limited, potentially causing us to have either excess or inadequate inventory, to lose sales, or to reduce our profit margins. High inventory levels and potential obsolescence could result in unexpected expenses or increases in reserves that could adversely affect our business, operating results and financial condition. Low inventory levels could cause us to lose sales, market share or damage our customer relationships.

We sell our products primarily through channel partners, and we derive revenue primarily from purchase orders rather than from long-term purchase commitments. To ensure product availability, we typically manufacture from channel-partner forecasts in advance of received purchase orders. However, many of our channel partners have difficulty accurately forecasting end-user demand for our products and the timing of that demand. In addition, when we release new products, we may carry higher inventories or have slower inventory turnover depending on our ability to anticipate market acceptance.

Additional uncertainty arises from competitive business practices and from external events. Our channel partners can cancel purchase orders or defer product shipments, in some cases with little or no advance notice to us. Additionally, we sometimes receive soft commitments for larger order sizes which do not materialize. Moreover, external events such as changes in regulatory standards or the timing of such changes can adversely affect demand and consequently our inventory levels, sales and operating results.

***We are subject to risks inherent in foreign operations, including social, political and economic flux and compliance with additional U.S. and international laws, including those related to anti-bribery and anti-corruption, and may not be able to successfully maintain or expand our international operations.***

In 2018, 76% of our total revenue was derived from sales outside the United States. We anticipate growing our business, in part, by continuing to expand our international operations, which involves a variety of risks, including:

- changes, some unexpected or unanticipated, in regulatory requirements, taxes, trade laws, tariffs, export quotas, custom duties or other trade restrictions;
- lack of established, clear, or fairly implemented standards or regulations with which our products must comply;
- greater difficulty in enforcing contracts, judgments and arbitration awards in international courts, and in collecting accounts receivable and longer payment and collection periods;
- difficulty in supporting and localizing our international products;
- different or unique competitive pressures as a result of, among other things, the presence of, or preference for, local businesses and market players;
- challenges in managing employees, some foreign nationals, over large geographic distances, including the need to implement appropriate systems, policies, benefits and compliance programs;
- challenges in doing business in different languages and in business cultures with varying norms of transparency and compliance with policies than in the United States;
- limited or unfavorable intellectual property protection;
- misappropriation of our intellectual property;
- inflation and fluctuations in foreign currency exchange rates and interest rates;
- withholding taxes or other taxes, or changes thereof, on our foreign income;
- restrictions, or changes thereof, on foreign trade or investment, including currency-exchange controls;
- changes in a country's or region's political, regulatory, legal or economic conditions;
- political uncertainty, strife, unrest, or conflict;
- differing regulations with regard to maintaining operations, products and public information;
- inequities or difficulties obtaining or maintaining export and import licenses;
- differing labor regulations, including where labor laws may be more advantageous to employees than in the United States
- restrictions on earnings repatriation;
- corrupt or unethical practices in foreign jurisdictions that may subject us to exposure under applicable anti-corruption and anti-bribery laws such as the Foreign Corrupt Practices Act and the United Kingdom Bribery Act of 2010, or U.K. Bribery Act; and
- regulations, and changes thereof, relating to data privacy and the unauthorized use of, or access to, commercial and personal information, particularly in Europe.

Various foreign regulatory or other governmental bodies may issue rulings that invalidate prior laws, regulations, or legal frameworks in manners that may adversely impact our business. The Court of Justice of the European Union in October 2015 issued a ruling immediately invalidating the EU-U.S. Safe Harbor Framework, which facilitated personal data transfers to the United States in compliance with applicable EU data protection laws. EU and U.S. political authorities adopted the EU-U.S. Privacy Shield on July 12, 2016, providing a mechanism for companies to transfer EU personal data to the United States. It is unclear as of the date of this report whether we will make use of the EU-U.S. Privacy Shield, and it has been subject to challenges in EU courts. In view of these developments, there is significant regulatory uncertainty surrounding the future of data transfers from the European Economic Area to the United States. In addition, the European Commission adopted the General Data Protection Regulation, or GDPR, which became effective on May 25, 2018. The GDPR imposes more stringent data-protection requirements than the former regulatory regime in the EU and provides for greater penalties for noncompliance. Additionally, the United Kingdom enacted the Data Protection Act 2018 in May 2018 that substantially implements GDPR, but as of the date of this report, it remains uncertain how data protection laws or regulations will develop in the United Kingdom in the medium to longer term and how data transfers to and from the United Kingdom will be regulated.

We opened an office in Shanghai, China in 2011. In addition to the risks listed above, we are also exposed to risks associated with changes in laws and policies governing Chinese operations and, to a lesser extent, changes in U.S. laws and regulations relating to foreign trade and investment. To date, legal, policy or regulatory changes have not had a material adverse effect on our business or financial condition, but they may not in the future. We may experience increased costs for, or significant impact to, our Chinese operations in the event of changes in Chinese government policies or political unrest or unstable economic conditions in China. The nationalization or other expropriation of private enterprises by the Chinese government could result in total loss of our China investment. Any of these matters could materially and adversely affect our business and results of operations.

Failure to comply with anti-corruption and anti-bribery laws in our foreign activities could subject us to penalties and other adverse consequences. Anti-corruption and anti-bribery laws generally prohibit companies and their employees and intermediaries from making payments to foreign officials for the purpose of obtaining or keeping business, securing an advantage or directing business to another person, and require companies to maintain accurate books and records and a system of internal accounting controls. Under the U.S. Foreign Corrupt Practices Act of 1977, as amended, or the FCPA, U.S. companies may be held liable for corrupt actions taken by directors, officers, employees, agents, or other strategic or local partners or representatives. If we, our intermediaries or our solution providers, SIs, OEMs, VARs, distributors, tag manufacturers, and other channel partners fail to comply with FCPA requirements or similar legislation, government authorities in the United States and elsewhere could seek to impose civil or criminal fines and penalties which could have a material adverse effect on our business, operating results and financial conditions. Moreover, China is an area of heightened exposure regarding compliance with anticorruption laws such as the FCPA and the U.K. Bribery Act. We intend to increase our international sales and business there and, as such, our risk of violating laws such as the FCPA or U.K. Bribery Act also increases.

We have limited experience marketing, selling and supporting our products and services abroad and may not be able to increase or maintain international market demand for our products. In addition, regulations or standards adopted by other countries may require us to redesign existing products or develop new products for those countries. For example, foreign governments may impose regulations or standards with which our current products do not comply or may require operation in frequency bands in which our products do not operate. Furthermore, if we are unable to expand international operations in a timely and cost-effective manner in response to increased demand, we could miss sales opportunities and our revenue may decline, adversely affecting our operating results, business and prospects. If we invest substantial time and resources but are unable to expand our international operations successfully and in a timely manner, our business, prospects and operating results will suffer.

We generally conduct our China operations through a wholly owned subsidiary and our European operations through our U.K. subsidiary. We generally report our taxable income in worldwide jurisdictions based on our business operations in those jurisdictions. The relevant taxing authorities may disagree with our determinations as to the income and expenses attributable to the jurisdiction or subsidiary. In the event of a disagreement, if our position was not sustained, we could be required to pay additional taxes, interest and penalties, which could result in tax charges, higher effective tax rates, reduced cash flows and lower overall profitability.

***We are subject to governmental export and import controls that could subject us to liability or impair our ability to compete in international markets.***

The U.S. and various foreign governments have imposed controls, export license requirements and restrictions on the import or export of certain products, technologies and software. We must export our products in compliance with U.S. export controls, including the Commerce Department's Export Administration Regulations and various economic and trade sanctions established by the Treasury Department's Office of Foreign Assets Controls. We may not always be successful in obtaining necessary export licenses, and our failure to obtain required import or export approval for our products or limitations on our ability to export or sell our products imposed by these laws may harm our international and domestic sales and adversely affect our revenue. Noncompliance with these laws could have negative consequences, including government investigations, penalties and reputational harm.

Changes in our products or changes in export, import and economic sanctions laws and regulations may delay our introduction of new products in international markets, prevent our customers from deploying our products internationally or, in some cases, prevent the export or import of our products to or from certain countries altogether. While we are not aware of any current or proposed export or import regulations that will materially restrict our ability to sell our products, any change in export or import regulations or legislation, shift or change in enforcement, or change in the countries, persons or technologies targeted by these regulations, could result in decreased use of our products by, or in our decreased ability to export or sell our products to, existing or potential customers with international operations. In such event, our business and results of operations could be adversely affected.

***Instability or deterioration in the political, social, business or economic conditions in key production jurisdictions could harm our business, financial condition and operating results.***

We outsource manufacturing and production of our hardware products to suppliers in a limited number of jurisdictions, some of which experience significant and abrupt political, social, business or economic change. These jurisdictions include Thailand, Malaysia, Taiwan and China, which have experienced significant change in political, social, business or economic conditions in the past and may experience them in the future.

For example, we post-process many of our IC wafers, including testing, dicing and other wafer operations, using subcontractors in Bangkok, Thailand. Thailand has experienced ongoing political and social upheaval over the past two decades. In May 2014, the Royal Thai Army staged a military coup, banned demonstrations and enforced monitoring of civilian activities. In August 2014, Thailand's national assembly appointed the coup leader as prime minister and in August 2016, Thai voters adopted via referendum a new constitution drafted by Thailand's interim government. In October 2016, Thailand's king died after a 70-year reign and was succeeded by his son, but political instability persists.

Deterioration in the political, social, business and economic conditions in any jurisdictions in which we have significant suppliers could slow or halt product shipments or disrupt our ability to test or post-process products. In such an eventuality, we could be forced to transfer our manufacturing, testing and post-processing activities to more stable, and potentially more costly regions or find alternative sources, which could harm our business, financial condition and operating results.

***Intellectual property licensing from or to others, including competitors, may subject us to requirements or limitations that could adversely affect our business and prospects.***

We have intellectual property license agreements that give us access to certain patents and intellectual property of others. We have not licensed our patents or intellectual property to others except as necessary for our customers to practice their business using our products and as required pursuant to agreements that we have entered into in connection with our participation in the development of GS1 EPCglobal protocols and ISO standards. In the course of our participation in the development of GS1 EPCglobal protocols, including UHF Gen2, UHF Gen2 V2, tag data standards, low-level reader protocol, and others, we have agreed to license on a royalty-free basis those of our patents that are necessarily infringed by the practice of these protocols to other GS1 EPCglobal members, subject to reciprocal royalty-free rights from those other members. Because it may not be clear whether a member's intellectual property is necessary or optional to the practice of a protocol, disputes could arise among members, resulting in our inability to receive a license on royalty-free terms. Further, some GS1 EPCglobal members declined to provide licenses to some of their intellectual property under royalty-free terms, instead choosing reasonable and nondiscriminatory, or RAND, terms. Disputes or confusion may arise about whether we may invoke our necessary intellectual property if these members choose to assert their RAND intellectual property, potentially causing or at least complicating any ensuing litigation and harming our business, financial condition and operating results.

In the course of our participation in the development of certain ISO standards we have agreed to grant to all users worldwide a license to those of our patents that are necessarily infringed by the practice of those standards, including at frequencies other than UHF, on RAND terms, again subject to reciprocity. As a result, we are not always able to limit to whom and, to a certain extent, on what terms we license our technologies, and our control over and our ability to generate licensing revenue from some of our technologies may be limited. We may choose to license our patents or intellectual property to others in the future. We cannot guarantee that any patents and technology that we provide in such future licenses will not be used to compete against us.

***We rely on third-party license agreements; impairment of those agreements may cause production or shipment delays that could harm our business.***

We have licensing agreements with other entities for patents, software and technology used in our manufacturing operations and products. For example, we license tools from design-automation software vendors to design our silicon products. Third-party licenses for patents, software and other technology important to our business may not continue to be available on commercially reasonable terms, if at all. Loss of any such licenses could cause significant manufacturing interruptions, delays or reductions in product shipments until we can develop, license, integrate, and deploy alternative technologies, if even possible, which would materially harm our business and operating results.

***Our use of open-source software may expose us to additional risks and harm our intellectual property.***

Our products, processes and technology sometimes use or incorporate software that is subject to an open-source license. Open-source software is typically freely accessible, usable and modifiable, and is made available to the general public on an “as-is” basis under the terms of a nonnegotiable license. Use and distribution of open-source software may entail greater risks than use of third-party commercial software. Certain open-source software licenses require a user who intends to distribute the open-source software as a component of the user’s software to disclose publicly part or all of the user’s source code. In addition, certain open-source software licenses require the user of such software to make derivative works of the open-source code available to others at low or no cost. Consequently, open-source licensing can subject our previously proprietary software to open-source licensing terms, which could enable our competitors to create similar offerings with lower development effort and time and ultimately could result in a loss of sales. In addition, open-source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of their code, opening us to business risks that could materially harm our operating results.

We may face claims alleging noncompliance with open-source license terms or infringement or misappropriation of proprietary software. These claims could result in litigation, require us to purchase a costly license, or require us to devote research and development resources to change our software, any of which would have a negative effect on our business and operating results. Few courts have interpreted open-source licenses, and these licenses could be construed in a way that could impose unanticipated conditions or restrictions on our ability to commercialize our offerings. In addition, if there are changes in the licensing terms for the open-source software we use, we may be forced to re-engineer our solutions, incur additional costs or discontinue sale of our offerings. We cannot guarantee that we have incorporated all open-source software in our software in a manner that is consistent with our current policies and procedures, or in a manner that will not subject us to liability.

***Privacy and security concerns relating to RAIN could damage our reputation and deter current or potential customers from using our products.***

Privacy advocates and others have raised and may continue raising concerns about RAIN compromising consumer privacy or facilitating theft. These concerns include unauthorized parties collecting personally identifiable information, tracking consumers, stealing identities or causing other privacy-related issues. Consumers may be subject to unauthorized readers or gateways surreptitiously identifying and tracking their RAIN tags to gain information a consumer considers private, even if the consumer employs protective measures. Retailers may inadvertently or perhaps even intentionally read consumers’ tags to gain information, such as shopping behavior, that may be illegal to collect, or if not illegal, may be considered intrusive by consumers. Unauthorized readers or gateways could gain access to sensitive information stored in tags despite measures designed to thwart such unauthorized access. For example, criminals seeking to divert or steal high-value pharmaceutical products could seek to identify these products by looking for tags with Electronic Product Codes, or EPCs, corresponding to these products. If such concerns increase, or if actual malicious or inadvertent breaches of privacy or theft occur, then our reputation could be damaged, our business and prospects may suffer, and we could incur significant liability.

In addition to concerns over privacy or theft, it may be possible for those with malicious intent to misuse RAIN in ways that actually facilitate theft or damage the public trust, such as by changing the EPC on a narcotic to misrepresent it as an over-the-counter product. It may even be possible to embed computer viruses or other malicious code into endpoint ICs so that by reading endpoint IC memory, the malicious code can be inserted into end-user systems. If a breach occurs, our customers could be the target of regulatory actions or private lawsuits. In such cases, a customer might allege that our products did not function as promised and may sue us for breach of contract, breach of warranty, negligence or another cause of action. Additionally, if our customers’ security measures are breached, even if through means beyond our control, our reputation may be damaged, we may be subject to litigation and our business and prospects could suffer. Moreover, concerns about security and privacy risks, even if unfounded, could damage our reputation and operating results and could delay the development of the overall RAIN industry. Security breaches could expose us to litigation and possible liability. Even if our products meet new standards or regulations, if our security measures are breached as a result of third-party action, our error or criminal act or otherwise, and, as a result, someone obtains unauthorized access to customer or end-user data, our reputation could be damaged, our business and prospects may suffer, and we could incur significant liability.

***Government regulations and guidelines relating to consumer privacy may adversely impact adoption of our products, require us to make design changes or constrain our ability to implement new and desired product features.***

Our customers are subject to laws and regulations related to collecting, storing, transmitting and using personal information, as well as additional laws and regulations that address privacy and security issues related to radiofrequency identification, or RFID. For example, some U.S. states have enacted statutes specifically governing the use of RFID, including prohibitions on mandatory implantation of an RFID IC, unauthorized skimming of information from ID cards and documents, unauthorized personnel tracking using RFID and improper use of RFID tags in drivers' licenses or on vehicles. Because RAIN uses RFID technology, we believe these statutes and regulations apply to RAIN systems.

The European Commission, or EC, has issued guidance to address privacy concerns about RFID. In May 2009, the EC issued a recommendation that retail companies in the EU inform their customers when RFID tags are either on or embedded within products. In April 2011, the EC signed a voluntary agreement with private and public stakeholders to develop privacy guidelines for companies using RFID in the EU. The agreement requires companies to conduct privacy impact assessments of new RFID applications and to take measures to address risks identified by the assessment before the RFID application is deployed. While compliance with the guidelines is voluntary, our customers that do business in the EU may have a preference for products that comply with the guidelines. If our RAIN products do not provide the necessary functionality to allow customers to comply with the guidelines, then our business may suffer.

The data security and privacy legislative and regulatory landscape in the United States and EU, and other foreign jurisdictions is evolving, and changes in laws and regulations may adversely impact our business, including our ability to develop future products. If we fail to develop products that implement end-user privacy requirements then end users may choose not to use our products in certain applications, which would harm our business, operating results and financial condition.

Although the Gen2 V2 protocol described below includes features for addressing consumer privacy and authenticating a tag, a third party may still breach these features, including as implemented in our products, in which case our reputation could be damaged, and our business and prospects may suffer.

***Alternative technologies or standards, or changes in existing technologies or standards, may adversely affect RAIN market growth.***

Technology developments may affect our business in ways we cannot anticipate. Breakthroughs in legacy RFID technologies or markets, including those using low frequency or high frequency technology, could adversely affect RAIN market growth generally and demand for our products in particular. For example, NFC technology, which today addresses a different market than RAIN, could, with breakthrough innovations, compete with RAIN in item tagging. Likewise, new technologies such as organic transistors may allow lower-cost ICs than our current silicon-based technology allows. These competing technologies could use intellectual property that is either not royalty free or to which we do not have access. If we are unable to innovate using new or enhanced technologies or processes or are slow to react to changes in existing technologies or in the market, or have difficulty competing with advances in new or legacy technologies, then our development of new or enhanced products could be materially impacted and potentially result in product obsolescence, decreased revenue and reduced market share.

To encourage widespread RAIN market adoption, we have participated in the development of industry standards, and we have designed our products to comply with these standards. In 2013, GS1 EPCglobal ratified “UHF Gen2 Version 2” or simply “Gen2 V2,” a new version of the protocol that underlies RAIN communications. In the future, we could lose our position in GS1 EPCglobal or we could lose our project-editorship role for Gen2. If one of our competitors introduces a Gen2 V2 product that gains market adoption before we do, we could lose market share and face difficulty selling our products. The introduction of new industry standards, or changes to existing industry standards, could make our products incompatible with the new or changed standards and could cause us to incur substantial development costs to adapt to these new or changed standards, particularly if they were to achieve, or be perceived as likely to achieve, greater penetration in the marketplace. If Gen2 V2 diverges significantly from our or the RAIN market’s needs then our products may likewise fail to keep pace with the market, our competitors’ products and end-user requirements, in which case end users could delay RAIN adoption. Moreover, the adoption or expected adoption of new or changed standards could slow the sale of our existing products before products based on the new or changed standards become available. New industry standards or changes to existing standards could also limit our ability to implement new features in our products if those features do not meet the new or changed standards. The lost opportunities as well as time and expense required for us to develop new products or change our existing products to comply with new or changed standards could be substantial, and we may not successfully develop products that comply with new or changed standards. If we are not successful in complying with any new or changed industry standards, then we could lose market share, causing our business to suffer.

We are a founding member of the RAIN Alliance. Our chief executive officer is presently an Alliance Director and was previously the Alliance Chairman. Board membership is an elected position that we could lose in future elections; and it provides industry stature and attendant benefits but is not without risk. If the RAIN market falters, or if the RAIN Alliance falters, then we could be blamed, our reputation and industry position could be impacted, and our business could suffer.

***Compliance with, and changes in, government spectrum regulations could adversely affect our ability to sell products and impair our operating results.***

Government radio regulations require that our readers and gateways be certified for spectral compliance in jurisdictions where they are sold or operated. Our readers and gateways are collectively certified for use in more than 40 countries worldwide, including the United States, Canada, Mexico, China, Japan, South Korea and every country in the EU. If one of our reader or gateway products is found to be noncompliant despite having such certification then we could be required to modify field-deployed readers or gateways to regain certification and could spend significant resources as well as miss sales opportunities in the process. Our revenue could decline, adversely affecting our operating results, financial condition, business and prospects. Additionally, government regulations may change, requiring us to redesign our products to conform with the new regulations or constraining our ability to implement new features into our products, thereby causing us to incur significant expenses, including expenses associated with obsolete inventory, or to forego opportunities to improve our products, potentially delaying our time-to-market and adversely affecting our operating results, financial condition, business and prospects.

***Our products may cannibalize revenue from each other, which could harm our business.***

Sales of some of our products enable our channel partners to develop their own products that compete with other of our products. For example, sales of our reader ICs allow technology companies to build and sell readers and gateways that compete with our products. Similarly, sales of our readers allow our channel partners to build and sell products that compete with our xPortal, xArray and xSpan. We even see cannibalization within our own product line—for example, our xSpan sometimes competes with our xPortal. In the future, we may see one product line expand at the expense of another, or we may be asked by channel partners to disadvantage or divest a product line. We cannot predict whether we can manage such conflicts in the future or retain channel partners despite conflicts. Any of the foregoing could have a material adverse effect on our business, financial condition and operating results.

***Acquisitions could result in operating difficulties, dilution and other harmful consequences.***

We have evaluated, and expect to continue evaluating, potential strategic transactions, and we may pursue one or more transactions, including acquisitions. We have limited experience executing acquisitions. Any transaction could be material to our financial condition and operating results. Integrating an acquired company, business or technology may create unforeseen operating difficulties and expenditures. Acquisition-related risks include:



- diverting management time and focus from operating our business to acquisition integration;
- difficulties integrating acquired products into our strategy and product plans;
- customers switching from us to new suppliers because of the acquisition;
- inability to retain employees from the business we acquire;
- challenges associated with integrating employees from the acquired company into our organization;
- difficulties integrating accounting, management information, human resource and other administrative systems to permit effective management of the business we acquire;
- potential requirements for remediating controls, procedures and policies appropriate for a public company in the acquired business that prior to the acquisition lacked these controls, procedures and policies;
- potential liability for past or present environmental, hazardous substance, or contamination concerns associated with the acquired business or its predecessors;
- possible write-offs or impairment charges resulting from the acquisition; and
- unanticipated or unknown liabilities relating to the acquired business.

Foreign acquisitions involve additional risks beyond those above, including risks related to integrating operations across different cultures and languages, currency risks and the economic, political and regulatory risks associated with other countries. Also, the anticipated benefit of any acquisition, domestic or foreign, may not materialize. Future acquisitions or dispositions could result in potentially dilutive issuances of our equity securities, debt incurrence, contingent liabilities or amortization expenses or goodwill write-offs, any of which could harm our financial condition. Future acquisitions may require us to obtain additional equity or debt financing, which may not be available on favorable terms or at all.

***Our business could be adversely affected if one or more members of our executive management team departed.***

Our success depends, in large part, on the continued contributions of our executive management team including Chris Diorio, Ph.D., our chief executive officer, and Eric Brodersen, our chief operating officer. None of our executive management team is bound by employment contracts to remain with us for a specified period of time. The loss of any member of our executive management team could harm our ability to implement our business strategy and respond to the rapidly changing market conditions in which we operate.

***If we are unable to attract, train and retain qualified personnel, especially technical, sales and marketing personnel, then we may not be able to effectively execute our business strategy.***

Our success depends on our ability to attract, motivate and retain qualified personnel. Our technical personnel, the source of our technical and product innovations, and our sales and marketing personnel that drive our go-to-market initiatives are especially important. There is no guarantee we can attract and retain such personnel as we continue to pursue our business strategy. The availability of, and competition for, qualified personnel in the Seattle area, where we are headquartered, constrains our ability to attract qualified personnel. The loss of the services of one or more of our key employees, or our inability to attract, retain and motivate qualified personnel could have a material adverse effect on our business, financial condition and operating results.

***Pricing and other provisions in our customer agreements could adversely affect our operating results.***

In the ordinary course of business, we enter into agreements containing pricing terms that could, in some instances, adversely affect our operating results and gross margins. For example, some contracts specify future reader, gateway or IC pricing, or contain most-favored customer pricing for certain products. Other agreements contain exclusivity terms that prevent us from pursuing certain business with other customers during the exclusivity period. Reducing prices or offering other favorable terms to one customer could adversely affect our ability to negotiate favorable terms with other customers. For competitive or strategic reasons, we may decide to enter into agreements containing these types of provisions, and this could impair our operating results.



***We and our suppliers are subject to environmental laws and regulations that could impose substantial costs on us and may adversely affect our business, operating results and financial condition.***

Some of our facilities, including those devoted to research and development, are regulated under federal, state, local, foreign and international environmental laws. Those laws govern pollutant discharge into air and water; managing, disposing, handling, labeling, and exposure to hazardous substances/wastes; and contaminated site cleanup. We could incur costs, fines and civil or criminal sanctions; third-party property damage or personal-injury claims; or could be required to pay substantial investigation or remediation costs if we were to violate or become liable under environmental laws. Liability under certain environmental laws can be joint and several and without regard to comparative fault. In addition, some of our products contain hazardous substances and are subject to requirements that regulate their content, such as the EU's Restriction of Hazardous Substances Directive and analogous regulations elsewhere. Although we design our products to be compliant with environmental regulations and require our third-party contractors to comply, we cannot guarantee that we or our products will always comply with these requirements. Environmental laws also tend to become more stringent over time, and we cannot predict the ultimate costs under environmental laws or the timing of these costs. Failure to comply with these and other environmental laws could result in fines, penalties and decreased revenue, which could adversely affect our operating results.

If our third-party contractors fail to operate in compliance with environmental requirements, properly dispose of wastes associated with our products, or comply with requirements governing the hazardous-substance content of our products, we could be held liable or suffer reputational harm.

***We may not sustain or effectively manage our growth.***

While we have experienced significant revenue growth for periods of time, we may not experience similar growth rates in future periods. In fact, in the fourth quarter of 2017 and first and second quarters of 2018, our revenue declined compared to the same quarter a year earlier. You should not rely on our operating results for any prior periods as an indication of our future operating performance. If we are unable to maintain adequate revenue growth, then our financial results could suffer, and our stock price would decline.

To manage our growth and the responsibilities of being a public company, we believe we must effectively:

- recruit, hire, train and manage qualified engineers for our research and development activities;
- add sales and marketing personnel and expand our customer-support offices;
- implement and improve administrative, financial and operational systems, procedures and controls;
- integrate and train new employees quickly and effectively; and
- coordinate growth among our executive, engineering, finance, marketing, sales, operations and customer-support organizations.

All the above activities add to our organizational complexity and increase our operating expenses.

We may have insufficient management capabilities or resources to manage our growth and business effectively. Because of our small management team, we may be unable to pursue all commercial opportunities. Accordingly, we may require significant additional resources as we increase the complexity and scale of our business operations. We may not have adequate resources when we need them, or we may not have sufficient capital to fund our resource needs. If we are unable to manage our growth effectively, we may not be able to exploit market opportunities or develop new products, and we may fail to satisfy customer requirements, maintain product quality, execute our business plan or respond to competitive pressures.

***Our management has limited public-company experience. We are subject to additional regulatory compliance requirements, including Section 404 of the Sarbanes-Oxley Act of 2002. If we fail to maintain an effective system of internal controls, we may not be able to accurately report our consolidated financial results or prevent fraud. We previously identified a material weakness in our internal control over financial reporting.***

We have a short history of operating as a public company. Some of our executive team, including our chief executive officer, have never managed a publicly traded company prior to our initial public offering and have little experience complying with the complex and everchanging laws pertaining to public companies. In addition, our chief financial officer resigned from our company effective March 30, 2018 and we are in process of identifying a replacement. Our management team as well as other company personnel devote substantial time to compliance yet may not effectively or efficiently manage our maturation as a public company. Additionally, we have incurred and will continue to incur significant legal, accounting and other expenses related to compliance.

