UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2018

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission File Number: 001-37956

XPERI CORPORATION
(Exact Name of Registrant as Specified in Its Charter)

Delaware	**81- 4465732**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**
3025 Orchard Parkway, San Jose, California	**95134**
(Address of Principal Executive Offices)	**(Zip Code)**

(408) 321-6000
(Registrant's Telephone Number, Including Area Code)

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

Title of each class	Name of each exchange on which registered
Common stock, par value $0.001 per share	**The Nasdaq Global Select Market**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Securities Exchange 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 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 definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act:

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Securities Exchange Act). Yes ☐ No ☒

The aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of June 30, 2018 was $463,642,793 (based on the closing sale price of the registrant's common stock as reported on The Nasdaq Global Select Market).

The number of shares outstanding of the registrant's common stock as of February 4, 2019 was 48,652,499.

DOCUMENTS INCORPORATED BY REFERENCE:

Portions of the registrant's Proxy Statement for the registrant's 2019 Annual Meeting of Stockholders will be filed with the Commission within 120 days after the close of the registrant's 2018 fiscal year and are incorporated by reference in Part III.

XPERI CORPORATION

ANNUAL REPORT ON FORM 10-K

FOR THE YEAR ENDED DECEMBER 31, 2018

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Cautionary Statement Regarding Forward-Looking Statements

This Annual Report contains forward-looking statements, which are subject to the safe harbor provisions created by the Private Securities Litigation Reform Act of 1995. Words such as "expects," "anticipates," "plans," "believes," "seeks," "estimates," "could," "would," "may," "intends," "targets" and similar expressions or variations of such words are intended to identify forward-looking statements, but are not the exclusive means of identifying forward-looking statements in this Annual Report. The identification of certain statements as "forward-looking" is not intended to mean that other statements not specifically identified are not forward-looking. All statements other than statements about historical facts are statements that could be deemed forward-looking statements, including, but not limited to, statements that relate to our future revenue, product development, demand, acceptance and market share, growth rate, competitiveness, gross margins, levels of research, development and other related costs, expenditures, the outcome or effects of and expenses related to litigation and administrative proceedings related to our patents, our intent to enforce our intellectual property, our ability to license our intellectual property, tax expenses, cash flows, our ability to liquidate and recover the carrying value of our investments, our management's plans and objectives for our current and future operations, our plans for quarterly dividends and stock repurchases, the levels of customer spending or research and development activities, general economic conditions, and the sufficiency of financial resources to support future operations and capital expenditures.

Although forward-looking statements in this Annual Report reflect the good faith judgment of our management, such statements can only be based on facts and factors currently known by us. Consequently, forward-looking statements are inherently subject to risks, uncertainties, and changes in condition, significance, value and effect, including those discussed below under the heading "Risk Factors" within Part I, Item 1A of this Annual Report and other documents we file from time to time with the Securities and Exchange Commission (the "SEC"), such as our annual reports on Form 10-K, our quarterly reports on Form 10-Q and our current reports on Form 8-K. Such risks, uncertainties and changes in condition, significance, value and effect could cause our actual results to differ materially from those expressed herein and in ways not readily foreseeable. Readers are urged not to place undue reliance on these forward-looking statements, which speak only as of the date of this Annual Report and are based on information currently and reasonably known to us. We undertake no obligation to revise or update any forward-looking statements in order to reflect any event or circumstance that may arise after the date of this Annual Report. Readers are urged to carefully review and consider the various disclosures made in this Annual Report, which attempt to advise interested parties of the risks and factors that may affect our business, financial condition, results of operations and prospects.

PART I

Item 1. Business

Corporate Information

Our principal executive offices are located at 3025 Orchard Parkway, San Jose, California 95134 USA. Our telephone number is +1 (408) 321-6000. We maintain a corporate website at www.xperi.com. The reference to our website address does not constitute incorporation by reference of the information contained on this website. Xperi, the Xperi logo, Tessera, the Tessera logo, DTS, the DTS logo, FotoNation, the FotoNation logo, Invensas, the Invensas logo, BVA, ZiBond, DBI, DTS-*HD*, DTS Audio Processing, DTS:X Ultra, DTS Virtual:X, DTS Headphone:X, DTS Play-Fi, DTS:X and HD Radio are trademarks or registered trademarks of Xperi Corporation or its affiliated companies in the U.S. and other countries. All other company, brand and product names may be trademarks or registered trademarks of their respective companies.

In this Annual Report, the "Company," "we," "us" and "our" refer to Xperi Corporation ("Xperi"), which operates its business through its subsidiaries. Unless specified otherwise, the financial results in this Annual Report are those of the Company and its subsidiaries on a consolidated basis.

Overview

Xperi is a publicly-traded technology company with headquarters in Silicon Valley and operations around the world. Through its operating subsidiaries, Xperi creates, develops and licenses innovative audio, imaging, semiconductor packaging and interconnect technologies. We have approximately 700 employees and over 25 years of operating experience.

We completed the acquisition of DTS, Inc. ("DTS"), a publicly-traded developer of sound-based technologies, in December 2016. At the time of the acquisition, Tessera Technologies, Inc. and DTS were combined under the newly-formed Tessera Holding Corporation. During the first quarter of 2017, we introduced our new corporate name, Xperi Corporation, launched a new corporate logo, and began trading under a new ticker symbol XPER.

Xperi's portfolio of products and technologies uniquely positions us to deliver innovative audio, imaging and semiconductor solutions for the home, automotive and mobile markets. Our products and technologies also enable entertainment media ecosystem connectivity and new products in emerging markets such as Internet of Things (IoT) and Augmented Reality/Virtual Reality (AR/VR). Our team of more than 400 world-class engineers is focused on creating core technologies that enable intelligent, immersive, and personalized experiences.

We license our innovative products, technologies and inventions to global electronics and media companies which, in turn, integrate these solutions into their own consumer electronics and semiconductor products. Our technologies and inventions are widely adopted and used every day by millions of people. Our audio technologies have shipped in billions of devices for the home, automotive, and mobile markets. Our imaging technologies are embedded in more than 25% of current smartphones. Our semiconductor packaging and interconnect technologies have been licensed to more than 100 customers and have shipped in over 100 billion semiconductor chips.

Xperi operates in two segments. The Product Licensing segment is comprised of our Audio and Imaging businesses, which we license through the DTS, FotoNation, HD Radio, and IMAX Enhanced brands. These licenses typically include the delivery of software and/or hardware-based solutions to our customers or to their suppliers. Product Licensing revenue is derived primarily from sales into the home, automotive and mobile markets.

The Semiconductor and IP Licensing segment includes our Tessera, Invensas and Invensas Bonding Technologies subsidiaries, which license semiconductor packaging and interconnect technologies and associated intellectual property. Semiconductor and IP Licensing revenue is derived from technology and IP licenses to semiconductor companies, foundries and packaging companies. We have a long history of developing and monetizing next-generation technologies, including chip-scale packaging solutions and low-temperature wafer bonding solutions. Today, we are actively developing and licensing 3D semiconductor packaging, interconnect and bonding solutions for semiconductors that are used in every day products such as smartphones, tablets, and laptops as well as servers used in datacenters. We also provide engineering services to our customers to assist them in their evaluation and adoption of our technologies including the transition into high volume production.

Product Licensing Segment

Overview of Solutions

The Product Licensing segment is comprised of solutions from our audio and imaging businesses.

Audio Solutions: Our audio business is a premier audio technology solutions provider for high definition entertainment experiences. The DTS codec is designed to enable recording, delivery and playback of immersive high definition audio and is incorporated by hundreds of customers around the world into an array of consumer electronics devices for use anywhere, at home, in the car, or on the go. We provide products and services to entertainment media ecosystem partners such as motion picture studios, radio and TV broadcasters, game developers and other content creators to facilitate the inclusion of compelling, realistic DTS-encoded audio within their content. This in turn allows consumers to experience immersive and compelling audio wherever they choose to enjoy it. Devices that incorporate DTS audio codec technology include televisions (TVs), personal computers (PCs), smartphones, tablets, automotive entertainment systems, set top boxes (STBs), video game consoles, Blu-ray Disc players, audio/video receivers (AVRs), soundbars, wireless speakers and home theater systems. We also offer DTS post-processing audio solutions designed to enhance the entertainment experience for users of consumer electronics devices, particularly those subject to the physical limitations of smaller speakers, such as TVs, PCs and mobile devices. In addition, our DTS PlayFi technology leverages our audio and technology expertise to enable a variety of high-quality audio playback options across wireless speakers, set top boxes, and mobile devices.

HD Radio is a key part of our automotive audio business as the only digital terrestrial broadcast system approved by the Federal Communications Commission (FCC) for AM/FM radio in the U.S., offering additional channels, crystal-clear sound and advanced data services with no subscription fees. HD Radio enables a high quality in-vehicle radio experience with innovative features and digital capabilities.

Imaging Solutions: FotoNation, a pioneer in computer vision and computational imaging solutions, provides critical imaging technologies that enable millions of consumers to take incredible pictures with their smartphones. These technologies underpin many of the features today's digital users enjoy every day such as advanced portrait modes, face detection and tracking, and automatic effects such as face beautification. Our imaging technologies have become must-have capabilities for mobile device manufacturers and are key to enabling our driver monitoring and driver assist solutions in the car.

Innovative Technology

Within our audio product line, we have a complete range of end-to-end solutions from content creation / mastering, through distribution and playback. We continue to expand our offerings through ongoing research and development, and strategic partnerships with content creators, chip makers, consumer electronics manufacturers, and others within the digital media ecosystem. Our innovative solution offerings are tailored specifically for each market.

Some of the audio technologies we license include:

- DTS:X®, DTS' flagship object-based audio decoder, includes object-based audio decoding, full backward compatibility with all DTS-encoded formats, and Neural:X, the latest spatial remapping technology that translates legacy bitstreams and PCM content to virtually any speaker layout.
- DTS-HD® Master Audio is our advanced surround sound decoder that utilizes variable bit-rate technology to deliver ultimate audio quality while conserving file size and bandwidth, allowing for an uncompromised audio experience.
- HD Radio™ technology enables digital AM/FM broadcast radio, creating significant benefits to all participants in the radio broadcasting ecosystem. In particular, radio listeners enjoy upgraded audio quality, expanded content choices, and new digital services.
- DTS:X Ultra™ is designed for gaming and XR experiences with support for static, multi-channel and object-based audio. Now supported in Windows Spatial Sound PC Gaming platform.
- DTS Headphone:X® includes our integrated surround headphone technology and DTS decoder, coupled with user-driven, headphone-specific tuning and personalization features for an enhanced listening experience over headphones.
- DTS Play-Fi® is a smart audio platform that enables high-quality, synchronized streaming of music directly from a variety of sources to speakers over Wi-Fi. Play-Fi is currently embedded in wireless speakers from many of the industry's leading brands, in leading set top boxes, and for mobile devices that use the Android, Kindle Fire or iOS operating systems, as well as the Windows PC platform.
- IMAX Enhanced program, which Xperi manages and licenses to CE customers worldwide, delivers the ultimate home cinema experience with unique IMAX cinematic content that leverages the DTS:X audio format to flawlessly deliver signature IMAX audio mixes.