We expect rules and regulations such as the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, to continue to increase our legal and finance compliance time and costs, and to increase the time and costs of other activities. For example, Section 404 of the Sarbanes-Oxley Act requires that management report on, and in the future, that our independent registered public accounting firm attest to, the effectiveness of our internal control over financial reporting. Effective internal controls are necessary for us to provide reliable financial reports and prevent fraud. Section 404 compliance will continue to divert resources and take significant time and effort to complete. We may be unable to successfully complete the procedures and certification and attestation requirements of Section 404 in a timely manner. In addition, the Sarbanes-Oxley Act requirements may be modified, supplemented or amended from time to time. Implementing the changes may take significant time and may require additional employee compliance training. We may discover internal controls that need improvement. Our or our independent registered public accounting firm's discovery of a material weakness, even if quickly remedied, could reduce the market's confidence in our financial statements and harm our stock price. Any inability to provide reliable financial reports or prevent fraud could harm our business.

We may be unable to effectively implement, or effectively implement in a timely manner, the necessary controls and employee training to ensure continued compliance with the Sarbanes-Oxley Act and other regulatory and reporting requirements. Our growth will challenge our ability to maintain the internal control and disclosure standards applicable to public companies. If we fail to successfully complete the procedures and certification and attestation requirements of Section 404, or if in the future our chief executive officer, chief financial officer or independent registered public accounting firm determines that our internal control over financial reporting is not effective as defined under Section 404, we could be subject to sanctions or investigations by the Securities and Exchange Commission, or SEC, or by other regulatory authorities. Investor perceptions of our company may suffer, likely causing a decline in our stock's market price. We may not be able to fully comply with the requirements of the Sarbanes-Oxley Act or that management or our independent registered public accounting firm will conclude that our internal controls are effective in future periods. Irrespective of compliance with Section 404, any failure of our internal controls could have a material adverse effect on our stated operating results and harm our reputation.

In the course of preparing our consolidated financial statements in prior years, we, in conjunction with our independent registered public accounting firm, identified errors which, combined with other identified control deficiencies, were considered to indicate a material weakness in our internal control over financial reporting related to the accounting and financial statement disclosure over complex accounting matters. The identified errors included an error in the accounting treatment for the recapitalization of our company in 2012 and the impact of the recapitalization on earnings per share that resulted in the restatement of our previously issued financial statements for the years ended December 31, 2012 and 2013. They also included, in 2015, an error related to the cash-flow statement presentation of lease incentives in our consolidated interim financial statements for the nine months ended September 30, 2015. Also, in 2016, we identified that we inadvertently did not reflect the correction of the identified error related to the cash flow statement presentation of lease incentive in our consolidated interim financial statements for the nine months ended September 30, 2015 on the statement of cash flows included in our quarterly report on Form 10-Q filed with the SEC on November 7, 2016.

A material weakness is a deficiency, or combination of control deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim consolidated financial statements will not be prevented or detected on a timely basis. We have taken steps to remediate the material weakness, including increasing the depth and experience within our accounting and finance organization, as well as designing and implementing improved processes and internal controls. As of December 31, 2018, management believes that this material weakness has been remediated. However, our remediation of this material weakness may prove not to be effective in future periods or prevent other material weaknesses or significant deficiencies in our internal control over financial reporting to arise in the future.

***We are currently subject to securities class-action litigation and may be subject to similar or other litigation in the future, all of which will require significant management time and attention, result in significant legal expenses and may result in unfavorable outcomes, which may have a material adverse effect on our business, operating results and financial condition, and negatively affect the price of our common stock.***

We are, and may in the future become, subject to various legal proceedings and claims that arise in or outside the ordinary course of business. For example, two securities class-action complaints are currently pending against us, our chief executive officer, chief operations officer and former chief financial officer, asserting that we made false or misleading statements in our financial statements, press releases and conference calls during the applicable class periods. The complaints each seek monetary damages, costs and expenses. For more information, see Note 10 of our consolidated financial statements included elsewhere in this report.

We cannot predict the outcome of these proceedings or provide an estimate of damages, if any. We believe that these claims are without merit and intend to defend against them vigorously. Failure by us to obtain a favorable resolution of the claims set forth in the complaints could have a material adverse effect on our business, results of operations and financial condition. Also, our insurance coverage may be insufficient, and our assets may be insufficient to cover any amounts that exceed our insurance coverage, and we may have to pay damage awards or otherwise may enter into settlement arrangements in connection with such claims. Any such payments or settlement arrangements in current or future litigation could have a material adverse effect on our business, operating results or financial condition. Even if the plaintiffs' claims are not successful, current or future litigation could result in substantial costs and significantly and adversely impact our reputation and divert management's attention and resources, which could have a material adverse effect on our business, operating results and financial condition, and negatively affect the price of our common stock. In addition, such lawsuits may make it more difficult to finance our operations.

***If we fail to retain finance personnel or fail to maintain our financial reporting systems and infrastructure, we may be unable to timely and accurately report our financial results or comply with the requirements of being a public company, including compliance with the Sarbanes-Oxley Act and SEC reporting requirements, which in turn could significantly harm our reputation and our business.***

We have hired personnel with financial reporting and Sarbanes-Oxley Act compliance expertise. Our inability to retain these personnel could adversely impact our ability to timely and accurately prepare our financial statements. Further, our inability to retain employees with the requisite experience could adversely affect our financial statements because new employees require time and training to learn our business and operating procedures. If our finance and accounting organization is unable for any reason to meet the increased demands of being a public company then the quality and timeliness of our financial reporting may suffer, which could result in material weaknesses in our internal controls. The consequences of inaccuracies or delays in our reported financial statements could cause the trading price of our common stock to decline and could harm our business, operating results and financial condition.

***We may need to raise additional capital which may not be available on favorable terms, if at all, causing dilution to stockholders, restricting our operations or adversely affecting our ability to operate our business.***

In the course of running our business we may need to raise capital, diluting our stockholders. If our need is due to unforeseen circumstances or material expenditures or if our operating results are worse than expected then we cannot be certain that we will be able to obtain additional financing on favorable terms, if at all, and these additional financings could cause additional dilution to our stockholders. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions such as incurring additional debt, expending capital, or declaring dividends, or which impose financial covenants on us that limit our ability to achieve our business objectives. If we need but cannot raise additional capital on acceptable terms then we may not be able to meet our business objectives, our stock price may fall, and you may lose some or all of your investment.

Further, because we did not timely file our Quarterly Report on Form 10-Q for the quarter ended June 30, 2018, we are ineligible to use a registration statement on Form S-3 to raise capital and will continue to be ineligible to use such registration statement until at least September 1, 2019. Our inability to take advantage of the benefits afforded by Form S-3 will limit our financing alternatives and may significantly increase our cost of capital, as transactions effected using a registration statement on Form S-3 are simpler and less costly to execute and may be perceived by potential investors as being more attractive than those effected in a different manner. If financing is available, the terms of such financing may place restrictions on us and adversely affect the trading price of our common stock and the interests of our existing stockholders.

***Our debt obligations contain restrictions that impact our business and expose us to risks that could adversely affect our liquidity and financial condition.***

We have a loan and security agreement, or senior credit facility, with Silicon Valley Bank. As amended in March and August 2018, the senior credit facility provides for (1) a \$25.0 million revolving credit facility, with a \$5.0 million letter of credit sub-facility (2) a \$20.0 million term loan and (3) a \$4.0 million equipment advance. At December 31, 2018, we had \$23.7 million of term loan and equipment advance borrowings outstanding, excluding \$0.1 million of unamortized debt issuance costs, and no revolver borrowings outstanding.

Our senior credit facility contains customary covenants, which limit our and our subsidiaries' ability to, among other things:

- incur additional indebtedness or guarantee indebtedness of others;
- create liens on our assets;
- enter into mergers or consolidations;
- dispose of assets;
- pay dividends and make other distributions on our capital stock, and redeem and repurchase our capital stock;
- make investments, including acquisitions; and
- enter into transactions with affiliates.

If our cash in accounts maintained with the lender, plus available revolver borrowings, falls below \$60.0 million for the period of time beginning on March 5, 2018 and ending on December 31, 2018, or \$55.0 million for the period of time beginning on January 1, 2019 and at all times thereafter, we must comply with a covenant to not exceed maximum adjusted EBITDA loss thresholds that vary by period as well as a minimum liquidity ratio, each determined in accordance with the terms of the senior credit facility.

If we experience a decline in cash flow due to any of the factors described in this "Risk Factors" section or otherwise, we could have difficulty paying interest and principal amounts due on our indebtedness and meeting the financial covenants set forth in our senior credit facility. If we are unable to generate sufficient cash flow or otherwise obtain the funds necessary to make required payments under our senior credit facility, or if we fail to comply with the requirements of our indebtedness, we could default under our senior credit facility. Any such default that is not cured or waived could result in the acceleration of the obligations under the senior credit facility, an increase in the applicable interest rate under the senior credit facility, the termination of the revolving commitment, and would permit our lender to exercise remedies with respect to all of the collateral that is securing the senior credit facility, including substantially all of our assets, other than intellectual property. Any such default could have a material adverse effect on our liquidity and financial condition.

Even if we comply with all of the applicable covenants, the restrictions on the conduct of our business could adversely affect our business by, among other things, limiting our ability to take advantage of financings, mergers, acquisitions and other corporate opportunities that may be beneficial to the business.

***A breach of our security systems could have a material adverse effect on our business.***

We use security systems to maintain our facility's physical security and to protect our proprietary and confidential information, including that of our customers, suppliers and employees. Accidental or willful security breaches or other unauthorized access to our facilities or information systems, or viruses, loggers, or other malfeasant code in our data or software, could compromise access to and the integrity of this information. The consequences of such loss and possible misuse of our proprietary and confidential information could include, among other things, unfavorable publicity, damage to our reputation, difficulty marketing our products, customer allegations of breach-of-contract, litigation by affected parties and possible financial liabilities for damages, any of which could have a material adverse effect on our business, financial condition, reputation and relationships with customers and partners. We also rely on third-party providers of corporate infrastructure services relating to, among other things, human resources, electronic communication services and some financial functions, and we are therefore dependent on the security systems of these providers. Any security breaches or other unauthorized access to our service-providers' systems or viruses, loggers, or other malfeasant code in their data or software could expose us to information loss and misappropriation of confidential information. Because the techniques used to obtain unauthorized access to or sabotage security systems change frequently and are often not recognized until after an attack, we may be unable to anticipate the techniques or implement adequate preventative measures, thereby exposing us to material adverse effect on our business, operations and financial condition.

***Our operations could be disrupted by natural disasters.***

An earthquake, fire, flood or other natural or manmade disaster could disable our facilities, disrupt operations, or cause catastrophic losses. We have facilities in areas with a known history of seismic activity, such as our headquarters in Seattle, Washington. We also have facilities in areas with a known history of flooding, such as our office in Shanghai, China. We have a wafer testing and dicing subcontractor in Thailand, a region with a known, and quite recent, history of flooding. A loss at or of any of these or other of our or our suppliers' facilities could disrupt operations, delay production and shipments, reduce revenue and engender potentially large expenses to repair or replace the facility. As a specific example, in 2011 and 2012 floods in Thailand disrupted our subcontractor's facility for approximately six months. During that time, we relied on a secondary subcontractor that had longer lead times for, and decreased yield of, our endpoint IC wafers. We do not carry insurance policies that cover potential losses caused by earthquakes, floods or other disasters.

***Our ability to use net operating losses to offset future taxable income may be limited.***

As of December 31, 2018, we had federal net operating loss carryforwards, or NOLs, of \$159.5 million and federal research and experimentation credit carryforwards of \$10.6 million which we may use to reduce future taxable income or offset income taxes due. We have established a valuation allowance against the carrying value of our deferred tax assets. The tax loss and research and development credit carryforwards begin to expire in 2023. Insufficient future taxable income will adversely affect our ability to utilize these NOLs and credit carryforwards. Reductions in corporate tax rates may reduce the realization of the NOLs. In addition, under Sections 382 and 383 of the U.S. Internal Revenue Code, or the Code, a corporation that experiences a more-than 50% ownership change over a three-year testing period is limited in its ability to use its pre-change NOLs and other tax assets to offset future taxable income or income taxes due. Our existing NOLs and credit carryforwards may be subject to limitations arising from previous ownership changes; if we undergo an ownership change then our ability to use our NOLs and credit carryforwards could be further limited by Sections 382 and 383 of the Code. Future changes in our stock ownership, the causes of which may be outside our control, could result in an ownership change under Sections 382 and 383 of the Code. Our NOLs may also be impaired under state law. As a result of these limitations, we may not be able to utilize a material portion of, or possibly any of, the NOLs and credit carryforwards.

***We could be subject to additional income tax liabilities.***

We are subject to income taxes in the United States and certain foreign jurisdictions. We use significant judgment in evaluating our worldwide income-tax provision. During the ordinary course of business, we conduct many transactions for which the ultimate tax determination is uncertain. For example, our effective tax rates could be adversely affected by earnings being lower than anticipated in countries where we have lower statutory rates and higher than anticipated in countries where we have higher statutory rates, by changes in currency exchange rates, by changes in the valuation of our deferred tax assets and liabilities or by changes in the relevant tax, accounting and other laws, regulations, principles and interpretations. We are subject to audit in various jurisdictions, and such jurisdictions may assess additional income tax against us. Although we believe our tax estimates are reasonable, the final determination of tax audits and any related litigation could be materially different from our historical income-tax provisions and accruals. The results of an audit or litigation could have a material effect on our operating results or cash flows in the period or periods for which that determination is made.

***Taxing authorities may successfully assert that we should have collected or in the future should collect sales and use, value-added or similar taxes, and we could be subject to liability with respect to past or future sales, which could adversely affect our operating results.***

We do not collect sales and use, value-added or similar taxes in all jurisdictions in which we have sales, based on our belief that such taxes are either not applicable or an exemption from such taxes applies. Sales and use, value-added and similar tax laws and rates vary greatly by jurisdiction. Certain jurisdictions in which we do not collect such taxes may assert that such taxes are applicable, which could result in tax assessments, penalties and interest, and we may be required to collect such taxes in the future, including as a result of a change in law. Such tax assessments, penalties and interest or future requirements may adversely affect our operating results.

**Risks Relating to the Ownership of Our Common Stock**

***The market price of our common stock has been and will likely continue to be volatile, and the value of your investment could decline significantly.***

There was no public market for our common stock prior to our initial public offering. Since July 2016, when we sold shares of our common stock in our initial public offering at a price of \$14.00 per share, through December 31, 2018, our stock price has ranged from \$9.95 to \$60.85. Securities of companies similar to ours experience significant price and volume fluctuations. The following factors, in addition to other risks described in this report, may have a significant effect on our common stock price:

- price and volume fluctuations in the overall stock market from time to time;
- changes in operating performance, stock market valuations, and volatility in the market prices of other technology companies generally, or those in our industry in particular;
- actual or anticipated quarterly variations in our results of operations or those of our competitors;
- actual or anticipated changes in our growth rate relative to our competitors;
- delays in end-user deployments of RAIN systems;
- announcements by us or our competitors of acquisitions, new products, significant contracts, commercial relationships or capital commitments;
- supply interruptions;
- developments with respect to intellectual property rights;
- our ability to develop and market new and enhanced products on a timely basis;
- commencement of, or our involvement in, litigation;
- changes in our board of directors or management;
- changes in governmental regulations or in the status of our regulatory approvals;
- unstable regional political and economic conditions, such as those caused by the U.S. presidential election and the U.K. referendum to leave the EU;
- the trading volume of our stock;
- limited public float;
- any future sales of our common stock or other securities;
- failure of financial analysts to maintain coverage of us, changes in financial estimates by any analysts who follow our company, or our failure to meet these estimates or the expectations of investors;
- fluctuations in the values of companies perceived by investors to be comparable to us;

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- the financial projections we may provide to the public, any changes in these projections or our failure to meet these projections; and
- general economic conditions and slow or negative growth of related markets.

In addition, the stock market in general, and the market for technology companies in particular, has experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. Broad market and industry factors may seriously affect our stock price, regardless of our actual operating performance. In addition, in the past, securities class action litigation has often been instituted against companies whose stock prices have declined, especially following periods of volatility in the overall market. Litigation instituted against us could result in substantial costs and a diversion of our management's attention and resources. For further information regarding this risk, please refer to Note 10 of our consolidated financial statements included elsewhere in this report.

***If securities or industry analysts do not publish research reports about our business, or if they issue an adverse opinion about our business, our stock price and trading volume could decline.***

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. If one or more of the analysts who cover us issues an adverse opinion about our company, our stock price would likely decline. If one or more of these analysts ceases coverage of us or fails to regularly publish reports on us, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

***Future sales of our common stock in the public market could cause our stock price to fall.***

Sales of a substantial number of shares of our common stock into the public market, particularly sales by our directors, executive officers, and principal stockholders, or the perception that these sales might occur, could cause the market price of our common stock to decline. These sales, or the possibility that these sales may occur, also might make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate.

In addition, in the future, we may issue additional shares of common stock or other equity or debt securities convertible into common stock in connection with a financing, acquisition, litigation settlement, employee arrangement or otherwise. Any such issuance could result in substantial dilution to our existing stockholders and could cause our stock price to decline.

***Our principal stockholders and management own a significant percentage of our stock and are able to exercise significant influence over matters subject to stockholder approval.***

As of December 31, 2018, our executive officers, directors and principal stockholders, together with their respective affiliates, beneficially owned approximately 39.1% of our capital stock. As a result, our executive officers, directors and principal stockholders, if acting together, may be able to significantly influence, in their capacity as stockholders, matters requiring approval by our stockholders, including the election of directors and the approval of mergers, acquisitions or other extraordinary transactions. They may also have interests that differ from yours and may vote in a way with which you disagree and which may be adverse to your interests. This concentration of ownership could have the effect of delaying or preventing a change in our control or otherwise discouraging a potential acquirer from attempting to obtain control of us, which in turn could have a material adverse effect on our stock price and may prevent attempts by our stockholders to replace or remove our board of directors or management.

***Anti-takeover provisions in our charter documents and under Delaware or Washington law could make an acquisition of us difficult, limit attempts by our stockholders to replace or remove our current management and limit our stock price.***

Provisions of our certificate of incorporation and bylaws may delay or discourage transactions involving an actual or potential change in our control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our stock. Among other things, our certificate of incorporation and bylaws:



- permit our board of directors to issue up to 5,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate;
- provide that the authorized number of directors may be changed only by resolution of the board of directors;
- provide that all vacancies, including newly created directorships, may, except as otherwise required by law, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- divide our board of directors into three classes;
- restrict the forum for certain litigation against us to Delaware;
- require that any action to be taken by our stockholders must be effected at a duly called annual or special meeting of stockholders and may not be taken by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide notice in writing in a timely manner, and also specify requirements as to the form and content of a stockholder's notice;
- do not provide for cumulative voting rights (therefore allowing the holders of a plurality of the shares of common stock entitled to vote in any election of directors to elect all of the directors standing for election, if they should so choose);
- provide that special meetings of our stockholders may be called only by the chair of the board, our chief executive officer or by the board of directors; and
- provide that stockholders will be permitted to amend our bylaws only upon receiving at least two-thirds of the total votes entitled to be cast by holders of all outstanding shares then entitled to vote generally in the election of directors, voting together as a single class.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which generally prohibits a Delaware corporation from engaging in any of a broad range of business combinations with any "interested" stockholder for a period of three years following the date on which the stockholder became an "interested" stockholder. Likewise, because our principal executive offices are located in Washington, the anti-takeover provisions of the Washington Business Corporation Act may apply to us under certain circumstances now or in the future. These provisions prohibit a "target corporation" from engaging in any of a broad range of business combinations with any stockholder constituting an "acquiring person" for a period of five years following the date on which the stockholder became an "acquiring person."

***Our bylaws provide that the Court of Chancery of the State of Delaware is the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.***

Our bylaws provide that, unless we otherwise consent in writing, the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our certificate of incorporation or our bylaws or any action asserting a claim against us that is governed by the internal affairs doctrine. The choice of forum provision may limit stockholders' ability to bring a claim in a judicial forum favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find the choice of forum provision contained in our bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business and financial condition.



*As an emerging growth company within the meaning of the Securities Act, we will utilize certain modified disclosure requirements, and we cannot be certain if these reduced requirements will make our common stock less attractive to investors.*

We are an emerging growth company, and for as long as we continue to be an emerging growth company, we may choose to take advantage of exemptions from various reporting requirements applicable to other public companies but not to “emerging growth companies” including:

- not being required to have our independent registered public accounting firm audit our internal control over financial reporting under Section 404 of the Sarbanes-Oxley Act;
- reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We plan in filings with the SEC to continue to utilize the modified disclosure requirements available to emerging growth companies. As a result, our stockholders may not have access to certain information they may deem important.

We could remain an “emerging growth company” for up to five years from July 20, 2016, or until the earliest of:

- the last day of the first fiscal year in which our annual gross revenue exceeds \$1 billion;
- the date that we become a “large accelerated filer” as defined in Rule 12b-2 under the Exchange Act, which would occur if the market value of our common stock that is held by non-affiliates exceeds \$700 million as of the last business day of our most recently completed second fiscal quarter; or
- the date on which we have issued more than \$1 billion in non-convertible debt during the preceding three-year period.

*We have incurred and will continue to incur costs by being a public company.*

As a public company, we have and will incur significant legal, accounting and other expenses, including costs associated with public-company reporting requirements. We have and will incur costs associated with recently adopted corporate governance requirements, including requirements of the SEC and The Nasdaq Global Select Market. We expect these rules and regulations to lead to ongoing legal and financial compliance costs and to make some activities incrementally more time consuming and costly. We also expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, we may have more difficulty attracting and retaining qualified individuals to serve on our board of directors or as executive officers. We are currently evaluating and monitoring developments with respect to these rules, and we cannot predict or estimate the additional costs we may incur or the timing of such costs.

So long as we remain an “emerging growth company,” we expect to avail ourselves of the exemption from the requirement that our independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting under Section 404. When our independent registered public accounting firm is required to undertake an assessment of our internal control over financial reporting, the cost of our compliance with Section 404 will correspondingly increase. Moreover, if we are not able to comply with the requirements of Section 404 applicable to us in a timely manner, or if we or our independent registered public accounting firm identifies deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by the SEC or other regulatory authorities, which would require additional financial and management resources

#### **Item 1B. Unresolved Staff Comments**

Not applicable.

**Item 2. Properties**

We have various operating leases for office space, which are summarized as of December 31, 2018 in the table below. We believe that our facilities are adequate for our current needs.

<u>Location</u>	<u>Purpose</u>	<u>Approximate Square Feet</u>	<u>Principal Lease Expiration Dates</u>
Seattle, Washington	Corporate headquarters	70,000	2026
Seattle, Washington	Design laboratory office	11,000	2021
Shanghai, China	General office space	4,000	2021

We lease offices in Thailand. We also hold a lease for approximately 39,000 square feet of commercial office space in Seattle, Washington expiring in 2023, and we have sublet the entire portion of this office through such expiration date. For more information about our lease commitments, please refer to Note 10 to our consolidated financial statements included elsewhere in this report .

**Item 3. Legal Proceedings**

In the normal course of business, we may be named as a party to various legal claims, actions and complaints. We cannot predict whether any resulting liability will have a material adverse effect on our financial position, results of operations or cash flows.

Between July 2018 and January 2019, four class action complaints for violation of federal securities laws (one of which was subsequently voluntarily dismissed by the plaintiffs) and two shareholder derivative actions were filed against us and certain of our officers and, in the derivative actions, against certain of our directors. For further information, please refer to Note 10 of our audited consolidated financial statements included elsewhere in this report.

**Item 4. Mine Safety Disclosures**

Not applicable.

**PART II**

**Item 5. Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities**

**Market Information**

Our common stock has traded on The Nasdaq Global Select Market under the symbol “PI” since July 21, 2016.

**Holders of Record**

As of January 31, 2019, there were 65 holders of record of our common stock. The actual number of stockholders is greater than the number of holders of record and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. The number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

**Dividends**

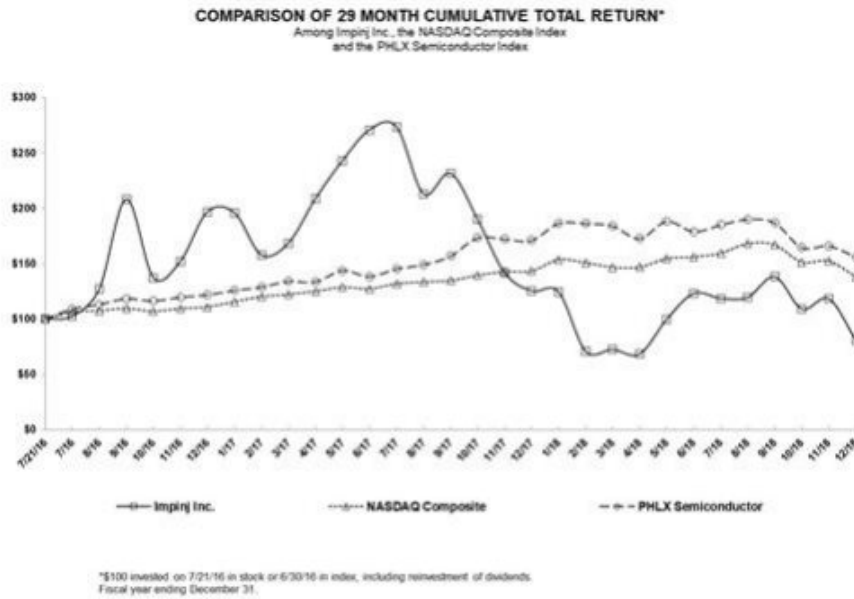
We have never declared or paid a cash dividend on our common stock and we intend to retain all available funds and any future earnings to fund the development and growth of our business. We therefore do not anticipate paying any cash dividends on our common stock for the foreseeable future. In addition, our senior credit facility materially restricts, and future debt instruments, if any, may materially restrict our ability to pay dividends on our common stock. Any future determination to pay dividends on our common stock will depend at least on our results of operations, our financial condition and liquidity requirements, restrictions that may be imposed by applicable law or by contracts, and any other factors that our board of directors may consider relevant.

**Use of Proceeds from Public Offerings of Common Stock**

On July 20, 2016, our registration statement on Form S-1 (No. 333-211779) was declared effective for our initial public offering, or IPO. There has been no material change in the planned use of proceeds from our IPO from that described in the final prospectus dated July 20, 2016 filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act. Pending the uses described, we have invested the net proceeds in short-term, investment-grade interest-bearing securities such as U.S. government agencies, corporate notes and bonds, commercial paper, and money market funds.

### Performance Graph

The following graph compares our cumulative total stockholder return on Impinj's common stock with the NASDAQ Composite Index and the Philadelphia Semiconductor Index:



This graph covers the period from July 21, 2016, using the closing price for the first day of trading immediately following the effectiveness of our initial public offering per SEC regulations, through December 31, 2018. This graph assumes that the value of the investment in Impinj's common stock and each index (including reinvestment of dividends) was \$100 on July 21, 2016.

**Item 6. Selected Financial Data**

You should read the selected financial data set forth below in conjunction with the information in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our audited consolidated financial statements and related notes included elsewhere in this report and our previous financial statements, not included in this report.

	<b>Year Ended December 31,</b>				
	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>(in thousands, except per share data)</b>					
<b>Statements of Operations Data:</b>					
Revenue	\$ 122,633	\$ 125,300	\$ 112,287	\$ 78,479	\$ 63,763
Cost of revenue	64,352	60,359	52,834	37,633	30,121
Gross profit	58,281	64,941	59,453	40,846	33,642
<b>Operating expenses:</b>					
Research and development expense	34,168	32,220	25,185	17,579	14,287
Sales and marketing expense	32,934	31,579	22,330	14,579	10,825
General and administrative expense	22,299	18,161	12,426	7,087	6,115
Offering costs	—	—	—	—	1,959
Restructuring costs	3,749	—	—	—	—
Total operating expenses	93,150	81,960	59,941	39,245	33,186
Income (loss) from operations	(34,869)	(17,019)	(488)	1,601	456
Other income, net	808	508	616	673	838
Interest expense	(1,403)	(908)	(1,633)	(1,208)	(901)
Income (loss) before income taxes	(35,464)	(17,419)	(1,505)	1,066	393
Income tax benefit (expense)	233	97	(168)	(166)	(96)
Net income (loss)	(35,231)	(17,322)	(1,673)	900	297
Less: Accretion of preferred stock <sup>(1)</sup>	—	—	(6,258)	(11,301)	(11,301)
Net loss attributable to common stockholders	\$ (35,231)	\$ (17,322)	\$ (7,931)	\$ (10,401)	\$ (11,004)
Net loss per share attributable to common stockholders — basic and diluted <sup>(2)</sup>	\$ (1.65)	\$ (0.84)	\$ (0.74)	\$ (2.67)	\$ (3.30)
Weighted-average shares used to compute net loss per share attributable to common stockholders — basic and diluted	21,334	20,680	10,778	3,893	3,338

<sup>(1)</sup> See Note 8 of the notes to our consolidated financial statements included elsewhere in this report for the explanation of the accretion of redeemable convertible preferred stock.

<sup>(2)</sup> See Note 14 of the notes to our consolidated financial statements included elsewhere in this report for an explanation of the calculation of our net loss per share attributable to common stockholders — basic and diluted.

	<b>As of December 31,</b>				
	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>(in thousands)</b>					
<b>Balance Sheet Data:</b>					
Cash, cash equivalents and short-term investments	\$ 56,073	\$ 58,116	\$ 100,541	\$ 10,121	\$ 6,939
Working capital	98,189	109,879	123,345	18,468	12,169
Total assets	145,069	152,034	167,536	52,848	33,817
Total long-term debt	23,563	9,588	12,265	15,910	7,974
Accumulated deficit	(239,756)	(204,525)	(187,203)	(185,315)	(186,215)
Total stockholders’ equity (deficit) <sup>(1)</sup>	\$ 145,069	\$ 118,942	\$ 124,023	\$ (85,035)	\$ (76,471)

<sup>(1)</sup> See Note 8 of the notes to our consolidated financial statements included elsewhere in this report for the explanation of the automatic conversion of redeemable convertible preferred stock upon the effectiveness of the registration statement related to our initial public offering.

## **Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations**

*You should read the following discussion and analysis together with our consolidated financial statements and the related notes to those statements included elsewhere in this report. This discussion contains forward-looking statements that involve risks and uncertainties. As a result of many factors, such as those set forth under “Risk Factors” and elsewhere in this report, our actual results may differ materially from those anticipated in these forward-looking statements.*

### **Overview**

Our vision is digital life for everyday items. We are driving toward a future in which everyday physical items have digital counterparts, digital twins, in the cloud, and in which businesses and people engage with trillions of those everyday physical items via their digital twins. Our mission is to deliver a platform that powers that item-to-cloud connectivity, enabling developers to innovate Internet-of-Things, or IoT, applications on our platform. Today, we deliver the identity, location and authenticity of billions of physical items; our future is enabling those cloud-based digital twins, each storing an individual item’s ownership, history and links, and enabling ubiquitous access to them. We believe the item-to-cloud connectivity we will deliver will enhance businesses efficiencies and commerce and, ultimately, improve peoples’ lives.

Our platform connects individual items, capturing and delivering data about each item from manufacturing, through distribution to sale. We envision a future where we extend and deliver an item’s digital life to the person that purchases and owns it. We and our channel partners connect items via a miniature radio chip embedded in the item or in its packaging, reading and delivering the item’s unique identity, location and authenticity to business and consumer applications. To date, we have enabled connectivity to more than 30 billion items, enabling retailers, hospitals, airlines, automotive manufacturers, supply chain and logistics and business in many other industries to derive timely business value from those connected items. Our opportunity is to connect billions, ultimately possibly trillions of everyday items, and to deliver valuable information about these items not just to businesses, but also to people.

Our platform comprises endpoint ICs, connectivity and software that together deliver item data to business applications. We link the layers of our platform to deliver advanced capabilities and performance that surpasses mix-and-match solutions built from competitor products. Within each layer we sell one or more product families.

### **Factors Affecting Our Performance**

#### ***Investing in Growth***

We have invested and plan to continue investing significantly in research and development to enhance and extend our platform, including enhancing existing platform products and introducing new platform products. We plan to enhance our operating system software, including its deployment models and functionalities; and our fixed readers and gateways and leverage them for platform deployments in retail, healthcare, supply chain and other industries. We also plan to develop next-generation reader and endpoint ICs. We may enter into arrangements with customers, vendors and channel partners to fund a portion of certain of these research and development initiatives. If we are unsuccessful in attracting such funding, our operating results and product time-to-market may be adversely affected.

We also are investing in sales and marketing and are deepening product integration with our software partners to accelerate the development and adoption of solutions based on our platform. Many of these investments will occur in advance of us experiencing any direct benefit from them and may affect our profitability in future periods.

### ***Market Adoption***

Our financial performance generally depends upon the rate, scope and depth of end-user adoption of our products in multiple industries, including the retail industry which is our largest market. In 2015 and 2016 some major retailers and brand owners initiated new deployments that significantly increased our endpoint IC sales. In 2016, our endpoint IC sales exceeded both our expectations and those of our industry's analysts and resulted in longer lead times. As a result of those 2016 trends, we invested in endpoint IC inventory both to meet forecasted demand and to enhance our ability to deliver in the event of another unexpected demand surge. However, in the second half of 2017 the growth rate in endpoint IC shipments decelerated, which we believe was due to multiple factors including, but not limited to, delays in new deployments and in planned expansions at several large retailers. That decelerating growth engendered an endpoint IC channel inventory correction. For working capital management purposes, we reduced our internal endpoint IC inventory in the second half of 2018 and intend to reduce it further in 2019.

Regardless of the uneven pace of retail industry adoption, we believe the underlying, long-term trend is continued RAIN adoption by the retail industry. We also believe that expanding retail deployments foster RAIN adoption in other markets. Consequently, we intend to continue introducing new products to improve our market positioning and to further grow both retail and overall market adoption.

For a non-retail example of growing RAIN adoption, our reader and gateway sales in the second half of 2017 exceeded our expectations, due to end users deploying shipment-verification and asset-tracking use cases that demand real-time fixed reading and RAIN data integration with enterprise software systems. In addition, we see growing RAIN adoption in the aviation industry. We believe greater adoption of fixed readers and our software will increase the value of our platform.

If market adoption of RAIN, and our platform products specifically, does not meet our expectations, then our growth prospects and operating results will be adversely affected. If we discount prices to win opportunities, then our gross margins may be negatively affected. If we are unable to meet end-user or customer volume or performance expectations, then our business and prospects may be adversely affected. Because we sell our products through our channel partners, we have limited ability to determine end-user demand and we may incorrectly predict that demand or be unable to identify market shifts in a timely fashion, potentially affecting our business adversely. In contrast, if our endpoint IC, reader IC, reader, gateway or software sales exceed expectations then our revenue and profitability may be positively affected.

### ***Timing and Complexity of Customer Deployments***

From 2010 to 2018, our endpoint IC unit sales volume increased at a compounded annual growth rate of 29%, indicating growing adoption of RAIN-based solutions. However, the pace at which end users adopt these solutions has been uneven and unpredictable in scope and timing. Using endpoint IC volumes as a proxy for solutions growth, sales volumes accelerated significantly in 2016, decelerated in the second half of 2017 and returned to growth in the second half of 2018 (albeit not at the same pace as in 2016). Short-term demand will remain unpredictable in scope and timing. Longer term, we believe our opportunity and our market will continue to grow, but we cannot predict whether historical annual growth rates are indicative of the pace of that future growth. Further, although we promote our platform as an integrated whole, we sell our products individually, and end users may use only certain of our products. For any given end-user solution, whether an end user chooses to deploy our entire platform or only a portion will also affect our operating results.

We have a large and multi-tiered partner channel which serves many markets and end users; we rely on these channel partners to deploy or integrate our platform and products with end-user applications and information systems. If our partners fail to deploy or integrate our platform and products properly or as planned then sales of our products and our reputation may be adversely affected. As a result of these factors and our reliance on our channel partners, we may experience significant fluctuation in revenue on a quarterly basis, and we anticipate these factors will continue to characterize our business for the foreseeable future. Therefore, we focus on annual results as they are more relevant for planning and for evaluating our performance than quarterly results.

### *Average Selling Price*

We expect our average selling prices, or ASPs, to fluctuate based on competitive pressures and the level of discounting we offer to win opportunities, and generally to decline over time. Historically, we have been able to implement manufacturing and quality improvements that effectively reduce the per-unit cost of most of our hardware products, as well as introduce newer and lower-cost products, but the timing of these cost reductions and product introductions fluctuates and may not materialize in any given quarter or year.

### *Inventory Supply*

From time to time we may experience high inventory levels or product shortages, generally as a result of mis-estimating customer or end-user demand or supplier manufacturing capacity, but also sometimes related to fluctuations in our market or the global economy, changes in regulations or tariffs, or for a host of other reasons. These inventory dynamics can impact some or all of our hardware products. High inventory levels can result in product obsolescence, increases in reserves or unexpected expenses that could adversely affect our business. Low inventory levels can affect our ability to meet customer demand, lengthening lead times and potentially causing us to miss opportunities, lose market share and/or damage customer relationships.

## Results of Operations

(in thousands, except percentages)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Revenue	\$ 122,633	\$ 125,300	\$ 112,287	\$ (2,667)	\$ 13,013
Gross profit	\$ 58,281	\$ 64,941	\$ 59,453	\$ (6,660)	\$ 5,488
<i>Gross margin</i>	<i>47.5%</i>	<i>51.8%</i>	<i>52.9%</i>	<i>(4.3)%</i>	<i>(1.1)%</i>
Loss from operations	\$ (34,869)	\$ (17,019)	\$ (488)	\$ (17,850)	\$ (16,531)

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Revenue and gross profit decreased primarily due to decreased endpoint IC sales arising from lower ASPs, partially offset by increased systems sales. We define systems as reader ICs, modules, readers, gateways and software. Gross margin decreased primarily due to lower endpoint IC gross margin arising from lower ASPs, as well as from higher manufacturing overhead costs for both endpoint ICs and systems, the latter including inventory excess and obsolescence charges recorded in 2018 primarily on EU readers and gateways. Loss from operations increased due to increased stock-based compensation expense, restructuring costs, decreased gross profit as described above and costs attributable to an independent investigation by the audit committee of our board of directors in connection with a complaint filed by a former employee. The outcome of the independent investigation was the audit committee of our board of directors concluding no credible evidence supported the former employee's claims.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Revenue and gross profit increased primarily due to increased endpoint IC and systems sales. Gross margin decreased primarily due to a decrease in ASPs for endpoint ICs, with a smaller impact from a sales returns reserve. Loss from operations increased primarily due to higher operating expenses from headcount growth across all corporate functions and from us expanding our corporate infrastructure including occupancy, depreciation and software costs, partially offset by improved gross profit.

### *Revenue*

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Endpoint ICs	\$ 84,974	\$ 91,699	\$ 86,218	\$ (6,725)	\$ 5,481
Systems	37,659	33,601	26,069	4,058	7,532
Total revenue	\$ 122,633	\$ 125,300	\$ 112,287	\$ (2,667)	\$ 13,013



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We currently derive substantially all our revenue from sales of our endpoint ICs, reader ICs, modules, readers and gateways. We sell our endpoint ICs primarily to inlay manufacturers. We sell our reader ICs and modules primarily to OEMs and ODMs through distributors. We sell our readers and gateways to VARs and system integrators, primarily through distributors. We are beginning to sell software through these same VAR and systems-integration partners as well as through ISVs. Although we expect endpoint IC sales to represent a majority of our revenue for the foreseeable future, we also expect revenue from reader ICs, modules, readers, gateways and software sales to increase as a percentage of the total as a result of our investment in engineering, sales and marketing associated with our solutions business and our focus on our integrated platform, including software.

#### Endpoint ICs

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Endpoint IC revenue decreased \$6.7 million on similar volumes primarily due to a decrease in ASPs, with volume growth impacted by the channel inventory correction described above and ASPs impacted by the competitive environment, partially offset by revenue recognized related to a product exchange we completed in the first quarter of 2018. In 2017, endpoint IC revenue was impacted by a sales returns reserve of \$3.2 million related to the product exchange; we recognized \$3.2 million revenue upon completing the product exchange in the first quarter of 2018.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Endpoint IC revenue increased \$5.5 million, primarily due to 15% increased unit volumes, partially offset by a decrease in ASPs due to the competitive environment and product mix. Endpoint IC revenue was also impacted by the sales returns reserve of \$3.2 million described above.

#### Systems

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Systems revenue increased \$4.1 million primarily due to an increase in reader IC and gateway revenue from both higher unit volumes and ASPs, partially offset by a decrease in reader revenue from both lower unit volumes and ASPs.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Systems revenue increased \$7.5 million primarily due to an increase in reader IC and reader revenue from higher unit volumes partially offset by lower ASPs.

#### **Gross Profit and Gross Margin**

(in thousands, except percentages)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Gross profit	\$ 58,281	\$ 64,941	\$ 59,453	\$ (6,660)	\$ 5,488
Gross margin	47.5%	51.8%	52.9%	(4.3)%	(1.1)%

Cost of revenue includes costs associated with manufacturing our endpoint ICs, reader ICs, modules, readers and gateways, including direct materials and outsourced manufacturing costs as well as associated overhead costs such as logistics, quality control, planning and procurement. Cost of revenue also includes charges for excess and obsolescence and warranty costs. Our gross margin varies from period to period based on ASPs, including product mix, as well as from charges for excess and obsolescence. Historical gross margin has remained relatively consistent at between 47% and 55% for the interim and annual periods during the last three fiscal years.

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Gross profit decreased \$6.7 million primarily due to decreased endpoint IC revenue, partially offset by increased reader IC and gateway revenue as well as from revenue recognized from the product exchange described above. Gross margin decreased 4.3% primarily due to the lower ASPs of our endpoint ICs, caused by the competitive environment as noted above. The gross-margin decrease was partially offset by an increase in the percentage of total revenue attributable to systems, which generally have higher gross margins than endpoint ICs. In addition, both gross profit and gross margin were negatively impacted by higher manufacturing overhead costs, which includes inventory excess and obsolescence charges that, for 2018, were related primarily to European Commission approval of RAIN spectrum expansion, which may slow demand for existing EU reader and gateway products that do not leverage the additional spectrum. Inventory excess and obsolescence charges had an unfavorable net gross-margin impact of 1.2% in 2018.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Gross profit increased \$5.5 million primarily due to increased endpoint IC, reader IC and reader revenue as described above. Gross margin decreased primarily due to lower ASPs for endpoint ICs arising from competitive pressures, with a smaller impact due to the sales returns reserve mentioned above. The gross-margin decrease was partially offset by favorable endpoint IC product mix and pricing discounts from our suppliers. Gross margin also decreased, but to a lesser extent, from a decrease in ASPs for readers and gateways as we discounted prices to win opportunities and substituted higher-cost products to meet customer demand; partially offset by an increasing percentage of total revenue attributable to systems, which generally have higher gross margins than our endpoint ICs.

**Operating Expenses**

*Research and Development*

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Research and development	\$ 34,168	\$ 32,220	\$ 25,185	\$ 1,948	\$ 7,035

Research and development expense consists primarily of personnel expenses (salaries, benefits and other employee related costs) and stock-based compensation expense for our product-development personnel; external consulting and service costs; prototype materials; other new product development costs; and an allocated portion of infrastructure costs which include, occupancy, depreciation and software costs. We expect research and development expense to moderately increase in absolute dollars in future periods as we focus on new product development and introductions.

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Research and development expense increased \$1.9 million, comprised primarily of \$1.2 million in stock-based compensation expense from annual grants and \$1.1 million in personnel expenses from a change in headcount mix, and, to a lesser extent, bonus expense in the current year compared to non-achievement in the prior year.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Research and development expense increased \$7.0 million due to increased investment in current and future product initiatives, comprised primarily of \$2.9 million in personnel expenses, \$2.0 million in other new-product development costs, \$1.4 million in stock-based compensation expense and \$600,000 in infrastructure-related costs.

*Sales and Marketing*

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Sales and marketing	\$ 32,934	\$ 31,579	\$ 22,330	\$ 1,355	\$ 9,249

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Selling and marketing expense consists primarily of personnel expenses (salaries, variable compensation, benefits and other employee related costs) and stock-based compensation expense for our sales personnel, as well as travel, advertising and promotional expenses and an allocated portion of infrastructure costs which include, occupancy, depreciation and software costs. We expect sales and marketing expense to remain relatively constant on an absolute dollar basis. We expect incentive sales compensation to fluctuate as a function of revenue .

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Sales and marketing expense increased \$1.4 million, comprised primarily of \$1.2 million in personnel expenses from higher commissions and bonus expense in the current year compared to non-achievement in the prior year, \$1.1 million in stock-based compensation expense from annual grants and a decrease of \$566,000 in marketing and advertising costs.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Sales and marketing expense increased \$9.2 million comprised primarily of \$4.8 million in personnel expenses related to growth in our sales team, \$1.8 million in stock-based compensation expense, \$1.1 million in sales-related travel expenses, \$734,000 in marketing and advertising costs and \$566,000 in infrastructure-related costs.

*General and Administrative*

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
General and administrative	\$ 22,299	\$ 18,161	\$ 12,426	\$ 4,138	\$ 5,735

General and administrative expense consists primarily of personnel expenses (salaries, benefits, and other employee related costs) and stock-based compensation expense for our executive, finance, human resources and information technology personnel; legal, accounting and other professional services; travel; insurance; and an allocated portion of infrastructure costs which include, occupancy, depreciation and software costs. We expect general and administrative expense to remain relatively constant on an absolute dollar basis , except for professional fee costs which may fluctuate based on legal claims made against us.

*Year ended December 31, 2018 compared with year ended December 31, 2017*

General and administrative expense increased \$4.1 million, comprised primarily of \$1.5 million in personnel expenses from a change in headcount mix and bonus expense in the current year compared to non-achievement in the prior year, \$1.3 million in stock-based compensation expense from annual grants and \$1.4 million in third-party investigation costs in connection with a complaint filed by a former employee as described above.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

General and administrative expense increased \$5.7 million, comprised primarily of \$2.4 million in infrastructure-related costs and \$1.3 million in professional services from system implementation, both from us expanding our corporate infrastructure, and \$1.3 million in stock-based compensation expense and \$528,000 in personnel expenses from headcount growth.

*Restructuring costs*

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Restructuring costs	\$ 3,749	\$ —	\$ —	\$ 3,749	\$ —

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On February 13, 2018, we began implementing a restructuring to align our strategic and financial objectives and optimize our resources for long-term growth, including a reduction-in-force affecting approximately 9% of our employees, subleasing unused office space and closing some remote offices. As a result of the restructuring, we recorded a restructuring charge of \$ 3.7 million for the year ended December 31, 2018.

**Interest Expense**

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Interest expense	\$ 1,403	\$ 908	\$ 1,633	\$ 495	\$ (725)

Interest expense consists primarily of interest on our credit facilities and amortization of deferred financing fees associated with these facilities.

*Year ended December 31, 2018 compared with year ended December 31, 2017*

Interest expense increased \$495,000 primarily due to higher average outstanding borrowings in the current period compared to the prior period.

*Year ended December 31, 2017 compared with year ended December 31, 2016*

Interest expense decreased \$725,000 primarily due to a 1.5% interest rate reduction from our debt refinance in April 2017 and a lower principal balance on our long-term debt.

**Other Income, Net**

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Other income, net	\$ 808	\$ 508	\$ 616	\$ 300	\$ (108)

Other income, net consists of interest income earned on our cash, cash equivalents and short-term investments, remeasurement gains and losses on foreign currency and, in periods prior to our initial public offering, changes in the fair value of outstanding redeemable convertible preferred stock warrants. Changes in other income, net for both comparative periods were similar.

**Income Tax Benefit (Expense)**

(in thousands)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Income tax benefit (expense)	\$ 233	\$ 97	\$ (168)	\$ 136	\$ 265

We are subject to federal and state income taxes in the United States and foreign jurisdictions. Income tax benefit for both 2018 and 2017 was primarily due to the enactment-date effects of the Tax Cuts and Jobs Act of 2017 that included adjusting deferred tax assets and liabilities. Changes in income tax benefit (expense) for both comparative periods were similar.

**Non-GAAP Financial Measures**

Our key non-GAAP liquidity and performance measures include adjusted EBITDA and non-GAAP net income (loss), as defined below. We use adjusted EBITDA and non-GAAP net income (loss) as key measures to understand and evaluate our core operating performance and trends, to prepare and approve our annual budget and to develop short- and long-term operating plans. We believe excluding those income and expenses inherent in calculating adjusted EBITDA and non-GAAP net income (loss) can provide useful measures for period-to-period comparisons of our business. Accordingly, we believe that adjusted EBITDA and non-GAAP net income (loss) provide useful information to investors and others in understanding and evaluating our operating results in the same manner as it does for our management and board of directors. Our presentation of these non-GAAP financial measures is not meant to be considered in isolation or as a substitute for our financial results prepared in accordance with GAAP, and our non-GAAP measures may be different from non-GAAP measures used by other companies.

Adjusted EBITDA

We define adjusted EBITDA differently in this report than we have in the past, due to restructuring costs recorded in the first quarter of 2018 and independent investigation costs recorded in the third quarter of 2018. We define adjusted EBITDA as net income (loss) determined in accordance with GAAP, excluding the effects of stock-based compensation; depreciation and amortization; restructuring costs; investigation costs; other income, net; interest expense; and income tax benefit (expense). Restructuring costs relate to us initiating an effort in the first quarter 2018 to reduce headcount and sublease office space to align our strategic and financial objectives and to optimize resources for long-term growth. Investigation costs relate to third-party investigation costs incurred in relation to a complaint filed by a former employee. We have excluded from adjusted EBITDA the net restructuring and investigation costs because we do not believe they reflect our core operations.

The following table presents a reconciliation of net loss to adjusted EBITDA:

(in thousands)	Year Ended December 31,			2018 vs 2017 Change	2017 vs 2016 Change
	2018	2017	2016		
Net loss	\$ (35,231)	\$ (17,322)	\$ (1,673)	\$ (17,909)	\$ (15,649)
Adjustments:					
Other income, net	(808)	(508)	(616)	(300)	108
Interest expense	1,403	908	1,633	495	(725)
Income tax benefit (expense)	(233)	(97)	168	(136)	(265)
Depreciation and amortization	4,534	3,950	2,869	584	1,081
Stock-based compensation	11,317	7,428	2,765	3,889	4,663
Restructuring costs	3,749	—	—	3,749	—
Investigation costs	1,449	—	—	1,449	—
Adjusted EBITDA	<u>\$ (13,820)</u>	<u>\$ (5,641)</u>	<u>\$ 5,146</u>	<u>\$ (13,377)</u>	<u>\$ (10,787)</u>

Non-GAAP Net Income (Loss)

We define non-GAAP net income (loss) differently in this report than we have in the past, due to restructuring costs recorded in the first quarter of 2018 and independent investigation costs recorded in the third quarter of 2018. We define non-GAAP net income (loss) as net income (loss) determined in accordance with GAAP, excluding the effects of stock-based compensation; depreciation and amortization; restructuring costs; investigation costs (for more information about restructuring and investigation costs, please refer to the description in adjusted EBITDA above); amortization of debt issuance costs, including write-off of unamortized debt issuance costs; change in the fair value of preferred stock-warrant liability; and non-cash income tax benefit (expense). We exclude the non-cash portion of income taxes because of our ability to offset a substantial portion of future income tax liabilities by utilizing our deferred tax assets, which comprise primarily federal net-operating-loss carryforwards and federal research and experimentation credit carryforwards. We have excluded from non-GAAP net income (loss) the net restructuring and investigation costs because we do not believe they reflect our core operations.

The following table presents a reconciliation of net loss to non-GAAP net income (loss):

(in thousands, except per share data)	Year Ended December 31,			2018 vs 2017	2017 vs 2016
	2018	2017	2016	Change	Change
Net loss	\$ (35,231)	\$ (17,322)	\$ (1,673)	\$ (17,909)	\$ (15,649)
Adjustment:					
Depreciation and amortization	4,534	3,950	2,869	584	1,081
Stock-based compensation	11,317	7,428	2,765	3,889	4,663
Restructuring costs	3,749	—	—	3,749	—
Investigation costs	1,449	—	—	1,449	—
Change in the fair value of preferred stock warrant liability	—	—	(559)	—	559
Amortization of debt issuance costs, including write-off of unamortized debt issuance costs	75	95	239	(20)	(144)
Non-cash income tax expense	(404)	(231)	91	(173)	(322)
Non-GAAP net income (loss)	\$ (14,511)	\$ (6,080)	\$ 3,732	\$ (8,431)	\$ (9,812)

### Quarterly Results of Operations

The following tables set forth our unaudited quarterly statements of operations data for the last eight quarters. In the opinion of management, these data have been prepared on the same basis as the audited consolidated financial statements included elsewhere in this report, and reflects all adjustments, which include normal recurring adjustments, necessary for a fair presentation of the data. The results of historical periods are not indicative of expectations for any future period. You should read these data together with our audited consolidated financial statements and the related notes included elsewhere in this report.

	Three Months Ended							
	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
	(in thousands, except percentages)							
<b>Statements of Operations Data:</b>								
Revenue	\$ 34,618	\$ 34,405	\$ 28,542	\$ 25,068	\$ 26,863	\$ 32,599	\$ 34,111	\$ 31,727
Cost of revenue	18,307	17,857	14,882	13,306	13,854	15,606	15,940	14,959
Gross profit	16,311	16,548	13,660	11,762	13,009	16,993	18,171	16,768
Gross margin	47.1%	48.1%	47.9%	46.9%	48.4%	52.1%	53.3%	52.9%
Operating expenses:								
Research and development expense	8,998	8,804	8,363	8,003	8,912	8,846	7,119	7,343
Sales and marketing expense	8,188	7,864	8,023	8,859	9,092	8,107	7,044	7,336
General and administrative expense	5,318	6,695	5,061	5,225	4,529	4,723	4,822	4,087
Restructuring costs (benefits)	—	—	(178)	3,927	—	—	—	—
Total operating expenses	22,504	23,363	21,269	26,014	22,533	21,676	18,985	18,766
Loss from operations	(6,193)	(6,815)	(7,609)	(14,252)	(9,524)	(4,683)	(814)	(1,998)
Other income (expense), net	247	204	267	90	(55)	105	189	269
Interest expense	(433)	(390)	(351)	(229)	(4)	(223)	(307)	(374)
Loss before income taxes	(6,379)	(7,001)	(7,693)	(14,391)	(9,583)	(4,801)	(932)	(2,103)
Income tax benefit (expense)	392	(69)	(39)	(51)	249	(50)	(45)	(57)
Net loss	(5,987)	(7,070)	(7,732)	(14,442)	(9,334)	(4,851)	(977)	(2,160)
Net loss per share attributable to common stockholders — basic and diluted	\$ (0.28)	\$ (0.33)	\$ (0.36)	\$ (0.68)	\$ (0.45)	\$ (0.23)	\$ (0.05)	\$ (0.11)
Weighted-average shares used to compute net loss per shares attributable to common stockholders								
Basic	21,477	21,403	21,333	21,125	20,907	20,826	20,636	20,344
Diluted	21,477	21,403	21,333	21,125	20,907	20,826	20,636	20,344

### Seasonality

We typically renegotiate pricing with many of our endpoint IC customers with an effective date of the first quarter of the calendar year, reducing both revenue and gross margins in the first quarter when compared with prior periods. The impact tends to decline in subsequent quarters as we reduce costs and, to the extent we can migrate our customers to newer, lower-cost products, adjust product mix. Endpoint IC volumes also tend to be lower in the fourth quarter than the third quarter.

System sales tend to be stronger in the fourth quarter of the calendar year, and less strong in the first quarter. We believe this seasonality is due to the availability of residual funding for capital expenditures prior to the end of many customers' fiscal years.

While we expect these seasonal trends to continue, quarter-to-quarter variability in our revenue can be caused by a number of factors (e.g., the timing of large deployments, supply constraints, etc.) that can mask seasonality in any given year. These risks and uncertainties, as well as other risks and uncertainties that could cause our actual results to differ significantly from management's expectations, are described in greater detail in Item 1A of Part I, "Risk Factors."

## **Liquidity and Capital Resources**

As of December 31, 2018, we had cash, cash equivalents and short-term investments of \$56.1 million consisting of cash deposits held at major financial institutions and short-term investments in a variety of securities, including U.S. government agencies, corporate bonds and notes and money market funds. As of December 31, 2018, we had working capital of \$98.2 million.

Historically, we funded our operations principally through cash generated from our operations, the issuance of equity securities or the borrowing of debt under our senior credit facility. In 2018, 2017 and 2016, our principal uses of cash were funding operations, debt service payments, and capital expenditures. We believe, based on our current operating plan, that our existing cash, cash equivalents, short-term investments and available borrowings under our senior credit facility will be sufficient to meet our anticipated cash needs for at least the next 12 months.

### ***Sources of Funds***

From time to time, we may explore additional financing sources and means to lower our cost of capital, which could include equity, equity-linked and debt financing. In addition, in connection with any future acquisitions, we may pursue additional funding which may be in the form of additional debt, equity or equity-linked financing or a combination thereof. We can provide no assurance that any additional financing will be available to us on acceptable terms.