The proliferation of connected devices that can support streaming and downloadable content has made our active participation within the digital ecosystem increasingly important, as the availability of DTS-encoded content helps drive consumer demand for electronics that support DTS technologies.

Our immersive audio solutions such as DTS HD and DTS:X empower content creators and are supported by all the major Hollywood studios, many cinema operators in the U.S. and Asia, and leading streaming service providers in the U.S., Europe and Asia. On the radio front, our HD Radio broadcast technology provides compelling advantages to consumers over traditional radio and is accordingly supported by more than 2,300 radio stations, including 98 of the top 100 stations in the top 10 U.S. radio markets.

Our imaging business licenses software solutions and technologies for mobile imaging and other markets. Some of the solutions we license include:

- FotoNation FaceSafe is a 3D face recognition solution for mobile devices. It features a cohesive set of convolutional neural networks (CNN) driven technologies that enable full face detection and tracking, accurate feature detection, face modeling, texture and depth-based recognition, and liveliness detection.
- FotoNation 3D Portrait is the next evolution of the FotoNation portrait enhancement suite. Through AI-based 3D relighting technology coupled with background processing, 3D Portrait enables enhancement of photos and videos created by single and multiple depth sensing cameras. 3D Portrait relighting innovation in video-preview mode showcases how changing the light source position in the frame will affect the outcome in real-time.
- FotoNation Face Analytics is the backbone of several of our computer vision technologies. Face Analytics is able to use factors including exposure, focus, white balance calibration, biometrics, portrait enhancement, and emotion recognition to enable decision-making intelligent cameras. Driven by CNN, our face centric analytics pack contains FDX (FotoNation's next generation face detection technology), Face Features Detection (FFD) and Face Classification (FC).
- FotoNation Body Analytics is the natural extension of face-centric computer vision technologies. Body Analytics offers a new dimension to advanced tracking systems for action cameras and drones. It also plays a key role for body-based imaging techniques such as single camera still and video bokeh, background replacement and portrait enhancement.
- FotoNation Electronic Image Stabilization (EIS) improves the user experience in smartphones when taking photos or recording video. FotoNation's EIS solution delivers lightning-fast image processing with best-in-class motion estimation, filtering and correction. The product eliminates the effect of hand jitter and flight navigation vibration correcting for 6 degrees of freedom, including rotation, translation, lens distortion and rolling shutter effects.
- FotoNation IrisXR is a highly effective iris authentication product. FotoNation provides iris detection and recognition that provide a layer of safety and security as a base with the potential to become a primary driver for augmented and virtual reality experiences.
- FotoNation Driver Monitoring System (DMS) includes face detection and tracking, 3D face features detection, eye gaze tracking, and face and iris recognition. These technologies enable state-of-the-art attentiveness assessment and fatigue detection, as well as in-cabin security and customization options, based on driver identity.
- FotoNation Image Processing Unit (IPU) is our unique collection of IP Cores that enable ultra-low power, low memory size, and low bandwidth consumption when using FotoNation and third-party imaging solutions. IPU is multi-use, feature rich, and programmable. These cores are ideal for enabling intelligence on the edge where power, form factor, privacy, and security are key factors.

Product Delivery

Traditionally, our technologies have resided on integrated circuit (IC) chips. We license a defined and limited set of rights to incorporate our technology into these IC chips, and the IC manufacturers sell these Xperi-enabled chips to our consumer electronics products manufacturer licensees.

We also work closely with the world's leading IC manufacturers to enable support for our technologies on the new programmable architectures that fuel innovation and flexibility in today's consumer electronics products. Our partners specialize in key vertical markets and work closely with us to enable our latest technologies for these programmable parts. Together, we offer these solutions to Xperi consumer electronics products manufacturer licensees.

We have devoted significant time and resources to develop a broad range of solutions with key partners including Amlogic, Analog Devices, Cadence, Cirrus Logic, HiSilicon, Intel, Mediatek, Mstar, NXP, Qualcomm, Realtek, Synaptics, Texas Instruments, and others.

In our automotive business, we engage directly with leading global auto manufacturers as well as their Tier-1 suppliers to get our radio products designed and delivered into the car. We also work with radio broadcasters to support the adoption and implementation of our HD radio technology.

Our imaging business combines proprietary hardware design with software development to offer advantages in both processing speed and lower power, providing distinctive features to smartphones, drones, activity cameras and other battery-powered devices. We license our hardware designs to customers who, in turn, typically embed the hardware as modules within a larger chip. Our software typically runs on a microprocessor with capabilities that are augmented by our hardware within a customer's system.

Customers

We have licensed our audio technologies and related trademarks to substantially all of the major consumer electronics product manufacturers worldwide. These customers include Fujitsu Ten, Harman, Huawei, LG, Microsoft, Panasonic, Samsung and Sony, among others. Our HD Radio technology is incorporated into a number of our automotive partners' products, including vehicles from Acura, Audi, BMW, Ford, GM, Honda, Hyundai, Tesla, and Toyota, among many others.

Our imaging technologies and products have been licensed to mobile phone and digital camera manufacturers worldwide, including to Huawei, LG, Nikon, Oppo, Socionext, ZTE and others.

Research & Development

As demonstrated by our portfolio of industry-recognized, widely-deployed advanced technologies, we have a long track record of innovating in the fields of audio and imaging. Our audio business was founded more than 25 years ago on the basis of developing a unique audio solution for cinemas. Today, through a collection of world-class talent and strong research and development capabilities, we continue to focus on providing unique, cost effective and differentiated audio solutions for an ever larger universe of addressable markets.

Our imaging business was founded over 20 years ago as well, with the idea of connecting digital imaging devices to other computing platforms and enhancing the imaging experience for consumers. Starting with imaging research and advanced algorithm development, FotoNation pioneered a hybrid hardware-software delivery mechanism that has enabled the industry's foremost low-power, high performance imaging capabilities on hand-held and edge devices. We have ongoing investment in world-class R&D supported by strong relationships with key OEMs and platform providers in consumer electronics.

Research and development and other related costs in our Product Licensing segment were approximately $78.9 million, $75.8 million and $16.1 million for the years ended December 31, 2018, 2017 and 2016, respectively. These costs include DTS research and development costs since the acquisition date of December 1, 2016.

Intellectual Property Portfolio

As of December 31, 2018, our subsidiaries comprising the Product Licensing segment owned approximately 914 United States patents and patent applications, as well as approximately 1,471 foreign patents and patent applications. The last of the issued patents to expire is in 2037.

Strategy

Our product licensing business is focused on three markets: home, automotive and mobile devices.

Home Market Strategy

The Home market consists of TVs, Blu-ray stand-alone players, Audio/Video Receivers, sound bars, wireless speakers, game consoles, set-top-boxes, and smart home cameras and sensors.

Our business strategy in the home market is focused on the following key drivers:

- Driving the proliferation of DTS-encoded content among Hollywood studios and digital distribution partners,
- Investing in and broadening the OEM and IC footprints that support DTS technologies,
- Expanding the DTS:X and IMAX Enhanced programs from AVRs and sound bars to source devices - TVs and OTT/STB (Over-The-Top Streaming/Set-Top-Box), and
- Developing and bringing to market a strong pipeline of innovative technology solutions including AI applications related to voice and image sensors.

Automotive Market Strategy

In the Automotive market we primarily serve automotive OEMs and tier one automotive suppliers who deliver in-dash head units containing HD Radio technology, as well as DVD players with DTS decoding and audio post-processing solutions, such as DTS Neural:XTM. In late 2018, we announced DTS® Connected Radio™ technology was being integrated into the cars of a major global automotive brand and was planned for commercial launch for the 2020 model year. DTS Connected Radio will be the first global system to enable car makers to create a common, enhanced radio experience across different analog and digital broadcast systems deployed regionally. Utilizing an IP connection installed in a vehicle, DTS Connected Radio delivers an innovative analog AM/FM and digital (DAB and HD Radio) experience by pairing broadcast programming with IP-delivered content. DTS Connected Radio aggregates metadata, such as on-air radio program and talent information, artist and song information, station contact information and more, directly from broadcasters around the world to deliver an enhanced in-vehicle radio experience.

Our business strategy in the Automotive market is focused on the following key drivers:

- Proliferating digital radio and auxiliary data services such as traffic, local weather and enhanced content,
- Globalizing advanced digital radio solutions, including DTS Connected Radio, and
- Developing and bringing to market integrated innovative safety solutions, such as ADAS (Advanced Driver Assistance Systems) and DMS (Driver Monitoring Systems) based on our industry-leading knowledge of computer vision and automotive connectivity technologies.

Mobile Market Strategy

The Mobile market consists of smartphones, tablets, PCs and gaming headsets, as well as emerging opportunities such as Augmented Reality, Virtual Reality and Mixed Reality (AR/VR/MR).

Our business strategy in the Mobile market is focused on the following key drivers:

- Leveraging our long-time industry leadership in computer vision technology focused on human subjects to develop integrated solutions for 2D & 3D image capture and enhancement,
- Developing and delivering integrated imaging solutions for biometrics and user authentication,
- Further enhancing our imaging solutions with the application of artificial intelligence-based machine learning to our industry-leading database of 20 million real life images, and
- Delivering premium content and DTS-branded entertainment experiences for applications such as movies, gaming, AR/VR/MR.

Competition

Our product licensing business faces competition from other third-party providers of similar solutions as well as internal engineering and design groups among industry IC provider and consumer electronic manufacturers.

In the audio market, our primary competitor is Dolby Laboratories, which develops and markets, among other things, high-definition audio products and services. Dolby's long-standing market position, brand, business relationships, resources and inclusion in various industry standards provide it with a strong competitive position.

In addition to Dolby, we compete in specific product markets with companies such as Fraunhofer IIS and various other consumer electronics product manufacturers. Many of these competitors have a wide variety of strengths that afford them competitive advantages, such as longer operating histories, greater resources, greater name recognition, or the ability to offer their technologies for a lower price or for free. We have historically competed effectively against these competitors due in part to our ability to position our brand as a premium offering that contains superior proprietary technology, the quality of our customer service, our inclusion in industry standards and our industry relationships.

Our HD Radio and DTS Connected Radio solutions face competition from subscription-based digital service providers such as Sirius/XM, Pandora, Gracenote, and other digital audio and data service providers.

Our image processing technologies broadly compete with other image processing software vendors such as ArcSoft, Inc., as well as engineering and design groups of mobile phone and digital camera manufacturers that seek to provide similar technologies by employing different approaches. Over time, we expect to see new competitors and other competing technologies emerge.

Semiconductor and IP Licensing Segment

The Semiconductor and IP Licensing Segment licenses semiconductor packaging and interconnect technologies and related IP. These technology and IP assets are licensed primarily through our subsidiaries, Tessera, Invensas and Invensas Bonding Technologies. Tessera's research and development led to significant innovations in semiconductor packaging technology. We patented these innovations, often referred to as chip-scale packaging, which have been widely adopted in the electronics industry. The wave of adoption was initially led by Intel Corporation, and over time, many semiconductor companies and outsourced assembly and test (OSAT) companies entered into technology and patent license agreements with Tessera, Inc.

Invensas Corporation develops next generation semiconductor packaging and interconnect technologies for memory, mobile, computing and automotive applications. For these applications, Invensas innovates in three primary areas: (i) DRAM and NAND , (ii) imaging and RF, and (iii) three-dimensional integrated circuit (3D-IC) assemblies. Invensas engineering teams develop and prototype these technologies in advanced assembly and test laboratories, as well as perform product reliability and acceptance testing. Invensas builds collaborative partnerships with world-class manufacturing companies and high-volume equipment and materials suppliers and licenses its technology solutions to original equipment manufacturers (OEMs), original design manufacturers (ODMs), integrated device manufacturers (IDMs), fabless device suppliers, foundries, and outsourced assembly and test (OSATs) providers. Invensas also supports the transfer of its technology at customer-designated sites.

Within each of these three areas of innovation (memory, mobile, and 3D-IC), Invensas has created specific product solutions that address critical needs in the market. For example, Invensas innovates in the 3D-IC space. 3D-IC, which typically includes Through-Silicon Vias (TSVs), is widely expected to be the next major inflection in the semiconductor industry and is applicable to multiple markets, including mobile, computing, data storage, and networking. In August of 2015, we augmented our 3D-IC portfolio with the acquisition of Ziptronix, Inc. (now known as Invensas Bonding Technologies, Inc.), a leading developer of low temperature wafer bonding technologies, which are targeted at the image sensor, DRAM, NAND, RF, MEMS, and 2.5D and 3D-IC markets. Our ZiBond® technology is a low temperature homogenous (e.g. oxide-to-oxide) direct bonding solution that forms strong bonds between wafers or die with the same or different coefficients of thermal expansion (CTE). ZiBond offers multiple benefits over conventional bonding techniques such as adhesives, anodic bonding, eutectic bonding and glass frit. Bonding is performed at room temperature, which enhances overall yield and reliability by eliminating the negative effects associated with CTE mismatch, warpage and distortion. Higher throughput and lower cost-of-ownership are realized by using industry-standard manufacturing equipment, such as wafer aligners and bonders. Our DBI® technology is a low temperature hybrid direct bonding solution that allows wafers or die to be bonded with exceptionally fine pitch 3D electrical interconnect. Like ZiBond, the DBI alignment and bonding process is performed at room temperature. DBI also leverages industry-standard manufacturing equipment, such as wafer and die bonders, enabling high-throughput, low cost-of-ownership fabrication processes required for high volume market applications. DBI can minimize the need for TSVs by allowing interconnection to occur at the bonding surface, thereby improving electrical performance and reducing cost. By incorporating dielectric bonding, DBI eliminates the need for under-fill while providing excellent thermal performance, reliability and hermeticity.

Customers

Our semiconductor packaging, interconnect and other related technologies have been licensed to more than 100 companies. These customers include Samsung, SK hynix, Micron, OmniVision and Broadcom, among others.

Research & Development

As demonstrated by our industry-recognized and widely-deployed advanced technologies, we have a long history of developing, licensing and delivering innovative semiconductor packaging and interconnect solutions worldwide. Many of our longstanding innovations have enabled core function and performance gains in a wide range of semiconductor devices and electronics products over the years.

As we have grown, we continue to develop new technologies internally as well as seek to acquire best-in-class technologies from outside sources. Our combination of experienced research and development engineers, our base of technology, and our constant efforts to innovate new industry-leading solutions, provides a strong foundation for the development and commercialization of new and unique semiconductor packaging and interconnect solutions going forward.

Research and development and other related costs for the Semiconductor and Intellectual Property segment were approximately $27.5 million, $30.0 million and $28.6 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Intellectual Property Portfolio

As of December 31, 2018, our subsidiaries comprising the Semiconductor and IP Licensing segment owned approximately 1,852 United States patents and patent applications, as well as approximately 1,287 foreign patents and patent applications. The last of the issued patents to expire is in 2037.

From time to time, we acquire complementary IP portfolios from other leading companies in the semiconductor industry. Our criteria for patent acquisitions include: the fit with our existing portfolios, the number and jurisdiction of patent assets, the technical and legal strength of the patents, the actual or likely adoption by industry, and the economic value of the inventions. See Part I, Item 1A- *Risk Factors*.

Strategy

We are focused on the development of advanced semiconductor packaging and interconnect technologies to enable the next generation of mobile, consumer, and computing products. Leveraging our extensive design, simulation and prototyping capability, we partner with leaders across the semiconductor ecosystem to develop and commercialize our technologies. As an integral component of our commercialization effort, we transfer our technologies to customer-selected manufacturing sites, foundries and OSATs to enable our customers to manufacture semiconductor products in high volume.

Although we are engaged with and have successfully licensed and transferred our technologies to many semiconductor companies, some of the companies that use our patented technologies have nonetheless chosen not to enter into license agreements with us. Consequently, we have initiated litigation to enforce our IP rights. We view litigation as an instrument of last resort and we use it only when our efforts to reach negotiated licenses have stalled or failed. If we are unable to secure license agreements on favorable terms through negotiations, or if licensees do not comply with the terms of their licenses, we might have to file new litigation to enforce our rights. See Part 1, Item 3-*Legal Proceedings.*

Competition

We compete primarily with internal technology development groups at semiconductor manufacturers, foundries, assemblers, and electronic component and system manufacturers, who may create their own solutions that compete with technologies that we license. In general, there may be several ways to solve a particular technical problem and there can be no assurance that our inventions and approaches will be the ones generally adopted by the industry. We also compete with other firms in acquiring patent portfolios. The most significant impediments to our semiconductor and IP licensing business are (1) the time it takes for new technologies to be adopted in high volume production, and (2) the tendency for companies to use our inventions and intellectual property without first obtaining a license from us.

Customer Concentration

Nearly all of our revenue is denominated in U.S. dollars. The following table sets forth revenue generated from customers comprising 10% or more of total revenue for the periods indicated:

	Years Ended December 31,		
	2018	2017	2016
Samsung Electronics, Co. Ltd.	38%	*	25%
SK hynix Inc.	12%	*	12%
Micron Technology, Inc.	*	11%	17%
Amkor Technologies, Inc.	*	10%	15%

* denotes less than 10% of total revenue.

We adopted the new accounting standard, Accounting Standards Update ("ASU") No. 2014-09 (Topic 606) "Revenue from Contracts with Customers" effective January 1, 2018, which had a material impact on the financial reporting of our operating results as described below. We followed the modified retrospective transition method upon adoption, and under this method the comparative information for prior fiscal years has not been restated and continues to be reported under the accounting standards in effect for those periods. Refer to "Note 3 - *Recent Accounting Pronouncements*" and "Note 4 – *Revenue*" in the Notes to Consolidated Financial Statements for detailed information.

A significant portion of our revenue is derived from customers headquartered outside of the U.S., principally in Asia, and we expect this revenue will continue to account for a significant portion of total revenue in future periods. The table below lists the geographic regions of the headquarters of our customers (in thousands) and the percentage of revenue derived from each region for the periods indicated:

	Years Ended December 31,					
	2018		2017		2016	
Korea	$ 209,245	51%	$ 50,155	13%	$ 95,170	37%
Japan	88,513	22	81,688	22	6,866	3
U.S.	53,245	13	164,846	44	99,594	38
Europe and Middle East	31,864	8	13,632	4	1,321	1
Taiwan	2,360	1	33,861	9	34,763	13
Other	20,906	5	29,550	8	21,851	8
	$ 406,133	100%	$ 373,732	100%	$ 259,565	100%

See "Note 16 - *Segment and Geographic Information*" in the Notes to Consolidated Financial Statements for additional geographic information about our revenue and long-lived assets.

The international nature of our business exposes us to a number of risks, including, but not limited to:

- laws and business practices favoring local companies;
- increased tax rates and withholding tax obligations on license revenue in non-U.S. jurisdictions that we may not be able to offset fully against our U.S. tax obligations;
- difficulties in enforcing U.S. judgments and orders against foreign persons and products made overseas; and
- less effective protection of intellectual property than is afforded in the U.S. or other developed countries.

Available Information

Our Internet address is www.xperi.com where we make available, free of charge, our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Our SEC reports can be accessed through the investor relations section of our website. The information found on our website is not incorporated into this or any other report we file with or furnish to the SEC.

Item 1A. Risk Factors

Our operations and financial results are subject to various risks and uncertainties, including those described below, that could adversely affect our business, financial condition, results of operations, cash flows, and the trading price of our common stock.

Our revenue and billings have been concentrated and we anticipate that our revenue and billings will continue to be concentrated in a limited number of customers. If we lose any of these customers, or these customers do not pay us, our revenue and billings could decrease substantially.

We have earned a significant amount of our revenue from a limited number of customers. For the year ended December 31, 2018, there were two customers that accounted for 10% or more of total revenue. We expect that a significant portion of our billings and revenue will continue to come from a limited number of customers for the foreseeable future. If we lose any of these customers, or these customers do not pay us, our billings and revenue could decrease substantially. In addition, a significant portion of our recurring billings is the result of structured payment terms in connection with the settlement of litigation matters, including our settlements with Amkor Technology, Inc. and Powertech Technology Inc. which we received our last payments from in the fourth quarter of 2018. If we are unable to replace the billings from an expiring license or at the end of structured payment terms of a settlement agreement with similar billings from other customers, our royalties could be adversely impacted as compared to periods prior to such expiration or the end of such payment terms.

From time to time we enter into license agreements that have fixed expiration dates and if, upon expiration or termination, we are unable to renew or replace such license agreements on terms favorable to us, our results of operations could be harmed.

From time to time we enter into license agreements that have fixed expiration dates. Upon expiration of such agreements we need to renew or replace these agreements in order to maintain our royalty base. If we are unable to replace the royalties from an expiring license, either through a renewal or with similar royalties from other customers, our results of operations could be adversely impacted as compared to periods prior to such expiration.

Furthermore, we may not be able to continue licensing customers on terms favorable to us, under the existing terms or at all, which would harm our results of operations. While we have expanded our licensable technology portfolio through internal development and patents purchased from third parties, there is no guarantee that these measures will lead to continued royalties. If we fail to continue to do business with our current licensees, our business would be materially adversely affected.

The success of our patent licensing business is dependent on the quality of our patent assets and our ability to create and implement new technologies or expand our licensable technology through acquisitions.