### ***Senior Credit Facility***

In March 2018, we amended our senior credit facility, to, among other things, extend the maturity date of the revolving credit facility to March 5, 2020, and provide for a new \$20.0 million term loan. We drew down \$9.0 million in term loan borrowings to refinance \$7.9 million of term loan borrowings and \$1.1 million of equipment loans and have \$11.0 million of term loan borrowings available for general corporate purposes. The new term loan will amortize over 36 months, beginning on April 1, 2019, following an initial interest-only period, and mature on March 1, 2022. We retain the ability to prepay the term loan at any time, subject to a prepayment fee equal to 2.0% of the outstanding principal amount if prepaid on or before March 5, 2019, or 1.0% of the outstanding principal amount if prepaid after March 5, 2019, but on or before March 5, 2020. The amendment also amended the financial covenants under the senior credit facility such that if our cash in accounts maintained with the lender, plus available revolver borrowings, falls below \$60.0 million for the period beginning on March 5, 2018 and ending on December 31, 2018, or \$55.0 million for the period beginning on January 1, 2019 and at all times thereafter, we must comply with an amended covenant to not exceed maximum adjusted EBITDA loss thresholds that vary by period and the existing minimum liquidity ratio, each determined in accordance with the terms of the senior credit facility.

In August 2018, we amended our senior credit facility to provide for a \$4.0 million equipment advance which we will use solely to purchase equipment. The equipment advance will amortize over 48 months, beginning September 1, 2018 and mature on August 1, 2022. We may prepay the equipment advance at any time, subject to a prepayment fee equal to 2% of the principal amount of the equipment advance if prepaid on or before August 17, 2019, or 1% of the principal amount of the equipment advance if prepaid after August 17, 2019, but on or before August 17, 2020. This amendment did not cause changes to financial covenants under the senior credit facility.

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At December 31, 2018, \$23.7 million of term loan and equipment loans were outstanding under our senior credit facility, excluding unamortized debt issuance costs of \$104,000. The blended interest rate under our senior credit facility was 6.3% at December 31, 2018.

For information on our debt facilities, please refer to Note 8 to our consolidated financial statements included elsewhere in this report.

***Use of Funds***

Our principal uses of cash are our operating expenses, inventory purchases, debt repayment and other working capital requirements.

***Historical Cash Flow Trends***

The following table shows a summary of our cash flows for the periods indicated:

(in thousands)	Year Ended December 31,		
	2018	2017	2016
Net cash used in operating activities	\$ (11,777)	\$ (35,886)	\$ (9,497)
Net cash provided by (used in) investing activities	(5,666)	21,398	(70,633)
Net cash provided by financing activities	15,688	137	103,645

***Operating Cash Flows***

For the year ended December 31, 2018, net cash used in operating activities was \$11.8 million. This cash usage was driven by a net loss (offset by non-cash adjustments) of \$20.6 million, offset by a working capital contribution of \$8.8 million. The working capital contribution was primarily due to lower cash usage in product inventory and higher cash collection in accounts receivable due to the timing of when amounts came due.

For the year ended December 31, 2017, net cash used in operating activities was \$35.9 million. This cash usage was driven by a working capital usage of \$30.1 million and a net loss (offset by non-cash adjustments) of \$5.8 million. The working capital usage was primarily due to higher cash usage in product inventory and lower cash collections in accounts receivable due to the timing of when amounts came due.

For the year ended December 31, 2016, net cash used in operating activities was \$9.5 million. This cash usage was primarily driven by a working capital usage of \$13.2 million offset by a net income (offset by non-cash adjustments) of \$3.7 million. The working capital usage was primarily due to higher cash usage in product inventory.

***Investing Cash Flows***

For the year ended December 31, 2018, net cash used in investing activities was \$5.7 million. This cash usage consisted of investments and equipment purchases of \$51.7 million and \$6.4 million, respectively. These investments and equipment purchases were partially offset by investment maturities of \$52.4 million.

For the year ended December 31, 2017, net cash provided by investing activities was \$21.4 million. This cash benefit was driven by investment maturities of \$77.1 million. These maturities were partially offset by investments and equipment purchases of \$49.1 million and \$6.6 million, respectively.

For the year ended December 31, 2016, net cash used in investing activities was \$70.6 million. This cash usage consisted of investments and equipment purchases of \$67.1 million and \$3.5 million, respectively.



### Financing Cash Flows

For the year ended December 31, 2018, net cash provided by financing activities was \$15.7 million. This cash benefit consisted of proceeds of \$16.4 million from the term loan and \$2.7 million from stock-options exercises as well as from employee stock purchases under our employee stock purchase plan. These proceeds were partially offset by repayments of indebtedness of \$2.5 million of principal under our senior credit facility and payments of \$0.9 million for capital-lease financing obligations.

For the year ended December 31, 2017, net cash provided by financing activities was \$137,000. This cash benefit consisted of proceeds of \$4.7 million from stock-options exercises and from employee stock purchases under our employee stock purchase plan. These proceeds were partially offset by payments of \$600,000 for offering costs, \$1.1 million for capital lease financing obligations, and indebtedness repayments of \$2.8 million of principal under our senior credit facility.

For the year ended December 31, 2016, net cash provided by financing activities was \$103.6 million. This cash benefit consisted of proceeds from public offerings of \$108.1 million, net of offering costs of \$10.4 million paid in 2016, offering costs of \$322,000 paid in 2015 and unpaid offering costs of \$626,000 at December 31, 2016; proceeds from borrowings of \$61.4 million; proceeds from the exercise of stock options and warrants of \$662,000; all offset by indebtedness repayments of \$65.3 million of principal under our senior credit facility and payments of \$1.2 million for capital lease financing obligations.

### Contractual Obligations

The following table reflects a summary of our contractual obligations as of December 31, 2018:

	Payments Due By Period				
	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
	(in thousands)				
Senior credit facility (1)	\$ 26,284	\$ 7,349	\$ 16,580	\$ 2,355	\$ —
Capital lease obligations	845	575	270	—	—
Operating lease obligations					
Operating lease obligations	31,953	4,661	9,432	7,913	9,947
Sublease income	(5,455)	(1,088)	(2,787)	(1,580)	—
Net operating lease commitments	26,498	3,573	6,645	6,333	9,947
Purchase commitments (2)	11,063	10,330	733	—	—
Total	\$ 64,690	\$ 21,827	\$ 24,228	\$ 8,688	\$ 9,947

(1) Senior credit facility includes estimated interest payments assuming a change in interest rates only for the conclusion of contractual interest only periods over the term of the repayment periods. As of December 31, 2018, we had principal outstanding under our senior credit facility of \$23.7 million with a blended interest rate of 6.3%.

(2) Purchase commitments consist primarily of non-cancelable commitments to purchase \$9.6 million of inventory as of December 31, 2018, as well as non-cancelable software license agreements with vendors.

### Off-Balance Sheet Arrangements

Since inception, we have not had any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or for another contractually narrow or limited purpose.

## **Critical Accounting Policies and Significant Estimates**

Our discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements which have been prepared in accordance with GAAP. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets and liabilities and related disclosure of contingent assets and liabilities, revenue and expenses at the date of the consolidated financial statements. Generally, we base our estimates on historical experience and on various other assumptions, in accordance with GAAP, that we believe to be reasonable under the circumstances. Actual results may differ from these estimates under other assumptions or conditions.

Critical accounting policies and estimates are those that we consider the most important to the portrayal of our financial condition and results of operations because they require our most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effect of matters that are inherently uncertain. Our critical accounting policies and estimates include those related to:

- revenue recognition;
- inventory;
- income taxes; and
- stock-based compensation.

### ***Revenue Recognition***

We generate revenue primarily from sales of hardware products. We also generate revenue from software, extended warranty, enhanced maintenance, support services, and nonrecurring engineering development services, all of which are not material.

We recognize revenue when control of the promised goods or services is transferred to our customers, which for hardware sales is generally at the time of product shipment as determined by the agreed-upon shipping terms. We measure revenue based on the amount of consideration we expect to be entitled-to in exchange for those goods or services. The period between when we transfer control of promised goods or services and when we receive payment is expected to be one year or less, and that expectation is consistent with our historical experience. As such, we do not adjust our revenues for the effects of a significant financing component. Any variable consideration, which consists primarily of sales incentives, is recognized as a reduction of revenue at the time of revenue recognition. Sales incentives are estimated at the time of revenue recognition and updated at the end of each reporting period as additional information becomes available.

Our reader and gateway products are highly dependent on, and interrelated with, embedded software and cannot function without this embedded software. In these cases, we account for the hardware and software license as a single performance obligation and recognize revenue at the point in time when control is transferred. Additionally, we sell standalone operating-system and other software that configures, manages and controls readers and gateways and performs other functions. This standalone software is not integrated directly in the functionality of the reader or gateway. Our software licenses, both for embedded and standalone software, provide the customer with a right to use the software as it exists when we make it available to the customer. Based on the software product, customers purchase either perpetual licenses or subscribe to licenses for a specified term, which differ mainly in the duration over which the customer benefits from the software. Consequently, we recognize revenue for standalone software at the point in time when the software is made available to the customer.

Our contracts with customers with multiple performance obligations generally include a combination of hardware products, standalone software, extended warranty and enhanced maintenance and support services. For these contracts, we account for individual performance obligations separately if they are distinct. The transaction price is allocated to the separate performance obligations on a relative standalone selling-price basis. In instances where the standalone selling price is not directly observable, such as when we do not sell the product or service separately, we determine the standalone selling price using one, or a combination of, the adjusted market assessment or expected cost-plus margin. Amounts allocated to extended warranty and enhanced maintenance sold with our reader and gateway products are deferred and recognized on a straight-line basis over the term of the arrangement, which is typically from one to three years. Amounts allocated to support services sold with our reader and gateway products are deferred and recognized when control of the promised services is transferred to our customers.

For nonrecurring engineering development agreements that involve significant production, modification or customization of our products, we generally recognize revenue over the performance period using the cost-input method because it best depicts the transfer of services to the customer. We receive payments under these agreements based on a billing schedule. Contract assets relate to our conditional right to consideration for our completed performance under these agreements. Accounts receivable are recorded when the right to consideration becomes unconditional. Contract liability, or deferred revenue relates to payments received in advance of performance under the contract. Contract liabilities are recognized as revenue as we perform under the contract. For the periods presented in this report, our contract assets, deferred revenue and the value of unsatisfied performance obligations for nonrecurring engineering development agreements are not material.

Payment terms range from 30 to 120 days. We present revenue net of sales tax in our consolidated statements of operations. Shipping charges billed to customers are included in revenue and the related shipping costs are included in cost of revenue.

*Practical Expedients and Exemptions:* We generally expense sales commissions when incurred because the amortization period would have been one year or less. These costs are recorded within sales and marketing expenses. We do not disclose the value of unsatisfied performance obligations for (1) contracts with an original expected length of one year or less and (2) contracts for which we recognize revenue at the amount to which we have the right to invoice for services performed.

### ***Inventory***

Inventory consists of raw materials, work-in-progress and finished goods and is stated at the lower of cost or net realizable value. Cost is determined using the average costing method, which approximates the first-in, first-out method. We establish reserves for excess and obsolete inventory based on our analysis of inventory levels and future sales demand and market conditions. We charge inventory reserves to write down our inventory through cost of revenue. Estimating the value of our inventory requires considerable judgment. Changes in our estimates and assumptions could have a material impact on our results of operations, financial position and cash flows.

We recorded inventory excess and obsolescence charges for the year ended December 31, 2018, which had an unfavorable net impact of 1.2% on our gross margin for 2018. The inventory excess and obsolescence charges were primarily related to European Commission approval of RAIN spectrum expansion, which may slow demand for existing EU reader and gateway products that do not leverage the additional spectrum. Inventory excess and obsolescence charges were not material for the years ended December 31, 2017 and 2016.

### ***Income Taxes***

We use the asset and liability approach for accounting, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the financial statement and tax bases. Deferred tax assets and liabilities are measured using enacted tax rates expected to be in effect when such assets and liabilities are recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the year that includes the enactment date. We determine deferred tax assets, including historical net operating losses, and deferred tax liabilities, based on temporary differences between the book and tax bases of assets and liabilities. We believe that it is currently more likely than not that our deferred tax assets will not be realized and as such, we have recorded a full valuation allowance for these assets. We evaluate the likelihood of the ability to realize deferred tax assets in future periods on a quarterly basis, and when appropriate evidence indicates we would release our valuation allowance accordingly.

We utilize a two-step approach for evaluating uncertain tax positions. First, we evaluate recognition, which requires us to determine if the weight of available evidence indicates that a tax position is more likely than not to be sustained upon audit, including resolution of related appeals or litigation processes. If a tax position is not considered more likely than not to be sustained, no benefits of the position are recognized. Second, we measure the uncertain tax position based on the largest amount of benefit which is more likely than not to be realized on effective settlement. This process involves estimating our actual current tax exposure, including assessing the risks associated with tax audits, together with assessing temporary differences resulting from the different treatment of items for tax and financial reporting purposes. If actual results differ from our estimates, our net operating loss and credit carryforwards could be materially impacted.

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Our realization of the benefits of the NOLs and credit carryforwards depends on sufficient taxable income in future years. We have established a valuation allowance against the carrying value of our deferred tax assets, as it is currently more likely than not that we will not be able to realize these deferred tax assets. In addition, using NOLs and credits to offset future income subject to taxes may be subject to substantial annual limitations due to the “change in ownership” provisions of the Code and similar state provisions. Events that cause limitations in the amount of NOLs that we may use in any one year include, but are not limited to, a cumulative ownership change of more than 50%, as defined by Code Sections 382 and 383, over a three-year period. Utilization of our NOLs and tax credit carryforwards could be significantly reduced if a cumulative ownership change of more than 50% has occurred in our past or occurs in our future.

We do not anticipate that the amount of our existing unrecognized tax benefits will significantly increase or decrease within the next 12 months. Due to the presence of NOLs in most jurisdictions, our tax years remain open for examination by taxing authorities back to 2000.

### ***Stock-Based Compensation***

We measure stock-based compensation cost on the grant date, based on the estimated fair value of the award using the Black-Scholes option-pricing model and recognized as an expense over the employee’s requisite service period on a straight-line basis. We expect to continue to grant stock awards pursuant to our 2016 Equity Incentive Plan and to allow employees to purchase shares of our common stock pursuant to our 2016 Employee Stock Purchase Plan.

We account for stock-based compensation arrangements with non-employees using a fair value approach. The compensation costs of these arrangements are subject to remeasurement over the vesting terms as earned.

Prior to the closing of our initial public offering, we granted stock options at exercise prices believed to be equal to the fair value of the common stock underlying such options as determined by the board of directors, with input from management, on the date of grant. Because such grants occurred prior to the public trading of our common stock, the board of directors exercised significant judgment in determining the fair market value of our common stock. The valuations were consistent with the guidance and methods outlined in the AICPA Practice Aid, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*, or AICPA Practice Aid, for all option grant dates. After the closing of the initial public offering, we granted stock options with exercise prices based on market prices.

Our Black-Scholes option-pricing model requires us to use highly subjective assumptions, including the expected volatility of the price of our common stock, the expected term of the award, risk-free interest rates, the expected dividend yield of our common stock and, for the period prior to our IPO, the fair value of the underlying common stock. These estimates involve inherent uncertainties and the application of management’s judgment. If factors change and, as a consequence, we must use different assumptions than our stock-based compensation expense could be materially different in the future.

### **Recent Accounting Pronouncements**

For information on recent accounting pronouncements, please refer to Note 2 to our consolidated financial statements included elsewhere in this report.

### **JOBS Act**

We are an emerging growth company under the JOBS Act. The JOBS Act provides that an emerging growth company can delay adoption of new or revised accounting pronouncements applicable to public companies until such pronouncements are made applicable to private companies, unless we otherwise irrevocably elect not to avail itself of this exemption. While we have not made such an irrevocable election, we have not delayed the adoption of any applicable accounting standards.

Subject to certain conditions set forth in the JOBS Act, if, as an “emerging growth company,” we choose to rely on certain exemptions provided for in the JOBS Act we may not be required to, among other things, (1) provide an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404, (2) provide all of the compensation disclosure that may be required of non-emerging growth public companies under the Dodd-Frank Wall Street Reform and Consumer Protection Act, (3) comply with any requirement that may be adopted by the PCAOB regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements (auditor discussion and analysis) and (4) disclose certain executive compensation related items such as the correlation between executive compensation and performance, and comparisons of the CEO’s compensation to median employee compensation. These exemptions will apply for a period of five years following the completion of our initial public offering or until we are no longer an “emerging growth company,” whichever is earlier.

#### **Item 7A. Quantitative and Qualitative Disclosures About Market Risk**

We are exposed to market risks in the ordinary course of our business. These risks primarily consist of fluctuations in interest rates.

##### ***Interest Rate Risk***

Under our current investment policy, we invest our excess cash in money market funds, U.S. government agency securities, corporate bonds and notes and commercial paper. Our current investment policy seeks first to preserve principal, second to provide liquidity for our operating and capital needs and third to maximize yield without putting our principal at risk. We do not enter into investments for trading or speculative purposes.

We had cash, cash equivalents and short-term investments of \$56.1 million and \$58.1 million as of December 31, 2018 and 2017, respectively. Our investments are exposed to market risk due to fluctuations of prevailing interest rates, that may reduce the yield on our investments or their fair value. Because our investment portfolio is short-term in nature, we do not believe an immediate 10% increase in interest rates would have a material effect on the fair market value of our portfolio, and therefore we do not expect our results of operations or cash flows to be materially affected by a sudden change in market interest rates.

We are subject to interest rate risk in connection with the borrowings under our senior credit facility, which accrue interest at variable rates. As of December 31, 2018, our borrowings under our senior credit facility had a blended rate of 6.3%. A hypothetical 100 basis-point increase in interest rates would result in an additional \$407,000 in interest expense until the scheduled maturity date in 2022.

##### ***Inflation Risk***

We do not believe that inflation has had a material effect on our business, financial condition or results of operations. If our costs were to become subject to significant inflationary pressures, we may not be able to fully offset such higher costs through price increases. Our inability or failure to do so could adversely affect our business, financial condition and results of operations.

##### ***Foreign Currency Exchange Risk***

Our foreign subsidiaries are considered to be extensions of the U.S. Company. The functional currency of the foreign subsidiaries is the U.S. dollar. Accordingly, gains and losses resulting from remeasuring transactions denominated in currencies other than U.S. dollars are included in other income, net on the consolidated statements of operations. For any of the periods presented, we did not have material impact from exposure to foreign currency fluctuation. As we grow operations, our exposure to foreign currency risk will likely become more significant.

**Item 8. Financial Statements and Supplementary Data**

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The supplementary financial information required by this Item 8 is included in Item 7 under the caption "Quarterly Results of Operations."

**Report of Independent Registered Public Accounting Firm**

To the Board of Directors and Stockholders of Impinj, Inc.

***Opinion on the Financial Statements***

We have audited the accompanying consolidated balance sheets of Impinj, Inc. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of operations, of comprehensive loss, of changes in redeemable convertible preferred stock, of changes in stockholders’ equity (deficit) and of cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America.

***Basis for Opinion***

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits of these consolidated financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion..

/s/ PricewaterhouseCoopers LLP  
Seattle, Washington  
February 28, 2019

We have served as the Company’s auditor since 2003.

**Impinj, Inc.**  
**Consolidated Balance Sheets**  
(in thousands, except par value)

	December 31, 2018	December 31, 2017
<b>Assets:</b>		
Current assets:		
Cash and cash equivalents	\$ 17,530	\$ 19,285
Short-term investments	38,543	38,831
Accounts receivable, net of allowances of \$551 and \$3,625 at December 31, 2018 and 2017, respectively	18,462	22,244
Inventory	44,725	47,083
Prepaid expenses and other current assets	1,954	2,359
Total current assets	<u>121,214</u>	<u>129,802</u>
Property and equipment, net	19,778	18,110
Other non-current assets	196	241
Goodwill	3,881	3,881
Total assets	<u>\$ 145,069</u>	<u>\$ 152,034</u>
<b>Liabilities and stockholders' equity:</b>		
Current liabilities:		
Accounts payable	\$ 4,643	\$ 4,666
Accrued compensation and employee related benefits	7,409	5,729
Accrued liabilities	2,887	3,162
Current portion of restructuring liabilities	582	—
Current portion of long-term debt	5,930	4,088
Current portion of capital lease obligations	523	936
Current portion of deferred rent	402	628
Current portion of deferred revenue	649	714
Total current liabilities	<u>23,025</u>	<u>19,923</u>
Long-term debt, net of current portion	17,633	5,500
Capital lease obligations, net of current portion	258	745
Long-term liabilities — other	304	532
Long-term restructuring liabilities	487	—
Deferred rent, net of current portion	5,294	5,891
Deferred revenue, net of current portion	185	501
Total liabilities	<u>47,186</u>	<u>33,092</u>
Commitments and contingencies (Note 10)		
<b>Stockholders' equity:</b>		
Preferred stock, \$0.001 par value — 5,000 shares authorized, no shares issued and outstanding at December 31, 2018 and 2017	—	—
Common stock, \$0.001 par value — 495,000 shares authorized, 21,492 and 20,973 shares issued and outstanding at December 31, 2018 and 2017, respectively	21	21
Additional paid-in capital	337,627	323,482
Accumulated other comprehensive loss	(9)	(36)
Accumulated deficit	(239,756)	(204,525)
Total stockholders' equity	<u>97,883</u>	<u>118,942</u>
Total liabilities and stockholders' equity	<u>\$ 145,069</u>	<u>\$ 152,034</u>

The accompanying notes are an integral part of these consolidated financial statements .



**Impinj, Inc.**  
**Consolidated Statements of Operations**  
(in thousands, except per share data)

	Year Ended December 31,		
	2018	2017	2016
Revenue	\$ 122,633	\$ 125,300	\$ 112,287
Cost of revenue	64,352	60,359	52,834
Gross profit	58,281	64,941	59,453
Operating expenses:			
Research and development expense	34,168	32,220	25,185
Sales and marketing expense	32,934	31,579	22,330
General and administrative expense	22,299	18,161	12,426
Restructuring costs	3,749	—	—
Total operating expenses	93,150	81,960	59,941
Loss from operations	(34,869)	(17,019)	(488)
Other income, net	808	508	616
Interest expense	(1,403)	(908)	(1,633)
Loss before income taxes	(35,464)	(17,419)	(1,505)
Income tax benefit (expense)	233	97	(168)
Net loss	<u>\$ (35,231)</u>	<u>\$ (17,322)</u>	<u>\$ (1,673)</u>
Less: Accretion of preferred stock	—	—	(6,258)
Net loss attributable to common stockholders	<u>\$ (35,231)</u>	<u>\$ (17,322)</u>	<u>\$ (7,931)</u>
Net loss per share attributable to common stockholders — basic and diluted	<u>\$ (1.65)</u>	<u>\$ (0.84)</u>	<u>\$ (0.74)</u>
Weighted-average shares outstanding — basic and diluted	<u>21,334</u>	<u>20,680</u>	<u>10,778</u>

The accompanying notes are an integral part of these consolidated financial statements.

**Impinj, Inc.**  
**Consolidated Statements of Comprehensive Loss**  
(in thousands)

	<b>Year Ended December 31,</b>		
	<b>2018</b>	<b>2017</b>	<b>2016</b>
Net loss	\$ (35,231)	\$ (17,322)	\$ (1,673)
Other comprehensive income (loss), net of tax:			
Unrealized gain (loss) on investments	27	(26)	(10)
Total other comprehensive income (loss)	27	(26)	(10)
Comprehensive loss	<u>\$ (35,204)</u>	<u>\$ (17,348)</u>	<u>\$ (1,683)</u>

The accompanying notes are an integral part of these consolidated financial statements.

**Impinj, Inc.**  
**Consolidated Statements of Changes in Redeemable Convertible Preferred Stock**  
(in thousands)

	Series 1		Series 2		Total
	Shares	Amount	Shares	Amount	Amount
<b>Balance at December 31, 2015</b>	5,334	\$ 60,184	2,552	\$ 37,779	\$ 97,963
Accretion of redeemable convertible preferred stock	—	6,258	—	—	6,258
Issuance of preferred stock upon exercise of preferred stock warrants	—	—	106	1,863	1,863
Conversion of preferred stock into common stock at initial public offering	(5,334)	(66,442)	(2,658)	(39,642)	(106,084)
<b>Balance at December 31, 2016</b>	—	—	—	—	—
<b>Balance at December 31, 2017</b>	—	—	—	—	—
<b>Balance at December 31, 2018</b>	—	\$ —	—	\$ —	\$ —

The accompanying notes are an integral part of these consolidated financial statements.

**Impinj, Inc.**  
**Consolidated Statements of Changes in Stockholders' Equity (Deficit)**  
(in thousands)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity (Deficit)
	Shares	Amount				
<b>Balance at December 31, 2015</b>	4,382	\$ 4	\$ 100,276	\$ (185,315)	\$ —	\$ (85,035)
Issuance of common stock	197	—	453	—	—	453
Stock-based compensation	—	—	2,765	—	—	2,765
Accretion of preferred stock	—	—	(6,258)	—	—	(6,258)
Conversion of preferred stock warrants into common stock warrants at initial public offering	—	—	505	—	—	505
Common stock issued in connection with net exercises of common stock warrants	55	—	—	—	—	—
Conversion of preferred stock into common stock at initial public offering	8,655	9	106,075	—	—	106,084
Issuance of common stock from public offerings, net of issuance costs	7,047	7	107,185	—	—	107,192
Net cumulative effect adjustment upon adoption of share-based payment guidance to account for forfeitures as they occur	—	—	215	(215)	—	—
Net loss	—	—	—	(1,673)	—	(1,673)
Other comprehensive loss	—	—	—	—	(10)	(10)
<b>Balance at December 31, 2016</b>	20,336	20	311,216	(187,203)	(10)	124,023
Issuance of common stock	637	1	4,838	—	—	4,839
Stock-based compensation	—	—	7,428	—	—	7,428
Net loss	—	—	—	(17,322)	—	(17,322)
Other comprehensive loss	—	—	—	—	(26)	(26)
<b>Balance at December 31, 2017</b>	20,973	21	323,482	(204,525)	(36)	118,942
Issuance of common stock	519	—	2,828	—	—	2,828
Stock-based compensation	—	—	11,317	—	—	11,317
Net loss	—	—	—	(35,231)	—	(35,231)
Other comprehensive income	—	—	—	—	27	27
<b>Balance at December 31, 2018</b>	<u>21,492</u>	<u>\$ 21</u>	<u>\$ 337,627</u>	<u>\$ (239,756)</u>	<u>\$ (9)</u>	<u>\$ 97,883</u>

The accompanying notes are an integral part of these consolidated financial statements.

**Impinj, Inc.**  
**Consolidated Statements of Cash Flows**  
(in thousands)

	<b>Year Ended December 31,</b>		
	<b>2018</b>	<b>2017</b>	<b>2016</b>
<b>Operating activities:</b>			
Net loss	\$ (35,231)	\$ (17,322)	\$ (1,673)
Adjustment to reconcile net loss to net cash used in operating activities:			
Depreciation	4,534	3,950	2,869
Stock-based compensation	11,317	7,428	2,765
Non-cash restructuring benefit	(454)	—	—
Accretion of discount or amortization of premium on short-term investments	(419)	70	31
Revaluation of warrant liability	—	—	(559)
Amortization and write-off of debt issuance costs	75	95	239
Deferred income taxes	(395)	—	—
Changes in operating assets and liabilities:			
Accounts receivable	3,782	(4,822)	(4,515)
Inventory	2,358	(19,349)	(15,897)
Prepaid expenses and other assets	473	439	(1,759)
Deferred revenue	(381)	(196)	17
Deferred rent	(260)	1,191	86
Accounts payable	326	(2,836)	3,883
Accrued compensation and employee related benefits	1,819	(1,735)	3,462
Accrued liabilities	(390)	(2,799)	1,554
Restructuring liabilities	1,069	—	—
Net cash used in operating activities	<u>(11,777)</u>	<u>(35,886)</u>	<u>(9,497)</u>
<b>Investing activities:</b>			
Purchases of investments	(51,651)	(49,125)	(67,103)
Proceeds from maturities of investments	52,352	77,075	—
Purchases of property and equipment	(6,367)	(6,552)	(3,530)
Net cash provided by (used in) investing activities	<u>(5,666)</u>	<u>21,398</u>	<u>(70,633)</u>
<b>Financing activities:</b>			
Proceeds from public offerings, net of offering costs	—	—	108,096
Payments on capital lease financing obligations	(900)	(1,147)	(1,229)
Payments on term loans	(2,451)	(2,772)	(65,320)
Proceeds from term loans, net of debt issuance costs	16,350	—	61,436
Proceeds from exercise of stock options and employee stock purchase plan	2,689	4,656	600
Proceeds from exercise of warrants	—	—	62
Payments of deferred offering costs	—	(600)	—
Net cash provided by financing activities	<u>15,688</u>	<u>137</u>	<u>103,645</u>
Net increase (decrease) in cash and cash equivalents	(1,755)	(14,351)	23,515
<b>Cash and cash equivalents</b>			
Beginning of period	19,285	33,636	10,121
End of period	<u>\$ 17,530</u>	<u>\$ 19,285</u>	<u>\$ 33,636</u>
<b>Supplemental disclosure of cash flow information:</b>			
Cash paid for interest	\$ 1,179	\$ 814	\$ 1,503
<b>Supplemental disclosure of non-cash financing and investing activities:</b>			
Accretion on preferred stock	\$ —	\$ —	\$ 6,258
Vesting of early exercise stock options	139	183	167
Additions to property and equipment through capital lease	—	—	341
Accrued not yet paid offering costs	—	—	626
Purchases of property and equipment not yet paid	513	579	1,538
Write-off of fully depreciated property and equipment	3,105	592	1,571
Conversion of convertible preferred stock to common stock	—	—	106,084
Conversion of convertible preferred stock warrants to common stock warrants	—	—	505

The accompanying notes are an integral part of these consolidated financial statements.