We derive a significant portion of our billings from patent licenses and royalties, including structured settlement payments. The success of our patent licensing business depends on our ability to continue to develop and acquire high quality patents. We devote significant resources to developing new technologies and to sourcing and acquiring patents to address the evolving needs of the semiconductor and the consumer and communication electronics industries, and we must continue to do so in the future to remain competitive. Developments in our technologies are inherently complex and require long development cycles and a substantial investment before we can determine their commercial viability. Moreover, competition for acquiring high quality patents is intense and there is no assurance that we can continue to acquire such patents on favorable terms. We may not be able to develop and market new or improved technologies, or to develop or acquire high quality patents, in a timely or commercially acceptable fashion. Furthermore, our acquired and developed patents will expire in the future. Our current U.S. issued patents expire at various times through 2037. We need to develop or acquire successful innovations and obtain royalty-generating patents on those innovations before our current patents expire, and our failure to do so would significantly harm our business, financial position, results of operations and cash flows.

Our use of cash and substantial long-term borrowing to finance the DTS acquisition could limit future opportunities for our business, and could materially adversely affect our financial condition if we are unable to pay principal or interest on, or to refinance, such indebtedness.

The DTS acquisition was financed with existing cash balances and a $600 million secured term loan. The combination of reduced cash balances and the incurrence of substantial long-term debt could limit our ability to make future acquisitions, investments and capital expenditures that may be necessary or desirable for the operation or expansion of our business. Moreover, our ability to service the principal and interest payments on such indebtedness will depend on our continuing ability to generate requisite cash flow from our existing and acquired business operations. The terms of the indebtedness include covenants that may limit our operating flexibility and create a risk of default if we are unable to meet financial ratios and other covenant requirements. While we made a voluntary prepayment of $100 million of principal on the indebtedness in January 2018 in connection with the refinancing of the debt, we may be unable to generate sufficient cash flow to make principal and interest payments in future periods, and in any event we may be required to refinance the remaining indebtedness upon its maturity in 2023. We may be unable to refinance such indebtedness on favorable terms or at all. For example, a downgrade in our credit rating could make any such refinancing more difficult to secure on favorable terms. A default under, or inability to refinance, our indebtedness could substantially adversely affect our continuing financial viability, and could lead to insolvency, bankruptcy, and the reduction or elimination of stockholders' equity.

Our variable rate indebtedness may expose us to interest rate risk, which could cause our debt costs to increase significantly.

As of December 31, 2018, we had $494.0 million of outstanding indebtedness that was subject to floating interest rates. Changes in economic conditions outside of our control could result in higher interest rates, thereby increasing our interest expense and reducing the funds available for capital investment, operations or other purposes. At December 31, 2018, a 1% increase in the effective interest rate on our outstanding debt throughout a one-year period would result in an annual increase in our interest expense of approximately $5.0 million. Any significant increase in our interest expense could negatively impact our results of operations and cash flows and also our ability to pay dividends in the future. If the U.S. Federal Reserve raises its benchmark interest rate during 2019, any increases would likely impact the borrowing rate on our outstanding indebtedness, and increase our interest expense, comparably.

We are currently involved in litigation and administrative proceedings involving some of our patents and may be involved in other such actions in the future; any adverse decisions, findings of non-infringement, or invalidation or limitation of the scope of our patents could significantly harm our business.

We are currently involved in litigation involving some of our patents, and may be involved in other such actions in the future. The parties in these legal actions often challenge the infringement, validity, scope, enforceability and/or ownership of our patents. In addition, in the past requests for reexamination or review have been filed in the U.S. Patent and Trademark Office ("PTO") with respect to patent claims at issue in one or more of our litigation proceedings, and oppositions have been filed against us with respect to our patents in the European Patent Office ("EPO"). During a reexamination or review proceeding and upon completion of the proceeding, the PTO or EPO may leave a patent in its present form, narrow the scope of the patent, or cancel or find unpatentable some or all of the claims of the patent. For example, the PTO has issued several Official Actions rejecting or maintaining earlier rejections of many of the claims in some of our patents. From time to time we assert these patents and patent claims in litigation and administrative proceedings. If the PTO's adverse rulings are upheld on appeal and some or all of the claims of the patents that are subject to reexamination are canceled, our business may be significantly harmed. In addition, counterparties to our litigation and administrative proceedings may seek and obtain orders to stay these proceedings based on rejections of claims in PTO reexaminations or review proceedings, and other courts or tribunals reviewing our legal actions could make findings adverse to our interests, even if the PTO actions are not final.

We cannot predict the outcome of any of these proceedings or the myriad procedural and substantive motions in these proceedings. If there is an adverse ruling in any legal or administrative proceeding relating to the infringement, validity, enforceability or ownership of any of our patents, or if a court or an administrative body such as the PTO limits the scope of the claims of any of our patents or concludes that they are unpatentable, we could be prevented from enforcing or earning future royalties from those patents, and the likelihood that customers will take new licenses and that current licensees will continue to agree to pay under their existing licenses could be significantly reduced. The resulting reduction in license fees and royalties could significantly harm our business, consolidated financial position, results of operations and cash flows, as well as the trading price of our common stock.

Regardless of the merits of any claim, the continued maintenance of these legal and administrative proceedings may result in substantial legal expenses and diverts our management's time and attention away from our other business operations, which could significantly harm our business. Our enforcement proceedings have historically been protracted and complex. The time to resolution and complexity of our litigation, its disproportionate importance to our business compared to other companies, the propensity for delay in civil litigation, and the potential that we may lose particular motions as well as the overall litigation could all cause significant volatility in our stock price and have a material adverse effect on our business and consolidated financial position, results of operations, and cash flows.

The timing of billings under our license and settlement agreements may cause fluctuations in our quarterly or annual financial results.

From time to time we enter into license and settlement agreements that include pricing or payment terms that result in quarter-to-quarter or year-over-year fluctuations in our billings and cash flows. The effect of these terms may also cause our aggregate annual billings to grow less rapidly than annual growth in overall unit shipments in the applicable end market. Additionally, our customers may fail to pay, delay payment of or underpay what they owe to us under our license and settlement agreements, which may in turn require us to enforce our contractual rights through litigation, resulting in payment amounts and timing different than expected based on the terms of our license and settlement agreements. This also may cause our revenue, billings and cash flows to fluctuate on a quarter-to-quarter or year-over-year basis.

We expect to continue to be involved in material legal proceedings to enforce or protect our intellectual property and contract rights, including material litigation with existing licensees or strategic partners, that could harm our business.

From time to time, our efforts to obtain a reasonable royalty through our sales efforts do not result in the prospective customer agreeing to license our patents or our technology. In certain cases, we become involved in litigation to enforce our intellectual property rights, enforce the terms of our license agreements, determine the validity and scope of the proprietary rights of others, and defend against claims of infringement or invalidity. For example, on September 28, 2017, we filed legal proceedings against Samsung Electronics and certain of its affiliates, alleging infringement of certain of our patents, and settled these matters in December 2018. Our current legal actions, as described in Part II, Item 1 - *Legal Proceedings*, are examples of disputes and litigation that impact our business. If we are not able to reach agreement with customers or potential customers we may be involved in similar legal proceedings in the future, including proceedings to ensure proper and full payment of royalties by licensees under the terms of their license agreements.

Existing and any future legal actions may harm our business. For example, legal actions could cause an existing customer or strategic partner to cease making royalty or other payments to us, or to challenge the validity and enforceability of our patents or the scope of our license agreements, and could significantly damage our relationship with such customer or strategic partner and, as a result, prevent the adoption of our technologies and intellectual property by such customer or strategic partner. Litigation could also severely disrupt or shut down the business operations of our customers or strategic partners, which in turn would significantly harm our ongoing relations with them and cause us to lose royalties. Moreover, the timing and results of any of our legal proceedings are not predictable and may vary in any individual proceeding. Further, our product licensing business could be subject to greater risk of claims of infringement of third-party intellectual property rights as a result of our IP licensing business. The risks of third-party infringement claims could be heightened by our need to engage in enforcement activities with respect to our existing patents, as our existing or potential licensees may seek to assert infringement claims against our DTS or other product businesses in response to our enforcement activities relating to our existing patents. For example Broadcom had filed patent litigation against our Play-Fi business which we believe was in response to our patent litigation filed against them. Competitors of our product licensing business would not be subject to such heightened risk of third-party claims, and such claims could adversely affect our product licensing business as well as impair our enforcement ability and licensing royalties.

The cost of litigation is typically very high and can be difficult to predict, and such high costs and unpredictability may negatively impact our financial results.

From time to time we identify products that we believe infringe our patents. We seek to license the companies that design, make, use, import, sell, or offer for sale those products, but sometimes those companies are unwilling to enter into a license agreement. In those circumstances, we may elect to enforce our patent rights against those companies and products. Litigation stemming from these or other disputes could harm our relationships with those companies or other licensees, or our ability to gain new customers, who may postpone licensing decisions pending the outcome of the litigation or dispute, or who may, as a result of such litigation, choose not to adopt our technologies. In addition, these legal proceedings could be very expensive and may significantly reduce our profits.

In addition, from time to time our customers with existing license agreements dispute their obligations under such agreements, or we may dispute their reporting of royalties due under such agreements. In the past, customers have threatened to initiate litigation against us regarding our licensing royalty rate practices including our adherence to licensing on fair, reasonable, and non-discriminatory terms and potential antitrust claims.

The costs associated with legal proceedings are typically high, relatively unpredictable, and not completely within our control. These costs may be materially higher than expected, which could adversely affect our operating results and lead to volatility in the price of our common stock. Whether or not determined in our favor or ultimately settled, litigation diverts our managerial, technical, legal and financial resources from our business operations. Furthermore, an adverse decision in any of these legal actions could result in a loss of our proprietary rights, subject us to significant liabilities, require us to seek licenses from others, limit the value of our licensed technology or otherwise negatively impact our stock price or our business and consolidated financial position, results of operations and cash flows.

Even if we prevail in our legal actions, significant contingencies may exist to their settlement and final resolution, including the scope of the liability of each party, our ability to enforce judgments against the parties, the ability and willingness of the parties to make any payments owed or agreed upon, and the dismissal of the legal action by the relevant court, none of which are completely within our control. Parties that may be obligated to pay us royalties or damages, or that may otherwise be subject to a judgment, could become insolvent or decide to alter their business activities or corporate structure, which could affect our ability to collect royalties or damages from, or enforce a judgment against, such parties.

Recent and proposed changes to U.S. patent laws, rules, and regulations may adversely impact our business.

Our business relies in part on the uniform and historically consistent application of U.S. patent laws, rules, and regulations. There have been numerous recent administrative, legislative, and judicial changes and proposed changes to patent laws and rules that may have a significant impact on our ability to protect our technology and enforce our intellectual property rights. For example, there have been and may be bills introduced in the U.S. Congress relating to patent law that could adversely impact our business depending on the scope of any bills that may ultimately be enacted into law. As another example, the U.S. Supreme Court and lower courts have in recent years issued decisions that are not favorable to patent owners. Some of these changes or potential changes may not be advantageous for us and may make it more difficult to obtain adequate patent protection, or to enforce our patents against parties using them without a license or payment of royalties. These changes or potential changes could increase the costs and uncertainties surrounding the prosecution of our patent applications and the enforcement of our patent rights and could have a negative effect on our ability to license our patents and, therefore, on the royalties we can collect.

Some of our license agreements may convert to fully paid-up licenses at the expiration of their terms, or upon certain milestones, and we may not receive royalties after that time.

From time to time we enter into license agreements that automatically convert to fully paid-up licenses upon expiration or upon reaching certain milestones. We may not receive further royalties from customers for any licensed technology under those agreements if they convert to fully paid-up licenses because such customers will be entitled to continue using some, if not all, of the relevant intellectual property or technology under the terms of the license agreements without further payment, even if relevant patents or technologies are still in effect. If we cannot find another source of royalties to replace the royalties from these license agreements converting to fully paid-up licenses, our results of operations following such conversion would be materially adversely affected.

A significant amount of our royalty revenue and billings comes from a few end markets and products, and our business could be harmed if demand for these market segments or products declines.

A significant portion of our royalties comes from the manufacture and sale of packaged semiconductor chips for DRAM, application-specific standard product semiconductors, application-specific integrated circuits, and memory. In addition, we derive substantial royalties from the incorporation of our technology into mobile devices, consumer products and computer hardware. If demand for semiconductors in any one or a combination of these market segments or products declines, our royalties may be reduced significantly and our business would be harmed.

The long-term success of our business is dependent on a royalty-based business model, which is inherently risky.

The long-term success of our business is dependent on future royalties paid to us by customers. Royalty payments under our licenses may be based, among other things, upon the number of electrical connections to the semiconductor chip in a package covered by our licensed technology, a percent of net sales, a rate per package, a per unit sold basis or a fixed quarterly amount. We are dependent upon our ability to structure, negotiate and enforce agreements for the determination and payment of royalties, as well as upon our customers' compliance with their agreements. We face risks inherent in a royalty-based business model, many of which are outside of our control, such as the following:

- the rate of adoption and incorporation of our technology by semiconductor manufacturers, assemblers, foundries, manufacturers of consumer and communication electronics, and the automotive and surveillance industry;

- the willingness and ability of materials and equipment suppliers to produce materials and equipment that support our licensed technology, in a quantity sufficient to enable volume manufacturing;
- the ability of our customers to purchase such materials and equipment on a cost-effective and timely basis;
- the length of the design cycle and the ability of us and our customers to successfully integrate certain of our imaging technologies into their integrated circuits;
- the demand for products incorporating semiconductors that use our licensed technology;
- the cyclicality of supply and demand for products using our licensed technology;
- the impact of economic downturns; and
- the impact of poor financial performance of our customers.

It is difficult for us to verify royalty amounts owed to us under our licensing agreements, and this may cause us to lose revenue and billings.

The terms of our license agreements often require our customers to document their use of our technology and report related data to us on a quarterly basis. Although our license terms generally give us the right to audit books and records of our customers to verify this information, audits can be expensive, time consuming, and may not be cost justified based on our understanding of our customers' businesses, especially given the international nature of our customers. Our license compliance program audits certain customers to review the accuracy of the information contained in their royalty reports in an effort to decrease the likelihood that we will not receive the royalty to which we are entitled under the terms of our license agreements, but we cannot give assurances that such audits will be effective to that end.

The markets for semiconductors and related products are highly concentrated, and we may have limited opportunities to license our technologies or sell our products.

The semiconductor industry is highly concentrated in that a small number of semiconductor designers, foundries, and manufacturers account for a substantial portion of the purchases of semiconductor products generally, including our products and products incorporating our technologies. Continued consolidation in the semiconductor industry may increase this concentration. Accordingly, we expect that licenses of our technologies and sales of our products will be concentrated with a limited number of customers for the foreseeable future. As we develop and acquire new technologies and integrate them into our product line, we will need to establish new relationships to sell these products. Our financial results significantly depend on our success in establishing and maintaining relationships with, and effecting substantial sales to, these customers. Even if we are successful in establishing and maintaining such relationships, our financial results will be dependent in large part on these customers' sales and business results.

We make significant investments in new products and services that may not achieve technological feasibility or profitability or that may limit our growth.

We have made and will continue to make significant investments in research, development, and marketing of new technologies, products and services, including audio, imaging, and advanced semiconductor packaging, bonding, and interconnect technologies. Investments in new technologies are speculative and technological feasibility may not be achieved. Commercial success depends on many factors including demand for innovative technology, availability of materials and equipment, selling price the market is willing to bear, competition and effective licensing or product sales. We may not achieve significant revenue or billings from new product and service investments for a number of years, if at all. Moreover, new technologies, products and services may not be profitable, and even if they are profitable, operating margins for new products and businesses may not be as high as the margins we have experienced historically or originally anticipated.

We may not be able to evolve our audio and imaging technologies, products, and services, or develop new technologies, products, and services, that are acceptable to our customers or the evolving markets, and our customers may use technologies offered at lower cost by others.

The markets for our audio and imaging technologies, products, and services are characterized by:

- rapid technological change and product obsolescence;
- new and improved product introductions;
- changing consumer demands;
- increasingly competitive product landscape; and
- evolving industry standards.

Our future success in our product licensing business depends upon our ability to enhance our existing technologies, products, and services and to develop enhanced and acceptable new technologies, products, and services on a timely basis. The development of enhanced and new audio and imaging technologies, products, and services is a complex and uncertain process requiring high levels of innovation, highly-skilled engineering and development personnel, and the accurate anticipation of technological and market trends. We may not be able to accurately identify, develop, market, or support new or enhanced technologies, products, or services on a timely basis, if at all. Furthermore, our new imaging and audio technologies, products, and services may never gain market acceptance, and we may not be able to respond effectively to evolving consumer demands, technological changes, product announcements by competitors, or emerging industry standards. Any failure to respond to these changes or concerns would likely prevent our imaging and audio technologies, products, and services from gaining market acceptance or maintaining market share and could lead to our imaging and audio technologies, products, and services becoming obsolete.

Furthermore, the decision by a party dominant in the entertainment value chain to provide audio or imaging technology at very low or no cost could cause our customers and other manufacturers not to utilize our technologies or services in the future. Our customers may choose to use technologies that their own in-house audio or imaging engineering teams have developed, or in which they have an interest. Accordingly, our revenue or billings could decline if our customers choose not to incorporate our audio or imaging technologies in their products, or if they sell fewer products incorporating our audio or imaging technologies.

Competing technologies may harm our business.

We expect that our technologies will continue to compete with technologies of internal design groups at semiconductor manufacturers, assemblers, electronic component, foundries and system manufacturers. The internal design groups of these companies create their own semiconductor, packaging, audio and imaging solutions. If these internal design groups design around our patents or introduce unique solutions superior to our technology, they may not need to license our technology. These groups may design technology that is less expensive to implement or that enables products with higher performance or additional features. Many of these groups have substantially greater resources, greater financial strength and lower cost structures which may allow them to undercut our price. They also have the inherent advantage of access to internal corporate strategies, technology roadmaps and technical information. As a result, they may be able to bring alternative solutions to market more easily and quickly.

DTS audio technologies compete with other providers of audio products and services, with Dolby Laboratories as the primary competitor in high-definition audio processing. Dolby Laboratories enjoys certain competitive advantages in selling its digital multi-channel audio technology, having introduced such technology before we did, and having achieved mandatory standard status in product categories that we have not, including terrestrial digital TV broadcasts in the United States.

For our embedded image processing technologies such as Face Detection and our other products, our offerings compete with other image processing software vendors such as ArcSoft, Inc. as well as internal design groups of mobile phone and digital camera manufacturers providing similar technologies by employing different approaches.

In the future, our licensed technologies may also compete with other technologies that emerge. These technologies may be less expensive and provide higher or additional performance. Companies with these competing technologies may also have greater resources. Technological change could render our technologies obsolete, and new, competitive technologies could emerge that achieve broad adoption and adversely affect the use of our technologies and intellectual property.

If we do not successfully further develop and commercialize the technologies we acquire, or cultivate strategic relationships that expand our licensable portfolio, our competitive position could be harmed and our operating results adversely affected.

We attempt to expand our licensable technology portfolio and technical expertise by further developing and acquiring new technologies or developing strategic relationships with others. These strategic relationships may include the right for us to sublicense technology and intellectual property to others. However, we may not be able to acquire or obtain rights to licensable technology and intellectual property in a timely manner or upon commercially reasonable terms. Even if we do acquire such rights, some of the technologies we invest in may be commercially unproven and may not be adopted or accepted by the industry. Moreover, our research and development efforts, and acquisitions and strategic relationships, may be futile if we do not accurately predict the future needs of the semiconductor, consumer and communication electronics, and consumer imaging and audio processing industries. Our failure to acquire new technologies that are commercially viable in the semiconductor, consumer and communication electronics, and consumer imaging and audio processing industries could significantly harm our business, financial position, results of operations and cash flows.

The way we integrate internally developed and acquired technologies into our products and licensing programs may not be accepted by customers.

We have devoted, and expect to continue to devote, considerable time and resources to developing, acquiring and integrating new and existing technologies into our products and licensing programs. However, if customers do not accept the way we have integrated our technologies, they may adopt competing solutions. In addition, as we introduce new products or licensing programs, we cannot predict with certainty if and when our customers will transition to those new products or licensing programs. Moreover, with respect to certain of our imaging technologies, even after we have signed a license agreement with a customer, we will often not see significant royalties from that customer until after such technologies have been successfully designed into the customer's integrated circuits, which can take 18 months or longer. If customers fail to accept new or upgraded products or licensing programs incorporating our technologies, our financial position, results of operations and cash flows could be adversely impacted.

If we fail to protect and enforce our intellectual property rights, contract rights, and our confidential information, our business will suffer.

We rely primarily on a combination of license, development and nondisclosure agreements and other contractual provisions, as well as patent, trademark, trade secret and copyright laws, to protect our technology and intellectual property. If we fail to protect our technology, intellectual property, or contract rights, our customers and others may seek to use our technology and intellectual property without the payment of license fees and royalties, which could weaken our competitive position, reduce our operating results and increase the likelihood of costly litigation. The growth of our business depends in large part on our ability to secure intellectual property rights in a timely manner, our ability to convince third parties of the applicability of our intellectual property rights to their products, and our ability to enforce our intellectual property rights.