**IMPINJ, INC.**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

**Note 1. Description of Business**

Impinj, Inc., a Delaware corporation, is headquartered in Seattle, Washington. Impinj enables wireless connectivity for everyday items, delivering each item's unique identity, location and authenticity to business and consumer applications. Impinj's platform spans endpoints, connectivity and software and provides wireless item connectivity and information delivery. Impinj derives revenue from selling endpoint ICs, reader ICs, modules, readers, gateways and software as well as from development, service and license agreements. Our integrated platform connects billions of everyday items to applications, delivering real-time information to businesses about items they create, manage, transport and sell.

**Note 2. Summary of Significant Accounting Policies**

***Basis of Presentation and Principles of Consolidation***

The accompanying consolidated financial statements include Impinj, Inc. and its wholly owned subsidiaries. Intercompany balances and transactions have been eliminated in consolidation. These consolidated financial statements have been prepared in conformity with U.S. generally accepted accounting principles, or GAAP.

***Public Offerings***

On July 26, 2016, we closed our initial public offering of 5,520,000 shares of common stock at an initial price to the public of \$14.00 per share, including 720,000 shares of common stock pursuant to the underwriters' option to purchase additional shares, resulting in aggregate net proceeds to us of \$68.5 million after deducting underwriting discounts and commissions and offering costs. Upon the effectiveness of the registration statement related to the initial public offering on July 20, 2016, all of our outstanding shares of redeemable convertible preferred stock and outstanding preferred stock warrants, which automatically net exercised, converted into 8,531,146 shares and 123,759 shares, respectively, of common stock. The related carrying value of the redeemable convertible preferred stock and warrants of \$106.1 million and \$505,000, respectively, were reclassified to common stock and additional paid-in capital.

On December 7, 2016, we closed our follow-on public offering of 1,527,380 shares of common stock at a price to the public of \$27.00 per share, resulting in aggregate net proceeds to us of \$38.7 million after deducting underwriting discounts and commissions and offering costs.

***Reverse Stock Split***

On June 16, 2016, our board of directors and stockholders approved an amendment to our certificate of incorporation to effect a reverse split of shares of our authorized, issued and outstanding common stock and redeemable convertible preferred stock at a 1-for-12 ratio. The reverse stock split was effected on July 8, 2016. The par value of our common stock and the par value of our redeemable convertible preferred stock were not adjusted as a result of the reverse stock split. All authorized, issued and outstanding shares of common stock and redeemable convertible preferred stock, warrants for common stock and redeemable convertible preferred stock, options to purchase common stock and the related per share amounts contained in these consolidated financial statements have been retroactively adjusted to reflect this reverse stock split for all periods presented.

***Offering Costs***

Offering costs, consisting of legal, accounting and other fees and costs related to our public offerings, were capitalized. Total offering costs of approximately \$4.1 million were deferred through the completion of the public offerings and upon closing of each of the public offerings in 2016 were reclassified to additional paid-in capital as a reduction of the proceeds. There were no deferred offering costs as of December 31, 2018 and 2017.

**Use of Estimates**

The preparation of financial statements in conformity with GAAP requires management to make certain estimates, judgments and assumptions that affect the reported amounts of assets and liabilities and the related disclosures at the date of the financial statements, as well as the reported amounts of revenue and expenses during the periods presented. On an ongoing basis, we evaluate our estimates, including those related to revenue recognition, reserve for sales returns, collectability of accounts receivable, estimated costs to complete development contracts, warranty obligations, deferred revenue, sales incentives, inventory excess and obsolescence, depreciable lives of fixed assets, the determination of the fair value of stock awards and compensation and employee related benefits. To the extent there are material differences between these estimates, judgments, or assumptions and actual results, our financial statements will be affected.

**Concentrations of Credit Risk**

Financial instruments, which potentially subject us to concentrations of credit risk, consist primarily of cash equivalents, investments and accounts receivable. We place cash and cash equivalents and investments with major financial institutions, which management assesses to be of high credit quality, in order to limit exposure of our investments. We extend credit to customers based upon an evaluation of the customer's financial condition and generally collateral is not required. The following table presents total revenue and accounts receivable concentration for the periods presented or as of the dates presented:

	Year Ended December 31,		
	2018	2017	2016
<b>Revenue:</b>			
Avery Dennison	22%	18%	14%
Smartrac	17	14	16
Arizon	10	13	11
Shang Yang	*	*	10
Blue Star	*	10	*
	49%	55%	51%

\* Less than 10%

	As of December 31,	
	2018	2017
<b>Accounts Receivable:</b>		
Smartrac	21%	17%
Avery Dennison	14	*
Blue Star	13	11
Arizon	10	*
Shang Yang	*	10
Invengo	*	10
	58%	48%

\* Less than 10%

**Concentration of Supplier Risk**

We outsource the manufacturing and production of our hardware products to a limited number of suppliers. Although there are a limited number of manufacturers for hardware products, we believe that other suppliers could provide similar products on comparable terms. A change in suppliers, however, could cause a delay in manufacturing and a possible loss of sales, which would adversely affect our operating results.

**Cash and Cash Equivalents**

Cash includes demand deposits with banks or financial institutions. Cash equivalents include short-term, highly liquid investments that are both readily convertible to known amounts of cash and so near their maturity that

they present minimal risk of changes in value because of changes in interest rates. Our cash equivalents include only investments with an original or remaining maturity of three months or less at the date of purchase. We regularly maintain cash in excess of federally insured limits at financial institutions.

### ***Investments***

Our investments consist of fixed income securities, which include U.S. government agency securities, corporate notes and bonds and commercial paper. As the investments are available to support current operations, contractual maturities of our available-for-sale securities are due in one year or less and are classified as short-term investments. Available-for-sale securities are carried at fair value with unrealized gains and losses reported as a component of accumulated other comprehensive income (loss) in stockholders' equity, while realized gains and losses and other-than-temporary impairments are reported as a component of net income (loss) based on specific identification. An impairment charge is recorded in the consolidated statements of operations for declines in fair value below the cost of an individual investment that are deemed to be other than temporary. We assess whether a decline in value is temporary based on the length of time that the fair market value has been below cost, the severity of the decline and the intent and ability to hold or sell the investment. The gross unrealized gains or losses on short-term investments as of December 31, 2018 and 2017 were not material. We did not identify any investments as other-than-temporarily impaired as of December 31, 2018 or 2017.

### ***Fair Value Measurement***

Accounting standards define fair value as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market in an orderly transaction between market participants on the measurement date. The standards also establish a fair value hierarchy, which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. There are three levels of inputs that may be used to measure fair value:

- Level 1 — Quoted prices in active markets for identical assets or liabilities.
- Level 2 — Assets and liabilities valued based on observable market data for similar instruments, such as quoted prices for similar assets or liabilities.
- Level 3 — Unobservable inputs that are supported by little or no market activity; instruments valued based on the best available data, some of which is internally developed, and considers risk premiums that a market participant would require.

We applied the following methods and assumptions in estimating our fair value measurements:

*Cash equivalents* — Cash equivalents are comprised of highly liquid investments, including money market funds and certificates of deposit, with an original or remaining maturity of three months or less at the date of purchase. The fair value measurement of these assets is based on quoted market prices in active markets.

*Investments* — Our investments consist of fixed income securities, which include U.S. government agency securities, corporate notes and bonds, commercial paper and treasury bills. The fair value measurement of these assets is based on observable market-based inputs or inputs that are derived principally from or corroborated by observable market data by correlation or other means.

*Long-term debt* — The fair values of our long-term debt approximates carrying value based on the borrowing rates currently available to us for loans with similar terms using Level 2 inputs.

### ***Accounts Receivable and Allowances***

Accounts receivable consists of amounts billed currently due from customers and amounts earned not yet billed on development agreements, net of an allowance for doubtful accounts, an allowance for sales returns and an allowance for price exceptions.



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The allowance for doubtful accounts is our best estimate of the amount of probable credit losses in existing accounts receivable and is determined based on our historical collections experience, age of the receivable, knowledge of the customer and the condition of the general economy and industry as a whole. We record changes in our estimate to the allowance for doubtful accounts through bad debt expense and write off the receivable and corresponding allowance when accounts are ultimately determined to be uncollectible. Bad debt expense is included in general and administrative expenses. For the periods presented in this report, bad debt expense was not material.

The allowance for sales returns is our best estimate based on historical experience and currently available evidence. We record changes in our estimate to the allowance for sales returns through revenue and relieve the allowance when product returns are received. In 2017, we reserved for \$3.2 million related to a product exchange that we completed in the first quarter of 2018. The following table summarizes our allowance for sales returns (in thousands):

	<u>Balance at Beginning of Year</u>	<u>Additional Reserve</u>	<u>Applied Sales Return</u>	<u>Balance at End of Year</u>
<b>Allowance for sales returns:</b>				
During year ended December 31, 2018	\$ 3,282	\$ 34	\$ (3,249)	\$ 67
During year ended December 31, 2017	63	3,250	(31)	3,282
During year ended December 31, 2016	128	—	(65)	63

The allowance for price concession is our best estimate based on historical experience. For the periods presented, price concession are not material and are not included in the table above.

### ***Inventory***

Inventory consists of raw materials, work-in-progress and finished goods and is stated at the lower of cost or net realizable value. Cost is determined using the average costing method, which approximates the first-in, first-out method. We establish reserves for excess and obsolete inventory based on our analysis of inventory levels and future sales demand and market conditions. We charge inventory reserve to write down our inventory through cost of revenue. Estimating the value of our inventory requires considerable judgment. Changes in our estimates and assumptions could have a material impact on our results of operations, financial position and cash flows.

We recorded inventory excess and obsolescence charges for the year ended December 31, 2018, which had an unfavorable net impact of 1.2% on our gross margin for 2018. The inventory excess and obsolescence charges were primarily related to European Commission approval of RAIN spectrum expansion, which may slow demand for existing EU reader and gateway products that do not leverage the additional spectrum. Inventory excess and obsolescence charges were not material for the years ended December 31, 2017 and 2016.

### ***Property and Equipment***

Property and equipment is recorded at cost and depreciated using the straight-line method over the estimated useful lives of the related assets. The useful lives are as follows:

<u>Category</u>	<u>Useful Life</u>
Laboratory equipment	2 to 5 years
Computer equipment and software	2 to 5 years
Furniture and fixtures	3 to 7 years
Equipment acquired under capital leases	3 to 7 years
Leasehold improvements	Shorter of lease term or expected useful life

Maintenance and repair costs are charged to expense as incurred. Major improvements, which extend the useful life of the related asset, are capitalized. Upon disposal of a fixed asset, we record a gain or loss based on the differences between the proceeds received and the net book value of the disposed asset.

### ***Goodwill***

Goodwill is measured as the excess of the cost of acquisition over the sum of the amounts assigned to identifiable tangible and intangible assets acquired less liabilities assumed. We perform an annual impairment assessment of goodwill at the reporting unit level as of September 30, or more frequently if indicators of potential impairment exist. Our annual impairment assessment requires a comparison of the fair value of our reporting unit to the carrying value. If the fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired. If the carrying value of a reporting unit is greater than its fair value, an impairment loss will be recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit. Additionally, we will consider the income tax effect from any tax deductible goodwill on the carrying amount of the reporting unit when measuring the goodwill impairment loss.

### ***Revenue Recognition***

We generate revenue primarily from sales of hardware products. We also generate revenue from software, extended warranty, enhanced maintenance, support services, and nonrecurring engineering development services, all of which are not material.

We recognize revenue when control of the promised goods or services is transferred to our customers, which for hardware sales is generally at the time of product shipment as determined by the agreed-upon shipping terms. We measure revenue based on the amount of consideration we expect to be entitled to in exchange for those goods or services. The period between when we transfer control of promised goods or services and when we receive payment is expected to be one year or less, and that expectation is consistent with our historical experience. As such, we do not adjust our revenues for the effects of a significant financing component. Any variable consideration, which consists primarily of sales incentives, is recognized as a reduction of revenue at the time of revenue recognition. Sales incentives are estimated at the time of revenue recognition and updated at the end of each reporting period as additional information becomes available.

Our reader and gateway products are highly dependent on, and interrelated with, embedded software and cannot function without this embedded software. In these cases, we account for the hardware and software license as a single performance obligation and recognize revenue at the point in time when control is transferred. Additionally, we sell standalone operating system and other software that configures, manages and controls readers and gateways and performs other functions. This standalone software is not integrated directly in the functionality of the reader or gateway. Our software licenses, both for embedded and standalone software, provide the customer with a right to use the software as it exists when we make it available to the customer. Based on the software product, customers purchase either perpetual licenses or subscribe to licenses for a specified term, which differ mainly in the duration over which the customer benefits from the software. Consequently, we recognize revenue for standalone software at the point in time when the software is made available to the customer.

Our contracts with customers with multiple performance obligations generally include a combination of hardware products, standalone software, extended warranty and enhanced maintenance and support services. For these contracts, we account for individual performance obligations separately if they are distinct. The transaction price is allocated to the separate performance obligations on a relative standalone selling-price basis. In instances where the standalone selling price is not directly observable, such as when we do not sell the product or service separately, we determine the standalone selling price using one, or a combination of, the adjusted market assessment or expected cost-plus margin. Amounts allocated to extended warranty and enhanced maintenance sold with our reader and gateway products are deferred and recognized on a straight-line basis over the term of the arrangement, which is typically from one to three years. Amounts allocated to support services sold with our reader and gateway products are deferred and recognized when control of the promised services is transferred to our customers.

For nonrecurring engineering development agreements that involve significant production, modification or customization of our products, we generally recognize revenue over the performance period using the cost-input method because it best depicts the transfer of services to the customer. We receive payments under these agreements based on a billing schedule. Contract assets relate to our conditional right to consideration for our completed performance under these agreements. Accounts receivable are recorded when the right to consideration becomes unconditional. Contract liability, or deferred revenue, relates to payments received in advance of performance under the contract. Contract liabilities are recognized as revenue as we perform under the contract. For the periods presented in this report, our contract assets, deferred revenue and the value of unsatisfied performance obligations for nonrecurring engineering development agreements are not material.

Payment terms range from 30 to 120 days. We present revenue net of sales tax in our consolidated statements of operations. Shipping charges billed to customers are included in revenue and the related shipping costs are included in cost of revenue.

*Practical Expedients and Exemptions:* We generally expense sales commissions when incurred because the amortization period would have been one year or less. These costs are recorded within sales and marketing expenses. We do not disclose the value of unsatisfied performance obligations for (1) contracts with an original expected length of one year or less and (2) contracts for which we recognize revenue at the amount to which we have the right to invoice for services performed.

#### ***Product Warranties***

We provide limited warranty coverage for most products, generally ranging from a period of 90 days to one year from the date of shipment. A liability is recorded for the estimated cost of product warranties based on historical claims, product failure rates and other factors when the related revenue is recognized. We review these estimates periodically and adjust the warranty reserves as actual experience differs from historical estimates or other information becomes available. The warranty liability primarily includes the anticipated cost of materials, labor and shipping necessary to repair or replace the product. Accrued warranty costs in 2018 and 2017 were not material.

#### ***Research and Development Costs***

Research and development expense consists primarily of salaries, related benefits expense and stock-based compensation expense for our product development personnel; external consulting and service costs; prototype materials; other new product development costs; and an allocated portion of infrastructure costs which include, occupancy, depreciation and software costs.

#### ***Foreign Currency***

Our foreign subsidiaries are considered to be extensions of the U.S. Company. The functional currency of the foreign subsidiaries is the U.S. dollar. Accordingly, gains and losses resulting from remeasuring transactions denominated in currencies other than U.S. dollars are included in other income, net on the consolidated statements of operations.

#### ***Income Taxes***

We use the asset and liability approach for accounting, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the financial statement and tax bases. Deferred tax assets and liabilities are measured using enacted tax rates expected to be in effect when such assets and liabilities are recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the year that includes the enactment date. We determine deferred tax assets, including historical net operating losses, and deferred tax liabilities, based on temporary differences between the book and tax bases of assets and liabilities. We evaluate the likelihood of the ability to realize deferred tax assets in future periods on a quarterly basis, and when appropriate evidence indicates we would release our valuation allowance accordingly.

We utilize a two-step approach for evaluating uncertain tax positions. First, we evaluate recognition, which requires us to determine if the weight of available evidence indicates that a tax position is more likely than not to be sustained upon audit, including resolution of related appeals or litigation processes. If a tax position is not considered more likely than not to be sustained, no benefits of the position are recognized. Second, we measure the uncertain tax position based on the largest amount of benefit which is more likely than not to be realized on effective settlement. This process involves estimating our actual current tax exposure, including assessing the risks associated with tax audits, together with assessing temporary differences resulting from the different treatment of items for tax and financial reporting purposes. If actual results differ from our estimates, our net operating loss and credit carryforwards could be materially impacted.

Our realization of the benefits of the NOLs and credit carryforwards depends on sufficient taxable income in future years. We have established and recorded a full valuation allowance against the carrying value of our deferred tax assets, as it is currently more likely than not that we will not be able to realize these deferred tax assets. In addition, using NOLs and credits to offset future income subject to taxes may be subject to substantial annual limitations due to the “change in ownership” provisions of the U.S. Internal Revenue Code, or the Code, and similar state provisions. Events that cause limitations in the amount of NOLs that we may use in any one year include, but are not limited to, a cumulative ownership change of more than 50%, as defined by Code Sections 382 and 383, over a three-year period. Utilization of our NOLs and tax credit carryforwards could be significantly reduced if a cumulative ownership change of more than 50% has occurred in our past or occurs in our future.

We do not anticipate that the amount of our existing unrecognized tax benefits will significantly increase or decrease within the next 12 months. Due to the presence of NOLs in most jurisdictions, our tax years remain open for examination by taxing authorities back to 2000.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation under the Tax Cuts and Jobs Act, (“the Tax Act”). The Tax Act makes broad and complex changes to the U.S. tax code, including but not limited to: (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) requiring companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries; (3) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (4) eliminating the corporate alternative minimum tax (“AMT”) and how AMT credits are utilized; and (5) changing rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017. The effects of the Tax Act are discussed in Note 6 of the notes to our consolidated financial statements.

### ***Stock-Based Compensation***

We have equity incentive plans that are more fully described in “*Note 10 Stock-Based Awards*”.

We measure stock-based compensation cost on the grant date, based on the estimated fair value of the award using the Black-Scholes option-pricing model and recognized as an expense over the employee’s requisite service period on a straight-line basis. In valuing our option awards, we make assumptions about risk-free interest rates, dividend yields, volatility, and weighted-average expected lives. These estimates involve inherent uncertainties and the application of management’s judgment. If factors change and we must use different assumptions then, our stock-based compensation expense could be materially different in the future. We have not paid and do not anticipate paying cash dividends on common stock; therefore, the expected dividend yield is assumed to be zero. Beginning on January 1, 2017, we elected to account for forfeitures as they occur.

We also use the Black-Scholes option-pricing model to determine the fair value of each common share issued under the Employee Stock Purchase Plan, or the ESPP. The fair value for the ESPP grants is determined on the first day of each offering period.

We account for stock-based compensation arrangements with non-employees using a fair value approach. The compensation costs of these arrangements are subject to remeasurement over the vesting terms as earned.

Prior to the closing of our initial public offering, we granted stock options at exercise prices believed to be equal to the fair value of the common stock underlying such options as determined by the board of directors, with input from management, on the date of grant. Because such grants occurred prior to the public trading of our common stock, the board of directors exercised significant judgment in determining the fair market value of our common stock. The valuations were consistent with the guidance and methods outlined in the AICPA Practice Aid, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*, or AICPA Practice Aid, for all option grant dates. After the closing of the initial public offering, we granted stock options with exercise prices based on market prices.

For issuances of restricted stock units, we determine the fair value of the award based on the market value of our common stock at the date of grant.

#### ***Net Loss per Share Attributable to Common Stockholders***

Net loss per share attributable to common stockholders is computed by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding. We have outstanding stock options, unvested common stock subject to repurchase, warrants and convertible preferred stock, which are included in the calculation of diluted net loss attributable to common stockholders per share if their effect would be dilutive.

We calculate basic and diluted net loss per share attributable to common stockholders in conformity with the two-class method, in those periods where we had participating securities. We consider all series of convertible preferred stock to be participating securities. Under the two-class method, the net loss attributable to common stockholders is not allocated to the convertible preferred stock as the holders of convertible preferred stock do not have a contractual obligation to share in losses.

The diluted net loss per share attributable to common stockholders is computed by giving effect to all potential dilutive common stock equivalents outstanding for the period. For purposes of this calculation, convertible preferred stock, options to purchase common stock and warrants to purchase common stock and convertible preferred stock are considered potentially dilutive securities but have been excluded from the calculation of diluted net loss per share attributable to common stockholders as their effect is antidilutive.

#### ***Recently Adopted Accounting Standards***

In May 2014, the Financial Accounting Standards Board, or FASB, issued guidance on revenue recognition. This guidance provides that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. This guidance also requires more detailed disclosures to enable users of financial statements to understand the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. We adopted the new revenue standard on January 1, 2018 utilizing the full retrospective transition method. Revenue recognition related to our hardware products, standalone software, extended warranty, enhanced maintenance services and nonrecurring engineering development agreements, and recognition of cost of sales commissions is substantially unchanged. The primary impact of adopting the new standard relates to software license revenue that is recognized at the time of delivery, rather than ratably over the subscription period. Unrecognized software license revenue at December 31, 2017 and 2016 was not material. As adoption of the standard had no material impact on our consolidated financial position, results of operations or cash flows, we did not restate each prior reporting period presented in the period of initial application.

#### ***Recently Issued Accounting Standards Not Yet Adopted***

In February 2016, the FASB issued guidance on leases. This standard requires the recognition of a right-of-use asset and lease liability on the balance sheet for all leases. This standard also requires more detailed disclosures to enable users of financial statements to understand the amount, timing, and uncertainty of cash flows arising from leases. This guidance is effective for interim and annual reporting periods beginning after December 15, 2018.

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We plan to adopt the new lease standard on January 1, 2019 using the effective date modified retrospective transition method. As a result of this adoption, we expect to record right-of-use assets and lease liabilities on our consolidated balance sheet on January 1, 2019 and no prior reporting period presented will be restated. While we continue to assess all potential impacts of this new standard, we do not expect a material impact to results of operations or cash flows. Upon adoption of this new guidance, we will not need to implement new information technology systems.

In June 2016, the FASB issued guidance on the measurement of credit losses on financial instruments. This guidance requires the measurement and recognition of expected credit losses for financial assets held at amortized cost. This guidance is effective for interim and annual reporting periods beginning after December 15, 2019, and early adoption is permitted. We expect to adopt this guidance on January 1, 2020. The adoption of this guidance requires a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective. While we continue to assess all potential impacts of this new standard, we do not expect the adoption of this guidance to have a material impact on our financial position, results of operations or cash flows.

In June 2018, the FASB issued guidance on improvements to nonemployee share-based payment accounting that requires companies to account for share-based payments granted to nonemployees similarly to share-based payments granted to employees. This guidance is effective for fiscal years beginning after December 15, 2018, including the interim periods within those fiscal years. We plan to adopt this standard on January 1, 2019 and we do not expect the adoption of this guidance to impact our financial positions, results of operations or cash flows.

In August 2018, the FASB issued guidance to align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. This guidance is effective for fiscal years beginning after December 15, 2019, including the interim periods within those fiscal years. Early adoption of this guidance is permitted. We plan to early adopt this guidance prospectively effective January 1, 2019 and do not expect the adoption of this guidance to impact our financial positions, results of operations or cash flows.

### Note 3. Fair Value Measurements

The following table presents the balances of assets measured at fair value on a recurring basis, by level within the fair value hierarchy, as of the dates presented (in thousands):

	December 31, 2018			December 31, 2017		
	Level 1	Level 2	Total	Level 1	Level 2	Total
<b>Cash equivalents:</b>						
Money market funds	\$ 11,896	\$ —	\$ 11,896	\$ 10,393	\$ —	\$ 10,393
Commercial paper	—	—	—	—	1,000	1,000
Total cash equivalents	11,896	—	11,896	10,393	1,000	11,393
<b>Short-term investments:</b>						
U.S. government agency securities	—	7,482	7,482	—	13,970	13,970
Corporate notes and bonds	—	3,736	3,736	—	7,503	7,503
Commercial paper	—	9,943	9,943	—	8,972	8,972
Treasury bills	—	17,382	17,382	—	8,386	8,386
Total short-term investments	—	38,543	38,543	—	38,831	38,831
<b>Total</b>	<b>\$ 11,896</b>	<b>\$ 38,543</b>	<b>\$ 50,439</b>	<b>\$ 10,393</b>	<b>\$ 39,831</b>	<b>\$ 50,224</b>

We did not have any Level 3 assets as of December 31, 2018 or 2017 . There were no liabilities measured at fair value as of December 31, 2018 or 2017 .

**Note 4. Inventory**

The following table presents the detail of inventories as of the dates presented (in thousands):

	<u>December 31, 2018</u>	<u>December 31, 2017</u>
Raw materials	\$ 3,858	\$ 1,351
Work-in-process	13,671	15,647
Finished goods	27,196	30,085
Total Inventory	<u>\$ 44,725</u>	<u>\$ 47,083</u>

**Note 5. Property and Equipment**

The following table presents the detail of property and equipment as of the dates presented (in thousands):

	<u>December 31, 2018</u>	<u>December 31, 2017</u>
Laboratory equipment	\$ 14,505	\$ 11,223
Computer equipment and software	4,626	4,213
Furniture and fixtures	1,138	1,117
Equipment acquired under capital leases	3,972	4,468
Leasehold improvements	10,551	10,676
	34,792	31,697
Less: Accumulated depreciation	<u>(15,014)</u>	<u>(13,587)</u>
	<u>\$ 19,778</u>	<u>\$ 18,110</u>

Depreciation expense, which includes amortization of leased assets, was \$4.5 million, \$4.0 million and \$2.9 million for the years ended December 31, 2018, 2017 and 2016, respectively. The net book value of property and equipment acquired under capital leases was \$1.1 million and \$1.7 million at December 31, 2018 and 2017, respectively.

**Note 6 . Income Taxes**

We are subject to federal and state income taxes in the United States and foreign jurisdictions.

The following table presents the detail of income tax benefit (expense) for the periods presented (in thousands):

	Year Ended December 31,		
	2018	2017	2016
<b>Current:</b>			
U.S. - Federal	\$ —	\$ —	\$ —
U.S. - State	(23)	(8)	(15)
Foreign	(140)	(126)	(63)
	<u>(163)</u>	<u>(134)</u>	<u>(78)</u>
<b>Deferred:</b>			
U.S. - Federal	404	241	(91)
U.S. - State	(8)	(10)	1
Foreign	—	—	—
	<u>396</u>	<u>231</u>	<u>(90)</u>
<b>Total income tax benefit (expense)</b>	<u>\$ 233</u>	<u>\$ 97</u>	<u>\$ (168)</u>

We have not recorded a liability for U.S. income taxes and foreign withholding taxes on the undistributed earnings of foreign subsidiaries of December 31, 2018 as we intend to permanently reinvest future such earnings outside the United States. The amount of the unrecognized deferred tax liability, if incurred, would be expected to be immaterial.