In certain instances, we attempt to obtain patent protection for portions of our technology, and our license agreements typically include both issued patents and pending patent applications. If we fail to obtain patents in a timely manner or if the patents issued to us do not cover all of the inventions disclosed in our patent applications, others could use portions of our technology and intellectual property without the payment of license fees and royalties. For example, our business may suffer if we are unable to obtain patent protection in a timely manner from the PTO due to processing delays resulting from examiner turnover and a continuing backlog of patent applications.

We also rely on trade secret laws rather than patent laws to protect other portions of our proprietary technology. However, trade secrets can be difficult to protect. The misappropriation of our trade secrets or other proprietary information could seriously harm our business. We protect our proprietary technology and processes, in part, through confidentiality agreements with our employees, consultants, suppliers and customers. We cannot be certain that these contracts have not been and will not be breached, that we will be able to timely detect unauthorized use or transfer of our technology and intellectual property, that we will have adequate remedies for any breach, or that our trade secrets will not otherwise become known or be independently discovered by competitors. If we fail to use adequate mechanisms to protect our technology and intellectual property, or if a court fails to enforce our intellectual property rights, our business will suffer. We cannot be certain that these protection mechanisms can be successfully asserted in the future or will not be invalidated or challenged.

Further, the laws and enforcement regimes of certain countries may not protect our technology and intellectual property to the same extent as do the laws and enforcement regimes of the U.S. In certain jurisdictions we may be unable to protect our technology and intellectual property adequately against unauthorized use, which could adversely affect our business.

Our business may suffer if third parties assert that we violate their intellectual property rights.

Third parties may claim that either we or our customers are infringing upon their intellectual property rights. Even if we believe that such claims are without merit, they can be time-consuming and costly to defend against and will divert management’s attention and resources away from our business. Furthermore, third parties making such claims may be able to obtain injunctive or other equitable relief that could block our ability to further develop or commercialize some or all of our products or services in the U.S. and abroad. Claims of intellectual property infringement also might require us to enter into costly settlement or license agreements, pay costly damage awards, or defend or indemnify our customers against judgments, damages, or other losses. Even if we have an agreement that provides for a third party to indemnify us against such costs, the indemnifying party may be unable to perform its contractual obligations under the agreement. If we cannot or do not license the allegedly infringed intellectual property on reasonable terms, or need to substitute similar technology from another source, our business, financial position, results of operations and cash flows could suffer.

Our licensing cycle is lengthy and costly, and our marketing, legal and sales efforts may be unsuccessful.

We generally incur significant marketing, legal and sales expenses prior to entering into our license agreements, generating a license fee and establishing a royalty stream from each licensee. The length of time it takes to establish a new licensing relationship, and/or for our customers to incorporate certain of our technologies in their integrated circuits, can be 18 months or longer. As such, we may incur significant expenses in any particular period before any associated royalty or cash flow stream begins.

Our business incurs significant reverse engineering expenditures on products of potential licensees in order to prepare sales and marketing collateral. We employ intensive marketing and sales efforts to educate licensees, potential licensees and original equipment manufacturers about the benefits of our technologies. In addition, even if these companies adopt our technologies, they must devote significant resources to integrate fully our technologies into their operations. If our marketing and sales efforts are unsuccessful, then we may not be able to achieve widespread acceptance of our technology. In addition, ongoing litigation could impact our ability to gain new licensees which could have an adverse effect on our financial condition, results of operations and cash flows.

If our licensees delay, refuse to or are unable to make payments to us due to financial difficulties or otherwise, or shift their licensed products to other companies to lower their royalties to us, our operating results and cash flows could be adversely affected.

A number of companies in the semiconductor and consumer electronics industries face severe financial difficulties from time to time. As a result, there have been bankruptcies and restructuring of companies in these industries. As an example, in our quarter ended September 30, 2017 we recorded a bad debt charge for $1.6 million relating to past due receivables from two LeEco affiliates, based on our significant doubts about full collection due to substantial financial stress and negative payment history that these affiliates exhibited. Other customers may face similar financial difficulties which may result in their inability to make payments to us in a timely manner, or at all. In addition, we have had a history of, and we may in the future experience, customers that delay or refuse to make payments owed to us under license or settlement agreements. Our customers may also merge with or may shift the manufacture of licensed products to companies that are not currently licensees to us. This could make the collection process complex and difficult, which could adversely impact our business, financial condition, results of operations and cash flows.

Failure by the semiconductor industry to adopt our technology for the next generation high performance chips used in consumer electronics would significantly harm our business.

To date, our technology has been used by several companies in high performance semiconductor chips, including DRAM. For example, semiconductor packaging, circuitry and processing using our technology is used for DDR3 and DDR4 DRAM and we currently have customers who are paying royalties for DRAM chips in advanced packages.

We anticipate that royalties from shipments of next-generation semiconductor chips using our technology may account for a significant percentage of our future royalties. If semiconductor manufacturers do not continue to use our technology for the next-generation chips and find viable alternative technologies for use with next-generation chips, or if we do not receive royalties from the next-generation chips that use our technology, our future financial performance and cash flows could be adversely affected.

Our technology may be too expensive for certain next-generation semiconductor manufacturers, which could significantly reduce the adoption rate of our technology in next-generation chips. Even if our technology is selected for at least some of these next-generation chips, there could be delays in the introduction of products utilizing these chips that could materially affect the amount and timing of any royalty payments that we receive. Other factors that could affect adoption of our technology for next-generation semiconductor products include delays or shortages of materials and equipment and the availability of testing services.

Similarly, our audio licensing royalties from consumer electronics product manufacturers depends, in large part, upon the availability of ICs that implement our technologies. IC manufacturers incorporate our audio technologies into these ICs, which are then incorporated into consumer electronics products. We do not manufacture these ICs, but rather depend upon IC manufacturers to develop, produce and then sell them to licensed consumer electronics product manufacturers. We do not control the IC manufacturers' decisions whether or not to incorporate our technologies into their ICs, and we do not control their product development or commercialization efforts. If these IC manufacturers are unable or unwilling to implement our technologies into their ICs, production is delayed, or if they sell fewer ICs incorporating our technologies, our operating results and cash flows could be adversely affected.

The investment of our cash, cash equivalents and investments in marketable debt and equity securities are subject to risks which may cause losses and affect the liquidity of these investments.

At December 31, 2018, we held approximately $113.6 million in cash and cash equivalents and $40.7 million in investments. These investments include various financial securities such as corporate bonds and notes, municipal bonds and notes, commercial paper, treasury and agency notes and bills, and money market funds. In the third quarter of 2018, we initiated an equity position in Onkyo Corporation, a publicly traded company listed on the JASDAQ market of the Tokyo Stock Exchange. Upon making the investment, we hold a 6.3% ownership interest in Onkyo. Although we invest in high quality securities, ongoing financial events have at times adversely impacted the general credit, liquidity, market and interest rates for these and other types of debt securities. Changes in monetary policy by the Federal Reserve, government fiscal policies, and global economic and market conditions may adversely affect the value of our investment portfolio. While we have historically held our debt investments to maturity, we may in the future have a need to sell investments before their maturity dates, which could result in losses on the sale of those investments. For example, the DTS acquisition resulted in us liquidating a significant portion of our investments. The financial market and monetary risks associated with our investment portfolio may have a material adverse effect on our financial condition, results of operations and cash flows.

Our intellectual property business operates in a highly cyclical industry, which is subject to significant downturns.

The semiconductor and electronics industries in which our intellectual property business primarily operates has historically been cyclical and is characterized by wide fluctuations in product supply and demand. From time to time, this industry has experienced significant downturns, often in connection with, or in anticipation of, declining economic conditions, maturing product and technology cycles, and excess inventories. This cyclicality could cause our operating results to decline from one period to the next. Our business depends, in part, upon the volume of production by our customers, which, in turn, depends upon the current and anticipated market demand for semiconductors and products that use semiconductors. Semiconductor manufacturers, foundries, and package assembly companies generally sharply curtail their spending during industry downturns, and historically have lowered their spending more than the decline in their revenue. As a result, our financial results have been, and will continue to be, impacted by the cyclicality of the electronics industry. If we are unable to control our expenses adequately in response to lower royalties from our customers in such downturns, our results of operations and cash flows will be materially and adversely impacted.

If we are unable to maintain a sufficient amount of content released in the DTS audio format, demand for the technologies, products, and services that we offer to consumer electronics product manufacturers may significantly decline, which would adversely impact our business and prospects.

We expect to derive a significant percentage of our billings from the technologies, products, and services that we offer to manufacturers of consumer electronics products. We believe that demand for our audio technologies in growing markets for multi-channel and/or high resolution audio, including TVs, tablets, mobile phones, video game consoles, automobiles, and soundbars, will be based on the amount, quality, and popularity of content (such as movies, TV shows, music, and games) either released in the DTS audio format or capable of being coded and played in the DTS format. In particular, our ability to penetrate the growing markets in the network-connected space depends on the presence of streaming and downloadable content released in the DTS audio format. We generally do not have contracts that require providers of streaming and downloadable content to develop and release such content in a DTS audio format. Accordingly, our billings could decline if these providers elect not to incorporate DTS audio into their content or if they sell less content that incorporates DTS audio.

In addition, we may not be successful in maintaining existing relationships or developing new relationships with other existing or new content providers. As a result, we cannot assure you that a sufficient amount of content will be released in a DTS audio format to ensure that manufacturers continue offering DTS decoders in the consumer electronics products that they sell.

Demand for our HD Radio technology may be insufficient to sustain projected growth.

Demand for and adoption of HD Radio technology may not be sufficient for us to continue to increase the number of customers of our HD Radio system, which include IC manufacturers, manufacturers of broadcast transmission equipment, consumer electronics products manufacturers, component manufacturers, data service providers, manufacturers of specialized and test equipment and radio broadcasters.

Among other things, continuing and increased consumer acceptance of HD Radio technology will depend upon:

- the number of radio stations broadcasting digitally using HD Radio technology;
- the willingness of automobile manufacturers to include HD Radio receivers in their vehicles;
- the willingness of manufacturers to incorporate HD Radio technology into their products;

- the cost and availability of HD Radio enabled products; and
- the marketing and pricing strategies that we employ and that are employed by our customers and retailers.

Demand for HD Radio also may be impacted by declines in the automotive industry which historically has been cyclical and experienced downturns during declining economic conditions.

If demand for HD Radio technology does not continue to increase as expected, we may not be able to increase our DTS royalties as projected.

Our HD Radio technology may not remain competitive if we do not respond to changes in technology, standards and services that affect the radio broadcasting industry.

The radio broadcasting industry is subject to technological change, evolving industry standards, regulatory restrictions and the emergence of other media technologies and services. Our HD Radio technology may not gain market acceptance over these other technologies. Various other audio technologies and services that have been developed and introduced include:

- internet streaming, cable-based audio programming and other digital audio broadcast formats;
- satellite delivered digital audio radio services that offer numerous programming channels;
- other digital radio competitors, such as Digital Radio Mondiale, or DAB; and
- growth in use of portable devices for storage and playback of audio content.