The following table presents a reconciliation of the federal statutory rate and our effective tax rate for the periods presented:

	Year Ended December 31,		
	2018	2017	2016
U.S. Statutory Rate	21.0%	34.0%	34.0%
Change in valuation allowance	(20.6)	56.4	(11.8)
State taxes (net of federal benefit)	0.5	1.9	(4.4)
Federal research and development credit	4.1	7.1	67.4
Incentive stock options	(2.9)	12.5	(46.2)
Unrecognized tax benefits	(1.0)	(3.5)	(47.1)
Preferred stock warrant revaluation	—	—	12.6
Impact of Tax Cuts and Jobs Act of 2017	—	(113.5)	—
Return to provision - deductible transaction costs	—	5.6	—
Other, net	(0.4)	0.1	(15.5)
<b>Effective income tax rate</b>	<u>0.7%</u>	<u>0.6%</u>	<u>(11.0%)</u>

We continue to maintain a full valuation allowance against our net deferred tax assets in the U.S. but recognize deferred income tax expense in the U.S. solely based on the amortization of goodwill. Our net deferred tax liability attributable to the amortization of goodwill for tax purposes decreased during the year due to the creation of indefinite net operating loss carryforwards in the current year, which can be partially realized as a result of the deferred tax liability associated with the tax amortization of goodwill.



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Deferred federal, state and foreign income taxes reflect the net tax impact of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and such amounts for tax purposes. The following table presents the significant components of our deferred tax assets and liabilities as of the dates presented (in thousands):

	<u>December 31, 2018</u>	<u>December 31, 2017</u>
Net operating loss carryforwards	\$ 34,279	\$ 27,090
Credit carryforwards	8,071	7,478
Capitalized research and development	2,969	3,665
Deferred rent	1,021	1,189
Allowances	1,309	1,466
Deferred compensation	230	218
Deferred revenue	40	108
Stock-based compensation	1,340	525
Other	108	—
Deferred tax assets	49,367	41,739
Less: Valuation allowance	(48,481)	(41,130)
Net deferred tax assets	<u>886</u>	<u>609</u>
Deferred tax liability:		
Goodwill	(590)	(532)
Depreciation and amortization	(433)	(609)
Deferred tax liabilities	(1,023)	(1,141)
Net deferred tax liability	<u>\$ (137)</u>	<u>\$ (532)</u>

Realization of deferred tax assets is dependent upon the generation of future taxable income, if any, the timing and amount of which are uncertain. We have provided a full valuation allowance against the net deferred tax assets as of December 31, 2018 and 2017 because, based on the weight of available evidence, it is more likely than not (a likelihood of more than 50%) that some or all of the deferred tax assets will not be realized.

We have accumulated federal tax losses of approximately \$159.5 million and \$126.4 million, respectively, as of December 31, 2018 and 2017, which are available to reduce future taxable income. We have accumulated state tax losses of approximately \$23.8 million and \$18.4 million, respectively, as of December 31, 2018 and 2017. Additionally, we have net research and development credit carryforwards of \$10.6 million and \$9.7 million, respectively, as of December 31, 2018 and 2017, which are available to reduce future tax liabilities. The tax loss and research and development credit carryforwards begin to expire in 2020. Under Sections 382 and 383 of the Internal Revenue Code, 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 or income tax liability may be limited.

We are currently not under audit in any tax jurisdiction. Tax years from 2000 through 2018 are currently open for audit by federal and state taxing authorities.

We establish reserves for tax positions based on estimates of whether, and the extent to which, additional taxes will be due. The reserves are established when we believe that positions might be challenged by taxing authorities despite our belief that our tax return positions are fully supportable.

The following table presents the total balance of unrecognized tax benefits as of the dates presented (in thousands):

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
Balance at beginning of period	\$ 2,906	\$ 2,597	\$ 1,878
Gross increase to tax positions in prior periods	—	2	210
Gross increase to tax positions in current periods	253	307	509
Balance at end of period	<u>\$ 3,159</u>	<u>\$ 2,906</u>	<u>\$ 2,597</u>

At December 31, 2018, the total amount of unrecognized tax benefits of \$3.2 million is recorded as a reduction to the deferred tax asset. We do not anticipate that the amount of existing unrecognized tax benefits will significantly increase or decrease within the next 12 months. Accrued interest and penalties related to unrecognized tax benefits are recorded as income tax expense and are zero.

### ***Tax Cuts and Jobs Act***

The Tax Cuts and Jobs Act, or the Act, was enacted in the US on December 22, 2017. The Act reduced the U.S. federal corporate income tax rate to 21% from 34%, required companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and created new taxes on certain foreign-sourced earnings. In 2017 and the first nine months of 2018, we recorded provisional amounts for certain enactment-date effects of the Act by applying the guidance in SAB 118 because we had not yet completed our enactment-date accounting for these effects. At December 31, 2018, we have completed our accounting for all of the enactment date income tax effects of the Act. In 2018 and 2017, we recorded tax expense related to the enactment-date effects of the Act that included adjusting deferred tax assets and liabilities. The changes to 2017 enactment-date provisional amounts resulted in a tax benefit of \$413,000.

While the Tax Act provides for a modified territorial tax system, beginning in 2018, global intangible low-taxed income, or GILTI, provisions will be applied providing an incremental tax on low taxed foreign income. The GILTI provisions require us to include in our U.S. income tax return foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary's tangible assets. During 2018, we made an accounting policy election to treat taxes related to GILTI as a current period expense when incurred.

## **Note 7. Debt Facilities**

### ***Senior Credit Facility***

On March 5, 2018, we amended our senior credit facility, to, among other things, extend the maturity date of the \$25.0 million revolving credit facility, with a \$5.0 million letter of credit sub-facility, to March 5, 2020, and provide for a new \$20.0 million term loan. We drew down \$9.0 million in term-loan borrowings to refinance \$7.9 million of term-loan borrowings and \$1.1 million of equipment loans and have \$11.0 million of term-loan borrowings available for general corporate purposes. The term loan will amortize over 36 months, beginning on April 1, 2019, following an initial interest-only period, and mature on March 1, 2022. We may prepay the term loan at any time, subject to a prepayment fee equal to 2.0% of the outstanding principal amount if prepaid on or before March 5, 2019, or 1.0% of the outstanding principal amount if prepaid after March 5, 2019, but on or before March 5, 2020.

On August 17, 2018, we amended our senior credit facility, to provide for a \$4.0 million equipment advance which we will use solely to purchase equipment. The equipment advance will amortize over 48 months, beginning September 1, 2018 and mature on August 1, 2022. We may prepay the equipment advance at any time, subject to a prepayment fee equal to 2% of the principal amount of the equipment advance if prepaid on or before August 17, 2019, or 1% of the principal amount of the equipment advance if prepaid after August 17, 2019, but on or before August 17, 2020.

The loans accrue interest, at our option, at (1) a LIBOR rate determined in accordance with the senior credit facility, plus a margin ranging from 2.75% to 4.00%, or (2) a prime rate determined in accordance with the senior credit facility, plus a margin ranging from 0.0% to 1.25%. The margin percentage is determined based upon whether the outstanding borrowing is a term loan, revolving loan, or an equipment advance and our adjusted EBITDA for the preceding 12 month period. Interest is due and payable in arrears monthly for prime rate loans and at the end of an interest period for LIBOR rate loans.

The senior credit facility includes financial and operating covenants, including a minimum liquidity ratio and maximum adjusted EBITDA loss threshold that both apply in the event we do not maintain a minimum liquidity threshold, which are set forth in detail in the credit facility agreement. We were in compliance with the covenants under our senior credit facility as of December 31, 2018. Our obligations under the senior credit facility are collateralized by substantially all of our assets other than intellectual property.

At December 31, 2018, \$20.0 million and \$3.7 million of term loan and equipment loans were outstanding, respectively, excluding unamortized debt issuance costs of \$0.1 million. The weighted average interest rate was 6.3% at December 31, 2018. The following table presents the scheduled principal maturities as of December 31, 2018 (in thousands):

2019	\$	6,000
2020		7,667
2021		7,667
2022		2,333
Total	\$	<u>23,667</u>

### ***Mezzanine Credit Facility***

We had a mezzanine loan and security agreement, which we referred to as our mezzanine credit facility, with SG Enterprises II, LLC, which provided for a \$5.0 million term loan which was drawn in September 2015. On July 26, 2016, we repaid without premium or penalty the principal and accrued interest on the \$5.0 million term loan pursuant to the mezzanine credit facility and wrote-off unamortized debt discounts and issuance costs of \$109,000.

## **Note 8. Redeemable Convertible Preferred Stock and Stockholders' Equity**

### ***Redeemable Convertible Preferred Stock***

Upon the effectiveness of the registration statement related to the initial public offering on July 20, 2016, all of our previously outstanding shares of redeemable convertible preferred stock automatically converted into 8,531,146 of common stock at the conversion rate of 1-to-1 and shares of Series 2 redeemable convertible preferred stock automatically converted into common stock at the conversion ratio of 1-to-1.25. The related carrying value of the redeemable convertible preferred stock of \$106.1 million was reclassified to common stock and additional paid-in capital.

Our previously outstanding Series 1 and Series 2 preferred stock included certain redemption provisions which prevented us from including these amounts in stockholders' equity (deficit). Holders of our Series 1 and Series 2 redeemable convertible preferred stock were entitled to accretion equal to 7% annual interest (non-compounded) on the original price paid per share of the applicable series of preferred stock. We recorded no accretion in 2018 and 2017 and accretion of \$6.3 million in 2016 in respect of our outstanding Series 1 and Series 2 redeemable convertible preferred stock. Accretion is generally recorded against distributable earnings. Since we had accumulated losses, we recorded accretion against additional paid-in capital until there was no remaining capital.

### ***Preferred Stock***

Our board of directors has the authority to fix the designations, powers, preferences and rights, and the qualifications, limitations or restrictions thereof, of any wholly unissued series of preferred stock, and to increase or decrease the number of shares in any series of preferred stock, subject to limitations prescribed by law or by our certificate of incorporation. There was no preferred stock issued and outstanding as of December 31, 2018 or 2017.

### ***Common Stock***

As of December 31, 2018, we had authorized 495,000,000 shares of voting \$0.001 par value common stock. Each holder of the common stock is entitled to one vote per common share. At its discretion, the board of directors may declare dividends on shares of common stock, subject to the prior rights of our preferred stockholders. Upon liquidation or dissolution, holders of common stock will receive distributions only after preferred stock preferences have been satisfied.

The following shares of common stock have been reserved for future issuance as of the dates presented (in thousands):

	December 31, 2018	December 31, 2017
Option awards outstanding	3,603	2,850
Restricted stock units outstanding	32	12
Common stock reserved under equity incentive plans	1,109	1,221
Common stock reserved under employee stock purchase plan	448	374
Total	<u>5,192</u>	<u>4,457</u>

## Note 9. Stock-Based Awards

### *2016 Equity Incentive Plan*

In June 2016, our board of directors adopted and our stockholders approved the 2016 Equity Incentive Plan, or the 2016 Plan, which became effective in July 2016 at which time the 2010 Equity Incentive Plan, or the 2010 Plan, was terminated. Our 2000 Stock Plan was terminated in March 2010. The number of shares of common stock reserved for issuance under the 2016 Plan may increase on January 1 of each year, beginning on January 1, 2017 and ending on and including January 1, 2026, by the least of (1) 1,825,000 shares; (2) 5% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year; and (3) a lesser number of shares determined by our board of directors. The 2016 Plan provides for the grant of incentive or non-qualified stock options, restricted stock, restricted stock units, stock appreciation rights and performance shares or performance units to employees, non-employee directors, and consultants.

All options granted under the 2000 Stock Plan, the 2010 Plan and the 2016 Plan have a maximum 10-year term and generally vest and become exercisable over four years of continued employment or service as defined in each option agreement. We generally grant stock options with exercise prices that equal the fair value of the common stock on the date of grant. As allowed under the 2016 Plan, there are a few exceptions to this vesting schedule, which provide for vesting at different rates or based on achievement of performance targets.

### *Option Awards*

On April 18, 2018, we commenced a voluntary stock option exchange program, designed to provide eligible employees an opportunity to exchange certain outstanding underwater stock options for a lesser amount of new options to be granted with lower exercise prices. Stock options eligible for exchange were those with an exercise price per share equal to or greater than \$21.72, whether vested or unvested. All employees (including executive officers but excluding the chief executive officer) who held options and remain employed through the date of grant for new options were eligible to participate in the offer. Members of the board of directors were not eligible to participate. The option exchange program expired on May 16, 2018. Options for an aggregate of approximately 1.0 million shares were tendered by employees, representing 73% of the total shares underlying stock options eligible for exchange.

On May 16, 2018, we granted options for an aggregate of 0.7 million shares in exchange for the eligible options surrendered. The new options were granted under, and subject to, the terms and conditions of the 2016 Plan. The exercise price of the new stock options is \$17.33, which was the closing price of our common stock on May 16, 2018. No incremental stock option expense was recognized for the exchange, because the fair value of the surrendered options, as determined based on the Black-Scholes option-pricing model, was equal to or greater than the fair value of the new stock options issued in the exchange.

The following table summarizes option award activity for the year ended December 31, 2018 (in thousands, except per share data and years):

	Number of Shares Underlying Options	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Life (Years)	Total Intrinsic Value
<b>Outstanding at December 31, 2017</b>	2,850	\$ 21.16	8.01	\$ 20,802
Granted or exchanged	2,621	19.97		
Exercised	(326)	4.02		
Expired	—	—		
Forfeited, cancelled or exchanged	(1,542)	30.91		
<b>Outstanding at December 31, 2018</b>	<u>3,603</u>	17.67	8.43	7,898
Vested and exercisable at December 31, 2018	953	\$ 10.29	6.11	\$ 6,904

We estimate the fair value of options granted at the date of grant using the Black-Scholes option-pricing model with the following assumptions for the periods presented:

	Year Ended December 31,		
	2018	2017	2016
Risk-free interest rate	2.3% – 3.1%	1.8% – 2.2%	1.1% – 2.1%
Expected dividends yield	None	None	None
Expected volatility	57.7% - 66.1%	52.2% – 59.1%	40.8% – 49.5%
Weighted-average expected life	6.04	6.08	5.78
Weighted-average fair value of options granted	\$ 11.85	\$ 19.15	\$ 9.60

We determined that it was not practicable to calculate the volatility of our share price since we do not have an extensive public trading history for shares of our common stock. Therefore, we estimated our volatility based on a combination of our historical volatility since becoming a publicly traded company and reported market value data for a group of publicly-traded entities that we believe are relatively comparable after consideration of their size, stage of lifecycle, profitability, growth and risk and return on investment.

To determine the expected life, we generally apply the simplified approach in which the expected life of an award is presumed to be the mid-point between the vesting date and the expiration date of the options as we do not have sufficient historical exercise data to provide a reasonable basis for an estimate of expected term.

The total intrinsic value of options exercised during 2018, 2017 and 2016 was \$4.3 million, \$14.9 million and \$1.1 million, respectively. The total fair value of options vested was \$6.0 million, \$3.1 million and \$1.4 million during 2018, 2017 and 2016, respectively.

As of December 31, 2018, our total unrecognized stock-based compensation cost related to unvested stock options was \$31.3 million, which will be recognized over the weighted-average remaining requisite service period of 3.0 years.

#### ***Unvested Shares***

Prior to the adoption of our 2016 Plan, we provided employees with the opportunity to early exercise stock options subject to the original vesting schedule of the option. In the event of voluntary or involuntary termination of employment with us, we have an irrevocable and exclusive option to repurchase the unvested portion of the shares at the original exercise price after the termination of employment. We account for cash received in consideration for the purchase of unvested shares of common stock or the early exercise of unvested stock options as a current liability and include it in accrued compensation and employee related benefits on the consolidated balance sheet. The number of unvested shares subject to repurchase outstanding as of December 31, 2018 and 2017 were not material.

**Restricted Stock Units**

The following table summarizes activity for restricted stock units for the year ended December 31, 2018 (in thousands, except per share data):

	Shares Outstanding	
	Number of Shares	Weighted-Average Grant Date Fair Value
<b>Outstanding at December 31, 2017</b>	12	\$ 46.53
Granted	80	18.74
Vested	(60)	23.45
Forfeited	—	-
<b>Outstanding at December 31, 2018</b>	<b>32</b>	<b>20.21</b>

The fair value of the outstanding restricted stock units will be recorded as stock-based compensation expense over the vesting period. As of December 31, 2018, there was \$0.4 million of total unrecognized compensation cost related to unvested restricted stock units, which is expected to be recognized over a weighted average period of 0.8 years.

**Employee Stock Purchase Plan**

In 2016, we adopted the 2016 Employee Stock Purchase Plan, or the ESPP, which became effective in July 2016. Under the ESPP, eligible employees can authorize payroll deductions for amounts up to 15% of their eligible compensation. A participant may purchase a maximum of 4,000 shares each six-month period or some lesser number of shares as determined by the IRS rules. The offering periods generally start on the first trading day on or after February 20 and August 20 of each year. Participants in an offering period will be granted the right to purchase common shares at a price per share that is 85% of the least of the fair market value of the shares at (1) the first day of the offering period and (2) the end of each purchase period within the offering period. The fair value of the ESPP options granted is determined using a Black-Scholes option-pricing model and is amortized on a straight-line basis over the related offering period. The number of shares reserved for the ESPP may increase each year, beginning on January 1, 2017 and continuing through and including January 1, 2036, by the least of: (1) 1% of the total number of shares of common stock outstanding on the first day of such year; (2) 365,411 shares of common stock; and (3) such amount as determined by our board of directors.

As of December 31, 2018, the total unrecognized stock-based compensation related to the ESPP was \$0.3 million and will be recognized on a straight-line basis over the weighted-average remaining service period of 0.1 years.

We estimate the fair value of the ESPP options granted at the start of the offering period using the Black-Scholes option-pricing model with the following assumptions for the periods presented:

	Year Ended December 31,		
	2018	2017	2016
Risk-free interest rate	2.4%	0.7% – 1.1%	0.4%
Expected term	0.3 years	0.5 years	0.5 years
Expected volatility	75.9%	66.5% – 71.2%	61.8%

**Stock-Based Compensation Expense**

The following table presents the detail of stock-based compensation expense amounts included in our consolidated statements of operations for the periods indicated (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Cost of revenue	\$ 469	\$ 231	\$ 96
Research and development expense	3,663	2,431	983
Sales and marketing expense	4,166	3,113	1,289
General and administrative expense	3,019	1,653	397
Total stock-based compensation expense	<u>\$ 11,317</u>	<u>\$ 7,428</u>	<u>\$ 2,765</u>

**Note 10. Commitments and Contingencies****Leases**

We have various non-cancellable operating lease agreements for office, warehouse and research and development space in the U.S., China, and Thailand, with expiration dates from 2019 to 2026. Certain of these arrangements have free or escalating rent payment provisions and optional renewal clauses. We also hold a lease for approximately 39,000 square feet of commercial office space in Seattle, Washington expiring in 2023, and we have sublet the entire portion of this office through such expiration date.

We recognize rent expense on a straight-line basis over the lease period. Total rent expense under operating leases was \$3.1 million, \$3.4 million and \$2.9 million for the years ended December 31, 2018, 2017 and 2016 respectively.

We lease a portion of our property and equipment under capital leases, which include options allowing us to purchase the equipment at the end of the lease term.

The following table presents future minimum lease payments under operating and capital leases as of December 31, 2018 (in thousands):

	Operating	Capital
2019	\$ 3,573	\$ 575
2020	3,340	270
2021	3,305	—
2022	3,193	—
2023	3,140	—
Thereafter	9,947	—
Total minimum lease payments	<u>\$ 26,498</u>	<u>\$ 845</u>
Less: Portion representing interest		(64)
Present value of capital lease obligations		781
Less: Current portion of capital lease obligations		(523)
Capital lease obligations net of current portion		<u>\$ 258</u>

### ***Indemnifications***

In the normal course of business, we may enter into agreements that require us to indemnify either customers or suppliers for specific risks. While we cannot estimate our maximum exposure under these indemnification provisions, to date they have not had a material impact on our consolidated results of operations or financial condition.

### ***Litigation***

From time to time, we are subject to various legal proceedings or claims that arise in the ordinary course of business. We accrue a liability when management believes that it is both probable that a liability has been incurred and the amount of loss can be reasonably estimated, and as of December 31, 2018 and 2017, we have not recorded any such liabilities. The following is a brief description of the more significant legal proceedings. Although we believe that resolving such claims, individually or in aggregate, will not have a material adverse impact on our financial statements, these matters are subject to inherent uncertainties.

#### Audit Committee Investigation

Following our announcement on August 2, 2018 that the audit committee of our board of directors commenced an independent investigation in connection with a complaint filed by a former employee, several securities class-action and derivative lawsuits were filed against us. On September 12, 2018, we announced that the audit committee, assisted by independent counsel that the committee retained to oversee a thorough and careful investigation, concluded that there was no credible evidence supporting the former employee's complaint. Accordingly, the audit committee determined that no additional actions were necessary or warranted with respect to the complaint or the investigation, including that no adjustments to past financial statements were appropriate or required, and that at that time, no further investigatory steps needed to be taken.

#### Federal Securities Class Actions

On August 7, 2018, a class action complaint for violation of the federal securities laws was filed in the U.S. District Court for the Central District of California against us, our chief executive officer and chief operations officer. Captioned *Schultz v. Impinj, Inc., et al* , the complaint, purportedly brought on behalf of all purchasers of our common stock from May 7, 2018 through and including August 2, 2018, asserted claims that our quarterly statement filed on Form 10-Q for the first quarter of 2018 and a concurrent press release made false or misleading statements about our business prospects and financial condition. The complaint sought monetary damages, costs and expenses. On October 3, 2018, the plaintiff voluntarily dismissed this complaint on October 3, 2018.

On August 27, 2018, a second class action complaint for violation of the federal securities laws was filed in the U.S. District Court for the Western District of Washington against us, our chief executive officer, chief operations officer and former chief financial officer. Captioned *Montemarano v. Impinj, Inc., et al* ., the complaint, purportedly brought on behalf of all purchasers of our common stock from May 4, 2017 through and including August 2, 2018, asserts claims that we made false or misleading statements in our financial statements, press releases and conference calls during the purported class period in violation of Section 10(b) of the Securities Exchange Act. The complaint seeks monetary damages, costs and expenses.

On October 2, 2018, a third class action complaint for violation of the federal securities laws was filed in the U.S. District Court for the Western District of Washington against us, our chief executive officer, chief operations officer and former chief financial officer. Captioned *Employees' Retirement System of the City of Baton Rouge and Parish of East Baton Rouge v. Impinj, Inc., et al* ., the complaint, purportedly brought on behalf of all purchasers of our common stock from November 3, 2016 through and including February 15, 2018, asserts claims that we made false or misleading statements about customer demand for our products and inventory in SEC filings, press releases and conference calls in violation of Section 10(b) of the Securities Exchange Act . The complaint seeks monetary damages, costs and expenses.

On January 14, 2019, the U.S. District Court for the Western District of Washington consolidated the *Montemarano* and *Baton Rouge* actions and appointed the Employees' Retirement System of the City of Baton Rouge and Parish of East Baton Rouge as lead plaintiff. On February 13, 2019, lead plaintiff filed a consolidated amended complaint. The consolidated amended complaint alleges that from July 21, 2016 through February 15, 2018, we made false or misleading statements about customer demand and the capability of our products and platform in violation of Section 10(b) of the Securities Exchange Act. Defendants' motion to dismiss the consolidated amended complaint is due March 19, 2019.



New York State Securities Class Action

On January 31, 2019, a fourth class action complaint for violation of the federal securities laws was filed in the Supreme Court of the State of New York for the County of New York against us, our chief executive officer, chief operations officer, former chief financial officer, members of our board of directors and the underwriters of our July 2016 initial public stock offering, or IPO, and December 2016 secondary public offering, or SPO. Captioned *Plymouth County Retirement System v. Impinj, Inc., et al.*, the complaint, purportedly brought on behalf of purchasers of our stock pursuant to or traceable to our IPO and SPO, alleges that we made false or misleading statements in the registration statements and prospectuses in those offerings concerning demand for our products and inventory in violation of Section 11 of the Securities Act of 1933.

Shareholder Derivative Actions

On October 26, 2018, two shareholder derivative actions were filed in the U.S. District Court for the District of Delaware against our chief executive officer, chief operations officer, former chief financial officer and certain of our directors. We are a nominal defendant. On November 8, 2018, a third shareholder derivative action was filed in this same court against the same defendants. Captioned *Weiss v. Diorio, et al.*, *Fotouhi v. Diorio, et al.*, and *De la Fuente v. Diorio, et al.*, the derivative complaints, purportedly brought on behalf of us, allege that the defendants breached their fiduciary duties to us and allegedly made false or misleading statements and omissions of material fact in violation of Section 14(a) of the Securities Exchange Act regarding our business and operations. The derivative actions include claims for, among other things, unspecified damages in favor of us, corporate actions to purportedly improve our corporate governance, and an award of costs and expenses to the derivative plaintiffs, including attorneys' fees.

On January 28, 2019, the Delaware federal court entered a stipulated order that stayed these actions until resolution of the federal securities class actions.

***Obligations with Third-Party Manufacturers***

We manufacture products with third-party manufacturers. We are committed to purchase \$9.6 million of inventory as of December 31, 2018.

**Note 11. Restructuring**

On February 13, 2018, we began implementing a restructuring to align our strategic and financial objectives and optimize our resources for long-term growth, including a reduction-in-force affecting approximately 9% of our employees, subleasing unused office space and closing some remote offices. As a result of the restructuring, we recorded a restructuring charge of \$3.7 million for the year ended December 31, 2018.

The following table summarizes the activity associated with the restructuring (in thousands):

	<b>Employee Termination Benefits</b>	<b>Cease-Use Costs</b>	<b>Other Associated Costs</b>	<b>Total</b>
Balance at December 31, 2017	\$ —	\$ —	\$ —	\$ —
Restructuring costs	1,133	2,538	78	3,749
Cash payments	(1,039)	(2,017)	(78)	(3,134)
Non-cash benefit, net	—	454	—	454
Balance at December 31, 2018	<u>\$ 94</u>	<u>\$ 975</u>	<u>\$ —</u>	<u>\$ 1,069</u>

Employee termination benefits primarily include severance and other personnel related expenses. Cease-use costs primarily relate to non-cancellable lease rental obligations, net of sublease rental income and a non-cash net restructuring benefit of \$454,000 associated with a write-off of certain leasehold improvement and deferred rent. Other associated costs represent various professional fees incurred as a result of the restructuring. The restructuring plan was substantially completed as of June 30, 2018. The portion of the restructuring liability related to cease-use costs will decrease over the remaining lease period which goes through January 2023.

**Note 12. Deferred Revenue**

Deferred revenue, consisting of individually immaterial amounts for extended warranty, enhanced maintenance and advanced payments on nonrecurring engineering services contracts, represents contracted revenue that has not yet been recognized.

The following table presents the changes in deferred revenue for the periods presented (in thousands):

	Year Ended December 31,	
	2018	2017
Balance at beginning of period	\$ 1,215	\$ 1,411
Deferral of revenue	587	1,476
Recognition of deferred revenue	(968)	(1,672)
Balance at end of period	\$ 834	\$ 1,215

**Note 13. Segment Reporting**

We have one reportable segment: the development and sale of our products and services. Our reportable segment has been identified based on how our chief operating decision-maker manages our business, makes operating decisions and evaluates operating performance. Our chief executive officer acts as the chief operating decision-maker and reviews financial and operational information on an entity-wide basis. We have one business activity and there are no segment managers who are held accountable for operations, operating results or plans for levels or components. Accordingly, we have determined that we have a single reporting segment and operating unit structure.

Our chief executive officer reviews information about revenue categories, including endpoint ICs and systems. We define systems as reader ICs, modules, readers, gateways and software. The following table presents our revenue categories for the periods presented (in thousands):

	Year Ended December 31,		
	2018	2017	2016
<b>Revenue:</b>			
Endpoint ICs	\$ 84,974	\$ 91,699	\$ 86,218
Systems	37,659	33,601	26,069
Total revenue	\$ 122,633	\$ 125,300	\$ 112,287

Our assets are primarily located in the United States and not allocated to any specific geographic region. Therefore, geographic information is presented only for total revenue. Substantially all our long-lived assets are located in the United States.

The following table is based on the location of the value-added resellers, inlay manufacturers, reader OEMs, distributors or end users who purchased products and services directly from us. For sales to our resellers and distributors, their location may be different from the locations of the ultimate end users. The following table presents our sales by geography for the periods presented (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Americas	\$ 30,636	\$ 29,656	\$ 26,401
Asia Pacific	79,290	80,531	73,084
Europe, Middle East and Africa	12,707	15,113	12,802
Total revenue	\$ 122,633	\$ 125,300	\$ 112,287

Total revenue in the United States, included in Americas, was \$29.5 million, \$28.8 million and \$25.9 million for the years ended December 31, 2018, 2017 and 2016, respectively. Total revenue in China (including Hong Kong), included in Asia Pacific, was \$64.3 million, \$68.0 million and \$59.3 million for the years ended

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December 31, 2018, 2017 and 2016, respectively. No sales to countries other than the United States and China accounted for more than 10% of revenue for the years ended December 31, 2018, 2017 and 2016.

**Note 14. Net Loss per Share**

For the periods presented, the following table provides a reconciliation of the numerator and denominator used in computing basic and diluted net loss per share attributable to common stockholders (in thousands, except per share amounts):

	Year Ended December 31,		
	2018	2017	2016
<b>Numerator:</b>			
Net loss	\$ (35,231)	\$ (17,322)	\$ (1,673)
Less: Accretion of preferred stock	—	—	(6,258)
Net loss attributable to common stockholders	<u>\$ (35,231)</u>	<u>\$ (17,322)</u>	<u>\$ (7,931)</u>
<b>Denominator:</b>			
Weighted-average shares used to compute net loss per share attributable to common stockholders — basic and diluted	21,334	20,680	10,778
Net loss per share attributable to common stockholders — basic and diluted	<u>\$ (1.65)</u>	<u>\$ (0.84)</u>	<u>\$ (0.74)</u>

The following outstanding options, warrants and shares of preferred stock were excluded from the computation of diluted net loss per share attributable to common stockholders for the periods presented because their effect would have been antidilutive (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Unvested shares of common stock subject to repurchase	20	48	118
Stock options	3,284	2,911	2,310

**Note 15. Retirement Plans**

In 2001, we adopted a salary deferral 401(k) plan for our employees. The plan allows employees to contribute a percentage of their pretax earnings annually, subject to limitations imposed by the Internal Revenue Service. The plan also allows us to make a matching contribution, subject to certain limitations. To date, we have not made any contributions to the plan.

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

None.

**Item 9A. Controls and Procedures*****Evaluation of Disclosure Controls and Procedures***

Our management, with the participation of our chief executive officer and our principal financial officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2018. Disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is (1) recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (2) accumulated and communicated to management, including its principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosure. Based on the evaluation of our disclosure controls and procedures, our chief executive officer and principal financial officer concluded that our disclosure controls and procedures were effective at a reasonable assurance level as of December 31, 2018.

***Management's Report on Internal Control Over Financial Reporting***

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined under Rule 13a-15(f) and 15d-15(f) under the Exchange Act. We conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on our evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2018.

This annual report does not include an attestation report of our independent registered public accounting firm regarding internal control over financial reporting. Management's report was not subject to attestation by our registered public accounting firm pursuant to rules of the Securities and Exchange Commission that permit us to provide only management's report in this annual report.

***Remediation of Previously Identified Material Weakness in Internal Control Over Financial Reporting***

We previously identified and disclosed in our Annual Reports on Form 10-K a material weakness in our internal control over financial reporting relating to the accounting and financial statement disclosure over complex accounting matters.

Prior to the three-month period ended December 31, 2018, management implemented processes and controls to enhance our internal control over financial reporting related to the accounting and financial statement disclosure of complex accounting matters. Actions taken to remediate the control included:

- increasing the depth and experience within our accounting organization;
- formalization of the process to identify, document, and review complex accounting matters; and
- enhancing the communication and coordination among our accounting and financial reporting department with expanded cross-functional involvement and input into period-end disclosures

We believe these additional control procedures have strengthened our internal control over financial reporting and addressed the material weakness.

During the fourth quarter of 2018, we completed testing over the operating effectiveness of the controls and have concluded that the material weakness has been remediated as of December 31, 2018.

***Changes in Internal Control over Financial Reporting***

There were no changes that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting during the three months ended December 31, 2018.

***Limitations on Controls***

Our disclosure controls and procedures and internal control over financial reporting are designed to provide reasonable assurance of achieving the desired control objectives. Our management recognizes that any control system, no matter how well designed and operated, is based upon certain judgments and assumptions and cannot provide absolute assurance that its objectives will be met. Similarly, an evaluation of controls cannot provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been detected.

**Item 9B. Other Information**

None.

## PART III

### **Item 10. Directors, Executive Officers and Corporate Governance**

The information required by this item is incorporated by reference to our definitive proxy statement relating to the 2019 annual meeting of stockholders. The definitive proxy statement will be filed with the SEC within 120 days after the end of the 2018 fiscal year.

We have adopted a Code of Ethics that applies to our Chief Executive Officer, Chief Financial Officer, principal accounting officer and controller and persons performing similar functions. The Code of Ethics is posted on our website at <http://corporate-governance.impinj.com>. We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K regarding an amendment to, or waiver from, a provision of the Code of Ethics by posting such information on our website at the address specified above.

### **Item 11. Executive Compensation**

The information required by this item is incorporated by reference to our definitive proxy statement relating to the 2019 annual meeting of stockholders. The definitive proxy statement will be filed with the SEC within 120 days after the end of the 2018 fiscal year.

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

The information required by this item is incorporated by reference to our definitive proxy statement relating to the 2019 annual meeting of stockholders. The definitive proxy statement will be filed with the SEC within 120 days after the end of the 2018 fiscal year.

### **Item 13. Certain Relationships and Related Transactions, and Director Independence**

The information required by this item is incorporated by reference to our definitive proxy statement relating to the 2019 annual meeting of stockholders. The definitive proxy statement will be filed with the SEC within 120 days after the end of the 2018 fiscal year.

### **Item 14 . Principal Accounting Fees and Services**

The information required by this item is incorporated by reference to our definitive proxy statement relating to the 2019 annual meeting of stockholders. The definitive proxy statement will be filed with the SEC within 120 days after the end of the 2018 fiscal year.

## PART IV

### Item 15. Exhibits and Financial Statement Schedules

(a)(1) *Financial Statements*

We have filed the financial statements listed in the Index to Consolidated Financial Statements as a part of this report.

(a)(2) *Financial Statement Schedules*

All financial statement schedules have been omitted because they are not applicable, not material or the required information is presented in the financial statements or the notes thereto.

(a)(3) *Exhibits*

The list of exhibits included in the Exhibit Index to this report is incorporated herein by reference.

NUMBER	DESCRIPTION	INCORPORATION BY REFERENCE		
		Form	Date	Number
3.1	<a href="#">Amended and Restated Certificate of Incorporation</a>	10-Q	9/2/2016	3.1
3.2	<a href="#">Amended and Restated Bylaws</a>	S-1/A	7/11/2016	3.2
4.1	<a href="#">Specimen Common Stock Certificate of the registrant</a>	S-1/A	7/11/2016	4.1
4.2	<a href="#">Amended and Restated Investors' Rights Agreement, dated July 13, 2012, by and among the registrant and the investors and founders named therein</a>	S-1	6/2/2016	4.2
10.1+	<a href="#">Form of Director and Executive Officer Indemnification Agreement</a>	S-1/A	7/11/2016	10.1
10.2+	<a href="#">2000 Stock Plan, as amended</a>	S-1	6/2/2016	10.2
10.3+	<a href="#">Form of Notice of Stock Option Grant and Stock Option Agreement permitting early exercise under the 2000 Stock Plan</a>	S-1	6/2/2016	10.3
10.4+	<a href="#">2010 Equity Incentive Plan, as amended</a>	S-1	6/2/2016	10.4
10.5+	<a href="#">Form of Notice of Stock Option Grant and Stock Option Agreement under the 2010 Equity Incentive Plan</a>	S-1	6/2/2016	10.5
10.6+	<a href="#">Form of Notice of Stock Option Grant and Stock Option Agreement permitting early exercise under the 2010 Equity Incentive Plan</a>	S-1	6/2/2016	10.6
10.7+	<a href="#">2016 Equity Incentive Plan</a>	S-1/A	7/11/2016	10.7
10.8+	<a href="#">Form of Notice of Stock Option Grant and Stock Option Agreement under the 2016 Equity Incentive Plan</a>	S-1/A	7/11/2016	10.8
10.9+	<a href="#">2016 Employee Stock Purchase Plan</a>	S-1/A	7/11/2016	10.9
10.10+	<a href="#">Amended and Restated Diorio Employment Agreement, dated December 19, 2008, between the registrant and Chris Diorio, Ph.D.</a>	S-1	6/2/2016	10.12
10.11+	<a href="#">First Amendment to Diorio Employment Agreement, dated February 20, 2009, between the registrant and Chris Diorio, Ph.D.</a>	S-1	6/2/2016	10.13
10.12+	<a href="#">Executive Employment Agreement, dated April 1, 2014, between the registrant and Eric Brodersen</a>	S-1	6/2/2016	10.14
10.13+	<a href="#">First Amendment to Brodersen Employment Agreement, dated February 9, 2015, between the registrant and Eric Brodersen</a>	S-1	6/2/2016	10.15
10.14+	<a href="#">Fein Employment Agreement, dated December 23, 2009, between the registrant and Evan Fein</a>	S-1	6/2/2016	10.16
10.15+	<a href="#">First Amendment to Fein Employment Agreement, dated February 9, 2015, between the registrant and Evan Fein</a>	S-1	6/2/2016	10.17



10.16†	<a href="#"><u>Second Amended and Restated Loan and Security Agreement, dated March 26, 2014, between the registrant and Silicon Valley Bank, as amended by the First Amendment dated September 29, 2014, Second Amendment dated February 4, 2015, the Third Amendment dated April 17, 2015, the Fourth Amendment dated September 25, 2015, the Fifth Amendment dated March 24, 2016 and the Sixth Amendment dated May 27, 2016.</u></a>	S-1	6/2/2016	10.19
10.16	<a href="#"><u>Third Amended and Restated Loan and Security Agreement, dated as of April 24, 2017, by and between Impinj, Inc. and Silicon Valley Bank</u></a>	8-K	4/26/2017	99.1
10.18	<a href="#"><u>Office Lease, dated December 10, 2014, by and between the registrant and 400 Fairview LLC</u></a>	S-1	6/2/2016	10.21
10.18A	<a href="#"><u>First Amendment to Lease, dated July 31, 2015, between the registrant and 400 Fairview LLC</u></a>	S-1	6/2/2016	10.21A
10.18B	<a href="#"><u>Second Amendment to Lease, dated March 4, 2016, between the registrant and 400 Fairview LLC</u></a>	S-1	6/2/2016	10.21B
10.18C	<a href="#"><u>Third Amendment to Lease, dated March 28, 2016, between the registrant and 400 Fairview LLC</u></a>	S-1	6/2/2016	10.21C
10.19	<a href="#"><u>Office Lease, dated November 17, 2004, between the registrant and Bedford Property Investors, Inc., as amended by the First Amendment to Lease, dated July 21, 2006, by and between the registrant and Fremont Lake Union Center LLC and the Second Amendment to Lease, dated December 11, 2009, by and between the registrant and Fremont Lake Union Center LLC</u></a>	S-1	6/2/2016	10.22
10.20†	<a href="#"><u>License Agreement, dated July 3, 2008, between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.24
10.21†	<a href="#"><u>Purchase Agreement—Services Phase 2, dated December 23, 2009, by and between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.25
10.22†	<a href="#"><u>Amendment No. 1 to Purchase Agreement—Services Phase 2, dated March 26, 2010, between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.26
10.23†	<a href="#"><u>Amendment No. 2 to Purchase Agreement—Services Phase 2, dated April 20, 2011, between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.27
10.24†	<a href="#"><u>Amendment No. 3 to Purchase Agreement—Services Phase 2, dated November 15, 2011, between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.28
10.25†	<a href="#"><u>Amendment No. 4 to Purchase Agreement—Services Phase 2, dated April 25, 2013, between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.29
10.26†	<a href="#"><u>Amendment No. 5 to Purchase Agreement—Services Phase 2, dated June 12, 2013, between the registrant and Intel Corporation</u></a>	S-1	6/2/2016	10.30

10.27+	<a href="#">Form of Notice of Restricted Stock Unit Grant and Restricted Stock Unit Agreement under the 2016 Equity Incentive Plan</a>	10-Q	8/14/2017	10.1
10.28†	<a href="#">First Amendment to Third Amended and Restated Loan and Security Agreement, by and between the registrant and Silicon Valley Bank, dated March 5, 2018</a>	10-Q	5/8/2018	10.1
10.29+	<a href="#">Separation Agreement, by and between the registrant and Evan Fein, dated March 30, 2018</a>	10-Q	5/8/2018	10.2
10.30	<a href="#">Letter Agreement, dated as of June 20, 2018, among Impinj, Inc., Sylebra HK Company Limited, Sylebra Capital Management and Daniel P. Gibson</a>	8-K	6/26/2018	10.1
10.31	<a href="#">Second Amendment to Third Amended and Restated Loan and Security Agreement, by and between the registrant and Silicon Valley Bank, dated August 17, 2018</a>	10-Q	10/29/2018	10.1
10.32+	<a href="#">Executive Employment Agreement, dated April 28, 2017, between the registrant and Jeff Dossett</a>			
21.1	<a href="#">Subsidiaries of the registrant</a>	S-1	6/2/2016	21.1

- 23.1 [Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm](#)
- 24.1 [Powers of Attorney \(contained on signature page\)](#)
- 31.1 [Certification of Principal Executive Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended](#)
- 31.2 [Certification of Principal Financial Officer Required Under Rule 13a-14\(a\) and 15d-14\(a\) of the Securities Exchange Act of 1934, as amended](#)
- 32.1\* [Certification of Principal Executive Officer Required Under Rule 13a-14\(b\) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350.](#)
- 32.2\* [Certification of Principal Financial Officer Required Under Rule 13a-14\(b\) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350.](#)

- 101.INS XBRL Instance Document
- 101.SCH XBRL Taxonomy Extension Schema Linkbase Document
- 101.CAL XBRL Taxonomy Extension Calculation Linkbase Document
- 101.DEF XBRL Taxonomy Extension Definition Linkbase Document
- 101.LAB XBRL Taxonomy Extension Label Linkbase Document
- 101.PRE XBRL Taxonomy Extension Presentation Linkbase Document

+ Indicates management contract or compensatory plan, contract or arrangement.

\* The certifications attached as Exhibits 32.1 and 32.2 that accompany this Quarterly Report on Form 10-K are not deemed filed with the Securities and Exchange Commission and are not to be incorporated by reference into any filing of Impinj, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Form 10-K, irrespective of any general incorporation language contained in such filing.

† Confidential treatment has been requested with respect to certain portions of this exhibit. Omitted portions have been filed separately with the Securities and Exchange Commission.

**Item 16. Form 10-K Summary**

None.

**SIGNATURES**

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

**Impinj, Inc.**

Date: February 28, 2019

By: /s/ Eric Brodersen  
**Eric Brodersen**  
*President and Chief Operating Officer (principal financial officer and duly authorized signatory)*

**POWER OF ATTORNEY**

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Chris Diorio, Ph.D. and Eric Brodersen, and each of them, with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file, any and all documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys-in-fact and agents or any of them or their and his or her substitute or substitutes, may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant in the capacities and in the capacities and on the dates indicated.

<b>Name</b>	<b>Title</b>	<b>Date</b>
<u>/s/Chris Diorio</u> <b>Chris Diorio, Ph.D.</b>	Chief Executive Officer and Vice Chair <i>(Principal Executive Officer)</i>	February 28, 2019
<u>/s/ Eric Brodersen</u> <b>Eric Brodersen</b>	President and Chief Operating Officer <i>(principal financial officer and duly authorized signatory)</i>	February 28, 2019
<u>/s/ Denise Masters</u> <b>Denise Masters</b>	VP Accounting <i>(Principal Accounting Officer)</i>	February 28, 2019
<u>/s/ Peter van Oppen</u> <b>Peter van Oppen</b>	Chair	February 28, 2019
<u>/s/ Tom A. Alberg</u> <b>Tom A. Alberg</b>	Director	February 28, 2019
<u>/s/ Clinton Bybee</u> <b>Clinton Bybee</b>	Director	February 28, 2019
<u>/s/ Gregory Sessler</u> <b>Gregory Sessler</b>	Director	February 28, 2019
<u>/s/ Theresa Wise</u> <b>Theresa Wise</b>	Director	February 28, 2019
<u>/s/ Daniel Gibson</u> <b>Daniel Gibson</b>	Director	February 28, 2019

## IMPINJ, INC.

## EXECUTIVE EMPLOYMENT AGREEMENT

This Executive Employment Agreement (the “**Agreement**”) is entered into as of April 28, 2017 (the “**Effective Date**”) by and between Jeff Dossett (“**Executive**”) and Impinj, Inc., a Delaware corporation (the “**Company**”), and sets forth the terms and conditions with respect to Executive’s employment with the Company during the Employment Term (as defined below).

NOW THEREFORE, in consideration of the mutual covenants contained herein, the Company and Executive agree as follows:

**AGREEMENT****1. Duties and Scope of Employment.**

- a. **Position and Duties.** Executive will serve as Senior Vice President of Marketing and Business Development and will report to the Company’s President and Chief Operating Officer. The duties and responsibilities of Executive shall include the duties and responsibilities for Executive’s corporate office and position as set forth in Company’s bylaws from time to time in effect and such other duties and responsibilities as Company’s President and Chief Operating Officer may from time to time reasonably assign to Executive, in all cases to be consistent with Executive’s corporate office and position. The period of Executive’s employment under this Agreement is referred to herein as the “**Employment Term**.”
  - b. **Obligations.** During the Employment Term, Executive will perform his duties faithfully and to the best of his ability and will devote his full business efforts and time to the Company. For the duration of the Employment Term, Executive agrees not to actively engage in any other employment, occupation or consulting activity for any direct or indirect remuneration without the prior approval of the Board of Directors or its authorized committee (in either case, the “**Board**”). Executive will not render commercial or professional services of any nature to any person or organization, whether or not for compensation, without the prior written consent of the Board. Notwithstanding the foregoing, nothing in this Agreement will prevent Executive from accepting speaking or presentation engagements in exchange for honoraria or from serving on boards of charitable organizations, provided that such activities do not materially interfere with Executive’s obligations to the Company as described above.
2. **At-Will Employment.** The parties agree that Executive’s employment with the Company will be “**at-will**” employment and may be terminated at any time with or without cause or notice. Executive understands and agrees that neither his job performance nor promotions, commendations, bonuses or the like from the Company give rise to or in any way serve as the basis for modification, amendment, or extension, by implication or otherwise, of his employment with the Company. However, as described in this Agreement, Executive may be entitled to severance benefits depending on the circumstances of Executive’s termination of employment with the Company.
  3. **Start Date.** Executive will commence employment on May 3, 2017 (the “**Start Date**”).
  4. **Compensation.**
    - a. **Base Salary.** During the Employment Term, the Company will pay Executive an annual salary of \$275,000 as compensation for his services (the “**Base Salary**”). The Base Salary will be paid periodically in accordance with the Company’s normal payroll practices, and will be subject to the usual, required withholding. Executive’s salary will be subject to review, and adjustments may be made based upon the Company’s normal performance review practices.
-

b. **Performance Bonus.** Executive shall be eligible to receive additional annual bonus compensation according to certain milestones and company performance metrics to be established by the Company and otherwise applicable to the Company's executive team (the "**Performance Bonus**"). Performance Bonus compensation shall target forty percent (40%) of Base Salary at one hundred percent (100%) achievement of the established milestones and performance metrics, and otherwise will be subject to the Company's annual Executive Bonus Plan. Performance Bonus compensation may be lower than forty percent (40%) of Base Salary if the performance targets are not met. The Company shall pay any actual Performance Bonus in no event later than March 15 of the calendar year following the calendar year to which the bonus is earned. Executive must be employed on the payment date to be eligible to receive his Performance Bonus. Executive's target Performance Bonus will be subject to review, and adjustments may be made based upon the Company's normal performance review practices. The Company reserves the right to modify and/or interpret all of its incentive compensation plans, including the Executive Bonus Plan, at any time.

c. **Equity.**

i. Subject to approval by the Board or its authorized designee, Executive will be granted an option to purchase 130,000 shares of Company common stock under the Company's 2016 Equity Incentive Plan (the "**2016 Plan**") at an exercise price equal to the fair market value of the shares on the date of grant as determined under the 2016 Plan. The option will vest as follows: 1/4<sup>th</sup> of the total number of shares shall vest on the one-year anniversary of the Start Date, and 1/48<sup>th</sup> of the total number of shares shall vest each month thereafter (on the same day of the month as the Start Date), in each case, so long as Executive remains a Service Provider (as defined in the 2016 Plan), so that all shares subject to the option shall have vested after 48 months following the Start Date.

ii. The option will be subject to the terms of the 2016 Plan and the standard Stock Option Agreement (except as contemplated by this Agreement) (the "**Stock Agreements**"), and further subject to applicable federal and state securities laws.

d. **Employee Benefits.** During the Employment Term, Executive will be entitled to participate in the employee benefit plans currently and hereafter maintained by the Company of general applicability to other senior executives of the Company, including, without limitation, the Company's group medical, dental, vision, life insurance, and disability plans. The Company reserves the right to cancel or change the benefit plans and programs it offers to its employees at any time.

e. **Paid Time Off.** During the Employment Term, Executive will be entitled to paid time off under the Company's Open Paid-Time Off (PTO) policy, which provides for mutually and reasonably agreed upon paid time off and is subject to change at the discretion of the Company.

5. **Severance.**

a. **Termination for other than Cause, Death or Disability or Resignation for Good Reason Apart from Change of Control.** If, after 90 days following Executive's Start Date, and prior to a Change of Control or after twelve (12) months following a Change of Control (1) the Company terminates Executive's employment with the Company other than for Cause, death or Disability, or (2) Executive resigns from his employment with the Company for Good Reason, then, subject to Section 6, Executive will be entitled to:

i. continuing payments of severance pay at a rate equal to his Base Salary, as then in effect, for six (6) months from the date of such termination in accordance with the Company's normal payroll policies and subject to the usual, required withholding,

- ii. reimbursement of Executive's expenses in continuing group health insurance coverage for himself and his eligible covered dependents under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("COBRA"), for up to six (6) months, provided Executive makes a timely election for and continues to be eligible for such continued coverage; provided, however, that if the Company determines in its sole discretion that it cannot make the COBRA reimbursements without potentially violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), the Company will in lieu thereof provide to Executive a taxable monthly payment in an amount equal to the monthly COBRA premium that Executive would be required to pay to continue Executive's group health coverage in effect on the date of Executive's termination of employment (which amount will be based on the premium for the first month of COBRA coverage), which payments will be made regardless of whether Executive elects COBRA continuation coverage and will commence on the month following Executive's termination of employment and will end on the earlier of (x) the date upon which Executive obtains other employment or (y) the date the Company has paid an amount equal to six (6) payments, and
  - iii. such portion of that year's Performance Bonus, if applicable, as Executive shall have earned (if any) as of the date of such termination, as determined in good faith by the Board, which amount shall be subject to the usual, required withholding.
- b. **Termination for other than Cause, Death or Disability or Resignation for Good Reason Following a Change of Control.** If within twelve (12) months following a Change of Control (1) the Company terminates Executive's employment with the Company other than for Cause, death or Disability, or (2) Executive resigns from his employment with the Company for Good Reason, then, subject to Section 6, Executive will be entitled to:
- i. continuing payments of severance pay at a rate equal to his Base Salary rate, as then in effect, for six (6) months from the date of such termination in accordance with the Company's normal payroll policies and subject to the usual, required withholding,
  - ii. reimbursement of Executive's expenses in continuing group health insurance coverage for himself and his eligible covered dependents under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("COBRA"), for up to six (6) months, provided Executive makes a timely election for and continues to be eligible for such continued coverage; provided, however, that if the Company determines in its sole discretion that it cannot make the COBRA reimbursements without potentially violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), the Company will in lieu thereof provide to Executive a taxable monthly payment in an amount equal to the monthly COBRA premium that Executive would be required to pay to continue Executive's group health coverage in effect on the date of Executive's termination of employment (which amount will be based on the premium for the first month of COBRA coverage), which payments will be made regardless of whether Executive elects COBRA continuation coverage and will commence on the month following Executive's termination of employment and will end on the earlier of (x) the date upon which Executive obtains other employment or (y) the date the Company has paid an amount equal to six (6) payments,
  - iii. such portion of that year's Performance Bonus, if applicable, as Executive shall have earned (if any) as of the date of such termination, which amount shall be subject to the usual, required withholding, and
  - iv. accelerated vesting of all outstanding Company equity awards as to one-hundred percent (100%) of the then unvested portion of any such Company equity award.

- c. **Termination for Cause, Death or Disability; Resignation without Good Reason**. If Executive's employment with the Company terminates voluntarily by Executive (except upon resignation for Good Reason), for Cause by the Company or due to Executive's death or Disability, then
- i. all vesting will terminate immediately with respect to Executive's outstanding Company equity awards, and
  - ii. all payments of compensation by the Company to Executive hereunder will terminate immediately (except as to amounts already earned, including such portion of that year's Performance Bonus as Executive shall have earned (if any) as of the date of such termination, as determined in good faith by the Board).
6. **Conditions to Receipt of Severance; No Duty to Mitigate**.
- a. **Separation Agreement and Release of Claims**. The continued payment of salary set forth in Section 5(a) shall be contingent upon Executive signing and not revoking the Company's standard release of claims agreement upon termination and provided that such release becomes effective no later than 120 days following the termination date or such earlier date required by the release agreement (such deadline, the "**Release Deadline**"). If the release does not become effective by the Release Deadline, Executive will forfeit any rights to severance or benefits under this Agreement. In no event will severance payments or benefits be paid or provided until the release actually becomes effective. In the event the termination occurs at a time during the calendar year where the release could become effective in the calendar year following the calendar year in which Executive's termination occurs, then any severance payments or benefits under this Agreement that would be considered Payments (as defined in Section 6(d)) will be paid on the first payroll date to occur during the calendar year following the calendar year in which such termination occurs, or, if later,
    - i. the Release Deadline,
    - ii. such time as required by the payment schedule applicable to each payment or benefit as set forth in Section 5, or
    - iii. such time as required by Section 6(d)(ii).
  - b. **Noncompete**. Executive acknowledges that the nature of the Company's business is such that if Executive were to become employed by, or substantially involved in, the business of a competitor of the Company following the termination of Executive's employment with the Company, it would be very difficult for Executive not to rely on or use the Company's trade secrets and confidential information. Thus, to avoid the inevitable disclosure of the Company's trade secrets and confidential information and other protectible interests, Executive agrees and acknowledges that Executive's right to receive the severance payments set forth in Section 5(a) (to the extent Executive is otherwise entitled to such payments) will be conditioned upon Executive not directly or indirectly engaging in (whether as an employee, consultant, agent, proprietor, principal, partner, stockholder, corporate officer, director or otherwise), nor having any ownership interest in or participating in the financing, operation, management or control of, any person, firm, corporation or business that competes with Company (or any parent or subsidiary of the Company) or is a customer of the Company (or any parent or subsidiary of the Company) provided, however, that that nothing in this Section 6(b) will prevent Executive from owning as a passive investment less than 1% of the outstanding shares of the capital stock of a publicly-held corporation if such shares are actively traded on a national stock exchange or similar market or medium. Upon any breach of this section, all severance payments and post-termination benefits pursuant to Section 5 will immediately cease and Executive will be able to exercise his vested stock options to acquire Company common stock through the longer of:
    - i. thirty (30) days following the commencement of such competition, and



- ii. such period of time as originally set forth in his option agreement (without taking into effect the one-year extended post-termination exercise period set forth in Section 5) to exercise any stock options or other similar rights to acquire Company common stock.
- c. **Non-Solicitation**. The receipt of any severance benefits pursuant to this Agreement will be subject to Executive not violating the provisions of Section 9. In the event Executive breaches the provisions of Section 9, all continuing payments and benefits to which Executive may otherwise be entitled pursuant to Section 5 will immediately cease and Executive will have the longer of
  - i. thirty (30) days following the commencement of such competition, and
  - ii. such period of time as originally set forth in his award agreement to exercise any stock options or other similar rights to acquire Company common stock.
- d. **Section 409A**.
  - i. Notwithstanding anything to the contrary in this Agreement, no severance pay or benefits payable upon separation that is payable to Executive, if any, pursuant to this Agreement, when considered together with any other severance payments or separation benefits that are considered deferred compensation (together, the “**Payments**”) under Section 409A will be payable until Executive has a “separation from service” within the meaning of Section 409A.
  - ii. Notwithstanding anything to the contrary in this Agreement, if Executive is a “specified employee” within the meaning of Section 409A at the time of Executive’s termination of employment, then, if required, the Payments, which are otherwise due to Executive on or within the six (6) month period following Executive’s termination will accrue, to the extent required, during such six (6) month period and will become payable in a lump sum payment on the date six (6) months and one (1) day following the date of Executive’s termination of employment or the date of Executive’s death, if earlier. All subsequent Payments, if any, will be payable in accordance with the payment schedule applicable to each payment or benefit.
  - iii. Any amounts paid under this Agreement that satisfy the requirements of the “short- term deferral” rule set forth in Section 1.409A-1(b)(4) of the Treasury Regulations will not constitute Payments for purposes of clause (i) above.
  - iv. Each payment and benefit payable under the Agreement is intended to constitute a separate payment for purposes of Section 1.409A-2(b)(2) of the Treasury Regulations.
  - v. Any amount paid under this Agreement that qualifies as a payment made as a result of an involuntary separation from service pursuant to Section 1.409A-1(b)(9)(iii) of the Treasury Regulations that does not exceed the Section 409A Limit (as defined below) will not constitute a Payment for purposes of clause (i) above.
  - vi. The foregoing provisions are intended to be exempt from or comply with the requirements of Section 409A so that none of the severance payments and benefits to be provided hereunder will be subject to the additional tax imposed under Section 409A, and any ambiguities herein will be interpreted to so comply. The Company and Executive agree to work together in good faith to consider amendments to this Agreement and to take such reasonable actions which are necessary, appropriate or desirable to avoid imposition of any additional tax or income recognition prior to actual payment to Executive under Section 409A.
- e. **No Duty to Mitigate**. Executive will not be required to mitigate the amount of any payment contemplated by this Agreement, nor will any earnings that Executive may receive from any other source reduce any such payment.