Competition arising from these or other technologies or potential regulatory change may have an adverse effect on the radio broadcasting industry or on our company and our financial condition and results of operations.

If we are unable to further penetrate the streaming and downloadable content delivery markets and adapt our technologies for those markets, our royalties and ability to grow our audio business could be adversely impacted.

Video and audio content has historically been purchased and consumed primarily via optical disc-based media. However, the growth of the internet and network-connected device usage, along with the rapid advancement of online and mobile content delivery has resulted in download and streaming services becoming mainstream with consumers in various parts of the world. We expect the shift away from optical disc-based media to streaming and downloadable content consumption to continue. If we fail to continue to penetrate the streaming and downloadable content delivery market, our audio business could suffer.

The services that provide content from the cloud are not generally governed by international or national standards and are thus free to choose any media format(s) to deliver their products and services. This freedom of choice on the part of online content providers could limit our ability to grow if such content providers do not incorporate our technologies into their services, which could affect demand for our technologies.

Furthermore, our inclusion in mobile and other network-connected devices may be less profitable for us than optical disc players. The online and mobile markets are characterized by intense competition, evolving industry standards and business and distribution models, disruptive software and hardware technology developments, frequent new product and service introductions, short product and service life cycles, and price sensitivity on the part of consumers, all of which may result in downward pressure on pricing. If we are unable to adequately and timely respond to the foregoing, our business and operating results could be adversely affected.

Changes in financial accounting or taxation standards, rules, practices or interpretations may cause adverse unexpected revenue and expense fluctuations which may impact our reported results of operations.

We prepare our consolidated financial statements in accordance with U.S. generally accepted accounting principles (GAAP). These principles are subject to interpretations by the SEC and various accounting bodies. In addition, we are subject to various taxation rules in many jurisdictions. The existing taxation rules are generally complex, frequently changing and subject to interpretation. Changes to taxation rules, changes to financial accounting standards, or any changes to the interpretations of these standards or rules may adversely affect our reported financial results or the way in which we conduct business. Recent accounting pronouncements and their estimated potential impact on our business are addressed in Note 3 - *"Recent Accounting Pronouncements"* in the Notes to Consolidated Financial Statements.

In May 2014, the Financial Accounting Standards Board ("FASB") issued ASU 2014-09, "Revenue from Contracts with Customers" ("ASU 2014-09"), and since May 2014 the FASB has issued amendments to this new guidance, which collectively provide guidance for revenue recognition. ASU 2014-09 became effective for us beginning January 1, 2018 and we adopted the new standard under the modified retrospective approach. Under the new standard, the historical practice of many licensing companies of reporting revenue from per-unit royalty-based agreements one quarter in arrears is no longer accepted and instead companies must now estimate royalty-based revenue. This guidance significantly impacts our revenue recognition. First, we are no longer allowed to follow our past practice of recording per unit license revenue on a quarter lag basis, a practice precipitated by the lack of reliable estimates for such revenue. Estimating per unit royalty revenue prior to receiving the licensee's royalty report requires us to make significant assumptions and judgments and could cause significant fluctuations of royalty revenue on a quarterly basis. Second, we are now required to record all or a significant majority of revenue under our fixed fee and minimum guarantee license agreements when such agreements are effective rather than recording them over time as was our past practice and which generally aligned revenue more closely with the billing cycle and cash flows from such agreements. While the changes in revenue recognition do not impact our cash flows, the impact on our Statement of Operations under the new accounting standard may impact how investors perceive our business which could materially impact the value of our common stock.

On December 22, 2017, the Tax Cuts and Jobs Act ("Tax Act") was signed into law. The Tax Act introduced a broad range of tax reform measures that significantly changed the federal income tax laws. Many provisions in the Tax Act are generally effective in tax years beginning after December 31, 2017. We continue to analyze additional information and new guidance issued by relevant authorities related to the Tax Act. The prospects of supplemental legislation or regulatory processes to address uncertainties that arise because of the Tax Act, or evolving technical interpretations of the tax law, may cause our financial statements to be impacted in the future. In addition, the measurement period allowed by Staff Accounting Bulletin ("SAB") No. 118 has closed during the fourth quarter of 2018 with no material impact. We will continue to analyze the effects of the Tax Act as subsequent guidance continues to emerge.

Our future effective tax rate may be affected by such factors as changes in tax laws, changing interpretation and new guidance related to the Tax Act, withholding taxes determinations by foreign tax authorities, the impact of accounting for stock-based compensation, the impact of accounting for business combinations, changes in the composition of global earnings, the expiration of statute of limitations, settlements of audits, changes in our domestic and international organization and changes in overall levels of income before tax.

Our effective tax rate depends on our ability to secure the tax benefits of our international corporate structure, on the application of the tax laws of various jurisdictions and on how we operate our business.

Our international corporate structure and intercompany arrangements, including the manner in which we market, develop, use and license our intellectual property, fund our operations and structure transactions with our international subsidiaries, may result in the increase or reduction of our worldwide effective tax rate. Such international corporate structure and intercompany arrangements are subject to examination by the tax authorities of the jurisdictions in which we operate, including the United States. The application of the tax laws of these jurisdictions to our international business activities is subject to interpretation and depends on our ability to operate our business in a manner consistent with our corporate structure and intercompany arrangements. Moreover, such tax laws are subject to change. Tax authorities may disagree with our intercompany transfer pricing arrangements, including our transfer of intangibles, or determine that the manner in which we operate our business does not achieve the intended tax consequences. Additionally, current and future changes in the tax laws or interpretations may have an adverse effect on our international corporate structure and operations. The result of an adverse determination of any of the above items could increase our worldwide effective tax rate and harm our financial position and results of operations.

We have in the past recorded, and may in the future record, significant valuation allowances on our deferred tax assets, and the recording and release of such allowances may have a material impact on our results of operations.

The need for a valuation allowance requires an assessment of both positive and negative evidence on a jurisdiction-by-jurisdiction basis when determining whether it is more-likely-than-not that deferred tax assets are recoverable. In making such assessment, significant weight is given to evidence that can be objectively verified. In the future, new facts and circumstances and new guidance related to the Tax Act may require us to re-evaluate our valuation allowance positions which could potentially affect our effective tax rate.

We continue to monitor the likelihood that we will be able to recover our deferred tax assets, including those for which a valuation allowance is recorded. There can be no assurance that we will generate profits in future periods enabling us to fully realize our deferred tax assets. The timing of recording a valuation allowance or the reversal of such valuation allowance is subject to objective and subjective factors that cannot be readily predicted in advance. Both the establishment of a valuation allowance and the reversal of a previously recorded valuation allowance may have a material impact on our financial results.

The international nature of our business exposes us to financial and regulatory risks that may have a negative impact on our consolidated financial position, results of operations and cash flows, and we may have difficulty protecting our intellectual property in some foreign countries.

We derive a significant portion of our royalties from licensees headquartered outside of the U.S. We also have operations outside of the U.S., including our research and development facilities in Ireland, Romania and the United Kingdom, to design, develop, test or market certain technologies. International operations are subject to a number of risks, including but not limited to the following:

- changes in trade protection laws, policies and measures, and other regulatory requirements affecting trade and investment;
- regulatory requirements and prohibitions that differ between jurisdictions;
- laws and business practices favoring local companies;
- withholding tax obligations on license royalties that we may not be able to offset fully against our U.S. tax obligations, including the further risk that foreign tax authorities may re-characterize license fees or increase tax rates, which could result in increased tax withholdings and penalties;
- security concerns, including crime, political instability, terrorist activity, armed conflict and civil or military unrest;
- differing employment practices, labor issues and business and cultural factors;
- less effective protection of intellectual property than is afforded to us in the U.S. or other developed countries; and
- limited infrastructure and disruptions, such as large-scale outages or interruptions of service from utilities or telecommunications providers.

Our intellectual property is also used in a large number of foreign countries. There are many countries in which we currently have no issued patents. In addition, effective intellectual property enforcement may be unavailable or limited in some foreign countries. It may be difficult for us to protect our intellectual property from misuse or infringement by other companies in these countries. We expect this to become a greater problem for us as our licensees increase their manufacturing and sales in countries which provide less protection for intellectual property. Our inability to enforce our intellectual property rights in some countries may harm our business, financial position, results of operations and cash flows.

Our business and operating results may be harmed if we are unable to manage growth in our business, if we undertake any restructuring activities or if we dispose of a business division or dispose of or discontinue any product lines.

We have in the past expanded our operations, domestically and internationally, and may continue to do so through both internal growth and acquisitions. In December 2016, we acquired DTS, resulting in our headcount more than doubling year over year. If our growth continues, it may place a significant strain on our management team and on our operational and financial systems, procedures, and controls. Our future success will depend, in part, upon the ability of our management team to manage any growth effectively, requiring our management to:

- recruit, hire, and train additional personnel;
- implement and improve our operational and financial systems, procedures, and controls;
- maintain our cost structure at an appropriate level based on the royalties, billings and cash we forecast and generate;
- manage multiple concurrent development projects; and
- manage operations in multiple time zones with different cultures and languages.

If we are unable to effectively manage our growth or we are unsuccessful in recruiting and retaining personnel, our business and operating results will be harmed. Moreover, if our acquisitions or other growth initiatives do not prove to be profitable, we may undertake to restructure our business, including the disposition of a business division, or the disposition or discontinuance of a product line. Any restructuring, disposition or discontinuance would require substantial management time and attention and may divert management from other important work, and may result in significant liabilities and costs as described earlier.

Disputes regarding our intellectual property may require us to defend or indemnify certain customers or licensees, the cost of which could adversely affect our business operations and financial condition.

While we generally do not defend or indemnify our customers, some of our license agreements in our imaging and audio businesses provide limited defense and indemnities for certain actions brought by third parties against our customers, and some require us to provide technical support and information to a customer that is involved in litigation for using our technology. Our defense, indemnity and support obligations could result in substantial expenses. In addition to the time and expense required for us to defend, indemnify or supply such support to our customers, a customer's development, marketing and sales of licensed image or audio products could be severely disrupted or shut down as a result of litigation, which in turn could have a material adverse effect on our business operations, consolidated financial position, results of operations and cash flows.

If we lose any of our key personnel or are unable to attract, train and retain qualified personnel, we may not be able to execute our business strategy effectively.

Our success depends, in large part, on the continued contributions of our key management, engineering, sales, marketing, intellectual property, legal and finance personnel, many of whom are highly skilled and would be difficult to replace. None of our senior management, key technical personnel or key sales personnel are bound by written employment contracts to remain with us for a specified period. In addition, we do not currently maintain key-person life insurance covering our key personnel or have restrictions on their post-employment ability to solicit our employees, contractors or customers if key personnel voluntarily terminate their employment. The loss of any of our senior management or other key personnel could harm our ability to implement our business strategy and respond to the rapidly changing market conditions in which we operate. Our future success will depend to a significant extent on the ability of these executives to effectively drive execution of our business strategy, and on the ability of our management team to work together effectively.