- f. **Section 280G**. In the event that the payments under this Agreement or otherwise payable to you constitute “ **parachute payments** ” within the meaning of Section 280G of the Code and (ii) but for this Section 6(f), would be subject to the excise tax imposed by Section 4999 of the Code, then Executive’s benefits hereunder shall be payable either:
- i. in full or
  - ii. as to such lesser amount which would result in no portion of such severance benefits being subject to excise tax under Section 4999 of the Code, whichever of the foregoing amounts, taking into account the applicable federal, state and local income taxes and the excise tax imposed by Section 4999, results in the receipt by Executive on an after-tax basis, of the greatest amount of benefits hereunder, notwithstanding that all or some portion of such benefits may be taxable under Section 4999 of the Code.

Unless the Company and Executive agree in writing, any determination required under this Section 6(f) shall be made in writing by the public accountants designated by the Company. If the amount of the aggregate payments or property transferred to Executive must be reduced under this Section 6(f), then the reduction in payments and/or benefits shall occur in the following order: (1) reduction of cash payments, if any; (2) cancellation of accelerated vesting of equity awards, if any; and (3) reduction of other benefits, if any, paid to Executive.

7. **Definitions.**

- a. **Cause**. For purposes of this Agreement, “ **Cause** ” is defined as, in the Company’s reasoned discretion:
- i. Executive’s conviction of a felony or gross misdemeanor, or the Company’s belief Executive has done so;
  - ii. Executive’s commission of any act of fraud or dishonesty with respect to the Company;
  - iii. Executive’s intentional misconduct that has a materially adverse effect upon the Company’s business;
  - iv. Executive’s breach of any of Executive’s fiduciary obligations as an officer of the Company or of any contractual obligation that Executive has to the Company, in either case where the breach has a materially adverse effect on the Company’s business;
  - v. Executive’s willful misconduct or gross negligence in performance of Executive’s duties hereunder, including Executive’s refusal to comply in any material respect with the legal directives of the Board so long as such directives are not inconsistent with Executive’s position and duties, or
  - vi. Executive’s death or Disability.

However, prior to any termination of Executive’s employment for Cause defined in clauses (iii), (iv) or (v) above, the Company shall give written notice to Executive of the actions or omissions deemed to constitute the Cause event, and if it is possible to cure the specified default, Executive shall have a period of not less than thirty (30) days in which to cure the specified default in Executive’s performance.

- b. **Change of Control**. For purposes of this Agreement, “ **Change of Control** ” of the Company shall have the same meaning as given “Change in Control” in the 2016 Plan.
- c. **Code**. For purposes of this Agreement, “ **Code** ” means the Internal Revenue Code of 1986, as amended.

- d. **Disability**. For purposes of this Agreement, “**Disability**” means Executive’s inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than three months, or such longer period as may be required under applicable law. Executive shall not be considered disabled unless Executive furnishes proof in such form or manner, and at such times, as the Company may require.
- e. **Good Reason**. For the purposes of this Agreement, “**Good Reason**” means Executive’s resignation that is effective within two (2) years following the occurrence of any Company cure period (discussed below) one or more of the following events without Executive’s consent:
- i. a material reduction of Executive’s Base Salary (for purposes of this Agreement, the reduction of Base Salary by less than 10% from Executive’s then present Base Salary shall not be considered a material reduction), provided that an across-the-board reduction in the salary level of all other senior executives by the same percentage amount as part of a general salary level reduction shall not constitute such a material reduction;
  - ii. the assignment to Executive of any duties, or the reduction of Executive’s duties, either of which results in a material diminution in Executive’s authority, duties or responsibilities with the Company in effect immediately prior to such assignment or reduction, or the removal of Executive from such position and responsibilities, unless Executive is provided with comparable authority, duties or responsibilities; provided that, neither a mere change in title alone nor reassignment following a Change of Control to a position that is substantially similar to the position held prior to the Change of Control in terms of job duties, responsibilities and requirements shall constitute a material reduction in job responsibilities; or
  - iii. a material change in the geographic location at which Executive must perform services (for purposes of this Agreement, the relocation of Executive to a facility or a location less than 50 miles from Executive’s then-present location shall not be considered a material change in geographic location).

Executive will not resign for “Good Reason” without first providing the Company with written notice of the acts or omissions constituting the grounds for “Good Reason” within 90 days of the initial existence of the grounds for “Good Reason” and a reasonable cure period of not less than 30 days following the date of such notice.

- f. **Section 409A Limit**. For purposes of this Agreement, “**Section 409A Limit**” means the lesser of two times:
- i. Executive’s annualized compensation based upon the annual rate of pay paid to Executive during Executive’s taxable year preceding Executive’s taxable year of Executive’s termination of employment as determined under Treasury Regulation 1.409A-1(b)(9)(iii)(A)(I) and any Internal Revenue Service guidance issued with respect thereto; or
  - ii. the maximum amount that may be taken into account under a qualified plan pursuant to Section 401(a)(17) of the Code for the year in which Executive’s employment is terminated.
8. **Confidential Information**. Executive agrees to maintain his obligations under the Company’s standard Proprietary Information and Inventions Agreement, attached hereto as **Exhibit A**, dated on even date herewith (the “**Proprietary Information Agreement**”).

9. **Non-Solicitation**. Until the date one year after the termination of Executive's employment with the Company for any reason, Executive agrees not, either directly or indirectly, to solicit, induce, attempt to hire, recruit, encourage, take away, hire any employee of the Company (or any parent or subsidiary of the Company) or cause an employee to leave his employment either for Executive or for any other entity or person. The hiring of an individual violates this paragraph regardless of who initiated contact. Executive represents that he (a) is familiar with the foregoing covenant not to solicit, and (b) is fully aware of his obligations hereunder, including, without limitation, the reasonableness of the length of time, scope and geographic coverage of these covenants.
10. **Assignment**. This Agreement will be binding upon and inure to the benefit of (a) the heirs, executors and legal representatives of Executive upon Executive's death and (b) any successor of the Company. Any such successor of the Company will be deemed substituted for the Company under the terms of this Agreement for all purposes. For this purpose, "**successor**" means any person, firm, corporation or other business entity which at any time, whether by purchase, merger or otherwise, directly or indirectly acquires all or substantially all of the assets or business of the Company. None of the rights of Executive to receive any form of compensation payable pursuant to this Agreement may be assigned or transferred except by will or the laws of descent and distribution. Any other attempted assignment, transfer, conveyance or other disposition of Executive's right to compensation or other benefits will be null and void.
11. **Notices**. All notices, requests, demands and other communications called for hereunder will be in writing and will be deemed given (a) on the date of delivery if delivered personally, (b) 1 day after being sent by a well-established commercial overnight service, or (c) four (4) days after being mailed by registered or certified mail, return receipt requested, prepaid and addressed to the parties or their successors at the following addresses, or at such other addresses as the parties may later designate in writing:
- |                    |  |
|--------------------|--|
| If to the Company: | Impinj, Inc.<br>400 Fairview Ave. N., Suite 1200<br>Seattle, Washington 98104<br>Attn: General Counsel |
| If to Executive:   | at the last residential address known by the Company.  |
12. **Severability**. In the event that any provision hereof becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Agreement will continue in full force and effect without said provision.
13. **Arbitration**. In consideration of Executive's employment with the Company, its promise to arbitrate all employment-related disputes and his receipt of the compensation, pay raises and other benefits paid to him by the Company, at present and in the future, Executive agrees that any and all controversies, claims, or disputes with anyone (including the Company and any employee, officer, director, shareholder or benefit plan of the Company in their capacity as such or otherwise) arising out of, relating to, or resulting from Executive's employment with the Company or the termination of Executive's employment with the Company, including any breach of this Agreement, will be subject to binding arbitration under the National Rules for the Resolution of Employment Disputes, supplemented by the Washington Code of Civil Procedure (the "**Rules**") and pursuant to Washington law, except as permitted by law. Disputes which Executive agrees to arbitrate, and thereby agrees to waive any right to a trial by jury, include any statutory claims under state or federal law, including, but not limited to, claims under Title VII of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, the Age Discrimination in Employment Act of 1967, the Older Workers Benefit Protection Act, the Worker Adjustment and Retraining Notification Act, the Family and Medical Leave Act, the Washington Law Against Discrimination, claims of harassment, discrimination or wrongful termination and any statutory

claims. Executive further understands that this Agreement to arbitrate also applies to any disputes that the Company may have with him.

- a. **Procedure**. Executive agrees that any arbitration will take place in Seattle, Washington and be administered by the American Arbitration Association (“AAA”) and that the neutral arbitrator will be selected in a manner consistent with its National Rules for the Resolution of Employment Disputes. Executive agrees that the arbitrator will have the power to decide any motions brought by any party to the arbitration, including motions for summary judgment and/or adjudication and motions to dismiss and demurrers, prior to any arbitration hearing. Executive also agrees that the arbitrator will have the power to award any remedies, including attorneys’ fees and costs, available under applicable law. Executive understands that the Company will pay for any administrative or hearing fees charged by the arbitrator or AAA except that Executive will pay the first \$125.00 of any filing fees associated with any arbitration Executive initiates. Executive agrees that the arbitrator will administer and conduct any arbitration in a manner consistent with the Rules and that to the extent that the AAA’s National Rules for the Resolution of Employment Disputes conflict with the Rules, the Rules will take precedence. Executive agrees that the decision of the arbitrator will be in writing.
  - b. **Remedy**. Except as provided by this Agreement, applicable law, and by the Rules, including any provisional relief offered therein, arbitration will be the sole, exclusive and final remedy for any dispute between Executive and the Company. Accordingly, except as provided for by the Rules, applicable law, and this Agreement, neither Executive nor the Company will be permitted to pursue court action regarding claims that are subject to arbitration. Notwithstanding, the arbitrator will not have the authority to disregard or refuse to enforce any lawful Company policy, and the arbitrator will not order or require the Company to adopt a policy not otherwise required by law which the Company has not adopted.
  - c. **Administrative Relief**. Executive understands that this Agreement does not prohibit him from pursuing an administrative claim with a local, state or federal administrative body such as the Department of Fair Employment and Housing, the Equal Employment Opportunity Commission or the workers’ compensation board. This Agreement does, however, preclude Executive from pursuing court action regarding any such claim, except as permitted by law.
  - d. **Voluntary Nature of Agreement**. Executive acknowledges and agrees that Executive is executing this Agreement voluntarily and without any duress or undue influence by the Company or anyone else. Executive further acknowledges and agrees that Executive has carefully read this Agreement and that Executive has asked any questions needed for Executive to understand the terms, consequences and binding effect of this Agreement and fully understands it, including that Executive *is waiving Executive’s right to a jury trial*. Finally, Executive agrees that Executive has been provided an opportunity to seek the advice of an attorney of Executive’s choice before signing this Agreement.
14. **Integration**. This Agreement, together with any Company equity plans and equity agreements, the Stock Agreements, and the Proprietary Information Agreement, represents the entire agreement and understanding between the parties as to the subject matter herein and supersedes all prior or contemporaneous agreements whether written or oral. This Agreement may be modified only by agreement of the parties by a written instrument executed by the parties that is designated as an amendment to this Agreement.
  15. **Waiver of Breach**. The waiver of a breach of any term or provision of this Agreement, which must be in writing, will not operate as or be construed to be a waiver of any other previous or subsequent breach of this Agreement.
  16. **Headings**. All captions and section headings used in this Agreement are for convenient reference only and do not form a part of this Agreement.

17. **Tax Withholding**. All payments made pursuant to this Agreement will be subject to withholding of applicable taxes.
18. **Governing Law**. This Agreement will be governed by the laws of the State of Washington except for its conflict of laws' provisions. Venue for any dispute will be Seattle, Washington.
19. **Acknowledgment**. Executive acknowledges that he has had the opportunity to discuss this matter with and obtain advice from his private attorney, has had sufficient time to, and has carefully read and fully understands all the provisions of this Agreement, and is knowingly and voluntarily entering into this Agreement.
20. **Counterparts**. This Agreement may be executed in counterparts, and each counterpart will have the same force and effect as an original and will constitute an effective, binding agreement on the part of each of the undersigned.

*[The space below intentionally left blank.]*

IN WITNESS WHEREOF, each of the parties has executed this Agreement, in the case of the Company by their duly authorized officers, as of the day and year first above written.

**Impinj, Inc.**

By: /s/ Eric Brodersen  
Eric Brodersen  
President and Chief Operating Officer

**Jeff Dossett**

By: /s/ Jeff Dossett  
Executive

## Exhibit A

**Proprietary Information and Inventions Agreement  
Impinj, Inc.**

In exchange for my becoming employed by Impinj, Inc. or any of its current or future subsidiaries, affiliates, successors, or assigns (collectively, the “**Company**”), and for any cash and equity compensation for my services, I hereby agree as follows:

1. **Confidentiality Obligation**. I understand and agree that all Proprietary Information (as defined in Section 6 shall be the sole property of the Company and its assignees, including all trade secrets, patents, copyrights and other rights in connection therewith. I hereby assign to the Company any rights I may acquire in such Proprietary Information. I will hold in confidence and not directly or indirectly use or disclose, both during my employment by or consulting relationship with the Company and for a period of five (5) years after its termination (irrespective of the reason for such termination), any Proprietary Information I obtain or create during the period of my employment or consulting relationship, whether or not during working hours, except to the extent authorized by the Company, until such Proprietary Information becomes generally known. I agree not to make copies of such Proprietary Information except as authorized by the Company. Upon termination of my employment or consulting relationship or upon an earlier request by the Company, I will return or deliver to the Company all tangible forms of such Proprietary Information in my possession or control, including but not limited to drawings, specifications, documents, records, devices, models or any other material and copies or reproductions thereof. This agreement and my obligations under it are independent of my continued service with the Company and I promise to keep all Confidential Information secret after the termination, for any reason, of my employment from the Company.
  2. **Ownership of Physical Property**. All documents, apparatus, equipment and other physical property in any form, whether or not pertaining to Proprietary Information, furnished to me by the Company or produced by me or others in connection with my employment or consulting relationship shall be and remain the sole property of the Company. I shall return to the Company all such documents, materials and property as and when requested by the Company, except only (i) my personal copies of records relating to my compensation; (ii) if applicable, my personal copies of any materials evidencing shares of the Company’s capital stock purchased by me and options to purchase shares of the Company’s capital stock granted to me; (iii) my copy of this Agreement and (iv) my personal property and personal documents I bring with me to the Company and any personal correspondence and personal materials that I accumulate and keep at my office during my employment (my “Personal Documents”). Even if the Company does not so request, I shall return all such documents, materials and property upon termination of my employment or consulting relationship, and, except for my Personal Documents, I will not take with me any such documents, material or property or any reproduction thereof upon such termination. In the event of the termination of the Relationship, I agree to sign and deliver the “**Termination Certification**” attached hereto as **Exhibit A-2**; however, my failure to sign and deliver the Termination Certificate shall in no way diminish my continuing obligations under this Agreement.
  3. Assignment of Inventions
    - a. Without further compensation, I hereby agree to promptly disclose to the Company, all Inventions (as defined below) which I may solely or jointly develop or reduce to practice during the period of my employment or consulting relationship with the Company which (i) pertain to any line of business activity of the Company, (ii) are aided by the use of time, material or facilities of the Company, whether or not during working hours or (iii) relate to any of my work during the period of my employment or consulting relationship with the Company, whether or not during normal working hours (“Company Inventions”). During the term of my employment or consultancy, all Company Inventions that I conceive, reduce to practice, develop or have developed (in whole or in part, either alone or jointly with others) shall be the sole property of the Company and its
-



assignees to the maximum extent permitted by law (and to the fullest extent permitted by law shall be deemed “works made for hire”), and the Company and its assignees shall be the sole owner of all patents, copyrights, trademarks, trade secrets and other rights in connection therewith. I hereby assign to the Company any rights that I may have or acquire in such Company Inventions.

- b. I attach hereto as **Exhibit A**, a complete list of all Inventions, if any, made by me prior to my employment or consulting relationship with the Company that are relevant to the Company’s business, and I represent and warrant that such list is complete. If no such list is attached to this Agreement, I represent that I have no such Inventions at the time of signing this Agreement. If in the course of my employment or consultancy (as the case may be) with the Company, I use or incorporate into a product or process an Invention not covered by Section 4(a) of this Agreement in which I have an interest, the Company is hereby granted a nonexclusive, fully paid-up, royalty-free, perpetual, worldwide license of my interest to use and sublicense such Invention without restriction of any kind.

NOTICE REQUIRED BY REVISED CODE OF WASHINGTON 49.44.140 :

Any assignment of Inventions required by this Agreement does not apply to an Invention for which no equipment, supplies, facility or trade secret information of the Company was used and which was developed entirely on the employee’s own time, unless (a) the Invention relates (i) directly to the business of the Company or (ii) to the Company’s actual or demonstrably anticipated research or development or (b) the Invention results from any work performed by the employee for the Company.

4. **Further Assistance; Power of Attorney.** I agree to perform, during and after my employment or consulting relationship, all acts deemed necessary or desirable by the Company to permit and assist it, at its expense, in obtaining and enforcing the full benefits, enjoyment, rights and title throughout the world in the Inventions assigned to the Company as set forth in Section 4 above. Such acts may include, but are not limited to, execution of documents and assistance or cooperation in legal proceedings. I hereby irrevocably designate the Company and its duly authorized officers and agents as my agent and attorney-in fact, to execute and file on my behalf any such applications and to do all other lawful acts to further the prosecution and issuance of patents, copyright and mask work registrations related to such Inventions. This power of attorney shall not be affected by my subsequent incapacity.
5. **Inventions.** As used in this Agreement, the term “**Inventions**” means discoveries, developments, concepts, designs, ideas, know-how, improvements, inventions, trade secrets and/or original works of authorship, whether or not patentable, copyrightable or otherwise legally protectable. This includes, but is not limited to, any new product, machine, article of manufacture, biological material, method, procedure, process, technique, use, equipment, device, apparatus, system, compound, formulation, composition of matter, design or configuration of any kind, or any improvement thereon.
6. **Proprietary Information.** As used in this Agreement, the term “**Proprietary Information**” means information or physical material not generally known or available outside the Company or information or physical material entrusted to the Company by third parties. This includes, but is not limited to, Inventions, confidential knowledge, copyrights, product ideas, techniques, processes, formulas, object codes, mask works and/or any other information of any type relating to documentation, laboratory notebooks, data, schematics, algorithms, flow charts, mechanisms, research, manufacture, improvements, assembly, installation, marketing, forecasts, sales, pricing, customers, the salaries, duties, qualifications, performance levels and terms of compensation of other employees, and cost or other financial data concerning any of the foregoing for the Company and its operations. Proprietary Information may be contained in material such as drawings, samples, procedures, specifications, reports, studies, customer or supplier lists, budgets, cost or price lists, compilations or computer programs, or may be in the nature of unwritten knowledge or know-how.

7. **Protected Activity Not Prohibited**. I agree that nothing in this Agreement limits or prohibits me from filing a charge or complaint with, or otherwise communicating or cooperating with or participating in any investigation or proceeding that may be conducted by, any federal, state or local government agency or commission, including the Securities and Exchange Commission, the Equal Employment Opportunity Commission, the Occupational Safety and Health Administration, and the National Labor Relations Board (“**Government Agencies**”), including disclosing documents or other information as permitted by law, without giving notice to, or receiving authorization from, the Company. Notwithstanding, in making any such disclosures or communications, I agree to take all reasonable precautions to prevent any unauthorized use or disclosure of any information that may constitute Proprietary Information to any parties other than the Government Agencies. I further understand that I am not permitted to disclose the Company’s attorney-client privileged communications or attorney work product. In addition, I hereby acknowledge that the Company has provided me with notice in compliance with the Defend Trade Secrets Act of 2016 regarding immunity from liability for limited disclosures of trade secrets. The full text of the notice is attached in **Exhibit A-3**.
8. **No Conflicts**. I represent that my performance of all the terms of this Agreement as an employee of or consultant to the Company does not and will not breach any agreement to keep in confidence proprietary information, knowledge or data acquired by me in confidence or in trust prior to my becoming an employee or consultant of the Company, and I will not disclose to the Company, or induce the Company to use, any confidential or proprietary information or material belonging to any previous employer or others. I agree not to enter into any written or oral agreement that conflicts with the provisions of this Agreement.
9. **No Interference**. I certify that, to the best of my information and belief, I am not a party to any other agreement that will interfere with my full compliance with this Agreement.
10. **Effects of Agreement**. This Agreement (a) shall survive for a period of five (5) years beyond the termination of my employment by or consulting relationship with the Company, (b) inures to the benefit of successors and assigns of the Company and (c) is binding upon my heirs and legal representatives.
11. **Injunctive Relief**. I acknowledge that violation of this Agreement by me may cause irreparable injury to the Company, and I agree that the Company will be entitled to seek extraordinary relief in court, including, but not limited to, temporary restraining orders, preliminary injunctions and permanent injunctions without the necessity of posting a bond or other security and without prejudice to any other rights and remedies that the Company may have for a breach of this Agreement.
12. **Miscellaneous**. This Agreement supersedes any oral, written or other communications or agreements concerning the subject matter of this Agreement, and may be amended or waived only by a written instrument signed by me and the Chief Executive Officer of the Company. This Agreement shall be governed by the laws of the State of Washington applicable to contracts entered into and performed entirely within the State of Washington, without giving effect to principles of conflict of laws. If any provision of this Agreement is held to be unenforceable under applicable law, then such provision shall be excluded from this Agreement only to the extent unenforceable, and the remainder of such provision and of this Agreement shall be enforceable in accordance with its terms.
13. **Acknowledgment**. I certify and acknowledge that I have carefully read all of the provisions of this Agreement and that I understand and will fully and faithfully comply with such provisions.

**Impinj, Inc.**

By: /s/ Eric Brodersen  
Eric Brodersen  
President and Chief Operating Officer

**Jeff Dossett**

By: /s/ Jeff Dossett  
Executive

**Exhibit A-1**

Impinj, Inc.  
400 Fairview Ave. N., Suite 1200  
Seattle, WA 98104

1. The following is a complete list of all Inventions relevant to the subject matter of my employment by the Company that have been made or conceived or first reduced to practice by me, alone or jointly with others or which have become known to me prior to my employment by the Company. I represent that such list is complete.

Jeff Dossett

2. I propose to bring to my employment or consultancy the following materials and documents of a former employer:

No material or documents.

See below:

**Jeff Dossett**

By: /s/ Jeff Dossett

Dated: 4/28/2017

**Exhibit A-2**  
**Termination Certification**

This is to certify that I do not have in my possession, nor have I failed to return, any devices, records, data, notes, reports, proposals, lists, correspondence, specifications, drawings, blueprints, sketches, laboratory notebooks, flow charts, materials, equipment, other documents or property, or copies or reproductions of any aforementioned items belonging to Impinj, Inc., its subsidiaries, affiliates, successors or assigns (together the “**Company**”).

I further certify that I have complied with all the terms of the Company’s Proprietary Information and Invention Assignment Agreement signed by me, including the reporting of any inventions and original works of authorship (as defined therein), conceived or made by me (solely or jointly with others) covered by that agreement.

I further agree that, in compliance with the Proprietary Information and Invention Assignment Agreement, I will preserve as confidential all trade secrets, confidential knowledge, data or other proprietary information relating to products, processes, know-how, designs, formulas, developmental or experimental work, computer programs, data bases, other original works of authorship, customer lists, business plans, financial information or other subject matter pertaining to any business of the Company or any of its employees, clients, consultants or licensees.

I further agree that for one (1) year from the date of this Certificate, I shall not either directly or indirectly solicit, induce, recruit or encourage any of the Company’s employees or consultants to terminate their relationship with the Company, or attempt to solicit, induce, recruit, encourage or take away employees or consultants of the Company, either for myself or for any other person or entity. Further, I shall not at any time use any Confidential Information of the Company to negatively influence any of the Company’s clients or customers from purchasing Company products or services or to solicit or influence or attempt to influence any client, customer or other person either directly or indirectly, to direct him or its purchase of products and/or services to any person, firm, corporation, institution or other entity in competition with the business of the Company.

**Jeff Dossett**

By: [To be signed at termination]  
Dated: \_\_\_\_\_

**Exhibit A-3**  
**Section 7 of the Defend Trade Secrets Act of 2016**

“ . . . An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that—(A) is made—(i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. An individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual—(A) files any document containing the trade secret under seal; and (B) does not disclose the trade secret, except pursuant to court order.”

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-224842, 333-216620 and 333-212620) of Impinj, Inc. of our report dated February 28, 2019 relating to the financial statements, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP  
Seattle, Washington  
February 28, 2019

## CERTIFICATIONS

I, Chris Diorio, Ph.D., certify that:

1. I have reviewed this Annual Report on Form 10-K of Impinj, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the small business issuer as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
  - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 28, 2019

*/s/ Chris Diorio*

Chris Diorio, Ph.D.

*Chief Executive Officer*

*(Principal Executive Officer)*

## CERTIFICATIONS

I, Eric Brodersen , certify that:

1. I have reviewed this Annual Report on Form 10-K of Impinj, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the small business issuer as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
  - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 28, 2019

*/s/ Eric Brodersen*

Eric Brodersen

*President and Chief Operating Officer*

*(principal financial officer and duly authorized signatory)*



**IMPINJ, INC.**  
**CERTIFICATION PURSUANT TO**  
**18 U.S.C. SECTION 1350,**  
**AS ADOPTED PURSUANT TO**  
**SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Impinj, Inc. (the "Company") on Form 10-K for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Chris Diorio, Ph.D., Chief Executive Officer (*Principal Executive Officer*) of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

*/s/ Chris Diorio*

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Chris Diorio, Ph.D.  
*Chief Executive Officer*  
*(Principal Executive Officer)*

February 28, 2019

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

This certification accompanies the Report to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Impinj, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Report), irrespective of any general incorporation language contained in such filing.

**IMPINJ, INC.**  
**CERTIFICATION PURSUANT TO**  
**18 U.S.C. SECTION 1350,**  
**AS ADOPTED PURSUANT TO**  
**SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Impinj, Inc. (the "Company") on Form 10-K for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Eric Brodersen, President and Chief Operating Officer (*Principal Financial Officer*) of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

*/s/ Eric Brodersen*

Eric Brodersen

*President and Chief Operating Officer*

*(principal financial officer and duly authorized signatory)*

February 28, 2019

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

This certification accompanies the Report to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Impinj, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Report), irrespective of any general incorporation language contained in such filing.