Our success also depends on our ability to attract, train and retain highly skilled managerial, engineering, sales, marketing, legal and finance personnel and on the abilities of new personnel to function effectively, both individually and as a group. Competition for qualified senior employees can be intense. We have also experienced difficulty in hiring and retaining highly skilled engineers with appropriate qualifications to support our growth and expansion. Further, we must train our new personnel, especially our technical support personnel, to respond to and support our licensees and customers. If we fail to do this, it could lead to dissatisfaction among our licensees or customers, which could slow our growth or result in a loss of business.

Our business operations could suffer in the event of information technology system failures or security breaches.

Despite system redundancy and the implementation of security measures within our internal and external information technology and networking systems, our information technology systems may be subject to security breaches, unauthorized access (malicious or accidental), misuse of information by authorized users, data leaks or unintentional exposure of information, failed process, loss of data, damages from computer viruses or malware, natural disasters, terrorism, telecommunication failures or disruption of service. Any system failure or security breach could cause interruptions in our operations in addition to the possibility of losing proprietary information and trade secrets. To the extent that any disruption or security breach results in inappropriate disclosure of our confidential information, we may incur liability or additional costs to remedy the damages caused by these disruptions or security breaches.

Decreased effectiveness of share-based compensation could adversely affect our ability to attract and retain employees.

We have historically used stock options, restricted stock grants and other forms of stock-based compensation as key components of employee compensation in order to align employees' interests with the interests of our stockholders, encourage employee retention and provide competitive compensation and benefit packages. We incur significant compensation costs associated with our stock-based compensation programs. Failure to obtain stockholder approval of equity compensation plans or changes to the plans could make it harder or more expensive for us to grant stock-based compensation to employees in the future. As a result, we may find it difficult to attract, retain and motivate employees, and any such difficulty could have a materially adverse impact on our business.

Failure to comply with environmental regulations could harm our business.

We use hazardous substances in the manufacturing and testing of prototype products and in the development of technologies in our research and development laboratories. We are subject to a variety of local, state and federal regulations relating to the storage, discharge, handling, emission, generation, manufacture and disposal of toxic or other hazardous substances. Our past, present or future failure to comply with environmental regulations could result in the imposition of substantial fines, suspension of production, and alteration of our manufacturing processes or cessation of operations. Compliance with such regulations could require us to acquire expensive remediation equipment or to incur other substantial expenses. Any failure to control the use, disposal, removal or storage of, or to adequately restrict the discharge of, or assist in the cleanup of, hazardous or toxic substances, could subject us to significant liabilities, including joint and several liabilities under certain statutes. The imposition of such liabilities could significantly harm our business, financial position, results of operations and cash flows.

We have business operations located in places that are subject to natural disasters.

Our business operations depend on our ability to maintain and protect our facilities, computer systems and personnel. Our corporate headquarters are located in the San Francisco Bay Area and we have engineering activities in several locations throughout California, which in the past have experienced severe earthquakes. We do not carry earthquake insurance for any of our facilities except for our office in Calabasas, California. Earthquakes or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects.

We have made and may continue to make or to pursue acquisitions which could divert management's attention, cause ownership dilution to our stockholders, or be difficult to integrate, which may adversely affect our financial results.

We have made several acquisitions, and it is our current plan to continue to acquire companies, assets, patents and technologies that we believe are strategic to our future business. For example, in the fourth quarter of 2016, we acquired DTS, Inc., for approximately $955 million. Investigating businesses, assets, patents or technologies and integrating newly acquired businesses, assets, patents or technologies could put a strain on our resources, could be costly and time consuming, and might not be successful. Such activities divert our management's attention from other business concerns. In addition, we might lose key employees while integrating new organizations or operations. Acquisitions could also result in customer dissatisfaction, performance problems with an acquired company or technology, potentially dilutive issuances of equity securities or the incurrence of debt, the assumption or incurrence of contingent liabilities, impairment charges related to goodwill and possible impairment charges related to other intangible assets or other unanticipated events or circumstances, any of which could harm our business.

Our plans to integrate and expand upon research and development programs and technologies obtained through acquisitions may result in products or technologies that are not adopted by the market. The market may adopt competitive solutions to our products or technologies. Consequently, we might not be successful in integrating any acquired businesses, assets, products or technologies, and might not achieve anticipated revenue and cost benefits.

There are numerous risks associated with our acquisitions of businesses, technologies and patents.

We have made a number of acquisitions of businesses, technologies and patents in recent years. These acquisitions are subject to a number of risks, including but not limited to the following:

- these acquisitions could fail to produce anticipated benefits or could have other adverse effects that we currently do not foresee. As a result, these acquisitions could result in a reduction of net income per share as compared to the net income per share we would have achieved if these acquisitions had not occurred. We may also be required to recognize impairment charges of acquired assets or goodwill, and if we decide to restructure acquired businesses, we may incur other restructuring charges;
- the purchase price for each acquisition is determined based on significant judgment on factors such as projected cash flow, quality and availability of the business, technology or patent. In addition, if other companies have similar interests in the same business, technology or patent, our ability to negotiate these acquisitions at favorable terms may be limited and the purchase price may be artificially inflated;
- following completion of these acquisitions, we may uncover additional liabilities, patent validity, infringement or enforcement issues or unforeseen expenses not discovered during our diligence process;
- any such additional liabilities, patent validity, infringement or enforcement issues or expenses could result in significant unanticipated costs not originally estimated, such as impairment charges of acquired assets and goodwill, and may harm our financial results;
- the integration of technologies, patent assets and personnel, if any, will be a time consuming and expensive process that may disrupt our operations if it is not completed in a timely and efficient manner. If our integration efforts are not successful, our results of operations could be harmed, employee morale could decline, key employees could leave, and customer relations could be damaged. In addition, we may not achieve anticipated synergies or other benefits from any of these acquisitions;
- we have incurred substantial direct transaction and integration costs as a result of past acquisitions. In future acquisitions, the total direct transaction costs and the costs of integration may exceed our expectations;
- sales by the acquired businesses may be subject to different accounting treatment than our existing businesses, especially related to the recognition of revenue. This may lead to the loss or deferral of revenue under current and emerging accounting standards;
- there may be a significant time lag between acquiring patent assets and recognizing royalties from those patent assets. During that time lag, material costs are likely to be incurred in preparing licensing or litigation efforts and amortization of acquired patent assets that would have a negative effect on our results of operations, cash flows and financial position;
- we may require external financing that is dilutive or presents risks of debt; and
- we are required to estimate and record fair values of contingent assets, liabilities, deferred tax assets and liabilities at the time of an acquisition. Even though these estimates are based on management's best judgment, the actual results may differ. Under the current accounting guidance, differences between actual results and management's estimate could cause our operating results to fluctuate or could adversely affect our results of operations.

If our amortizable intangible assets (such as acquired patents) become impaired, we may be required to record a significant charge to earnings.

In addition to internal development, we intend to broaden our intellectual property portfolio through strategic relationships and acquisitions such as the acquisitions of DTS, Inc. in the fourth quarter of 2016. We believe these strategic relationships and acquisitions will enhance the competitiveness and size of our current businesses and provide diversification into markets and technologies that complement our current businesses. Future acquisitions could be in the form of asset purchases, equity investments, or business combinations. As a result, we may have intangible assets which are amortized over their estimated useful lives. We review our amortizable intangible assets (such as our patent portfolio) for impairment when events or changes in circumstances indicate the carrying value may not be recoverable or the useful life is shorter than originally estimated. Factors that may be considered a change in circumstances indicating that the carrying value of our amortizable or other intangible assets may not be recoverable include a decline in future cash flows, fluctuations in market capitalization, slower growth rates in our industry or slower than anticipated adoption of our products by our customers. As we continue to review for factors that may affect our business which may not be in our control, we may be required to record a significant charge to earnings in our financial statements during the period in which any impairment of our amortizable intangible assets or equity investments is determined, resulting in an adverse impact on our business, financial position, or results of operations.

Current and future governmental and industry standards may significantly limit our business opportunities.

Technology standards are important in the audio and video industry as they help to assure compatibility across a system or series of products. Generally, standards adoption occurs on either a mandatory basis, requiring a particular technology to be available in a particular product or medium, or an optional basis, meaning that a particular technology may be, but is not required to be, utilized. If standards are re-examined or a new standard is developed in which we are not included, our growth in that area of our business could be significantly lower than expected.

As new technologies and entertainment media emerge, new standards relating to these technologies or media may develop. New standards may also emerge in existing markets that are currently characterized by competing formats, such as the market for PCs. We may not be successful in our efforts to include our technology in any such standards.

Changes in or failure to comply with FCC requirements could adversely impact our HD Radio revenue and royalties.

In October 2002, the Federal Communications Commission, or the FCC, selected our “In-Band, On-Channel” (“IBOC”) technology, also known as “HD Radio technology,” as the exclusive technology for introduction of terrestrial digital operations by AM and FM radio stations. In the United States, the FCC regulates the broadcast radio industry, interprets laws enacted by Congress and establishes and enforces regulations governing radio broadcasting. It is unclear what rules and regulations the FCC may adopt regarding digital audio broadcasting and what effect, if any, such rules and regulations will have on our Product Licensing segment, the operations of stations using our HD Radio technology or consumer electronics manufacturers. Any additional rules and regulations imposed on digital audio broadcasting could adversely impact the attractiveness of HD Radio technology and negatively impact our business. Also, non-compliance by us, or by radio stations offering HD Radio broadcasts, with any FCC requirements or conditions could result in fines, additional license conditions, license revocation or other detrimental FCC actions.

Our licensing of industry standard technologies can be subject to limitations that could adversely affect our business and prospects.

When a standards-setting body adopts our technologies as explicit industry standards, we generally must agree to license such technologies on a fair, reasonable and non-discriminatory basis, which we believe means that we treat similarly situated customers similarly. In these situations, we may be required to limit the royalty rates we charge for these technologies, which could adversely affect our business. Furthermore, we may have limited control over whom we license such technologies to and may be unable to restrict many terms of the license. From time to time, we may be subject to claims that our licenses of our industry standard technologies may not conform to the requirements of the standards-setting body. Claimants in such cases could seek to restrict or change our licensing practices or our ability to license our technologies in ways that could harm our reputation and otherwise materially and adversely affect our business, operating results and prospects.

Our financial and operating results may vary, which may cause the price of our common stock to decline.

Our quarterly operating results have fluctuated in the past and are likely to do so in the future. Because our operating results are difficult to predict, one should not rely on quarterly or annual comparisons of our results of operations as an indication of our future performance. Factors that could cause our operating results to fluctuate during any period or that could adversely affect our ability to achieve our strategic objectives include those listed in this "*Risk Factors*" section of this report and the following:

- the timing of, and compliance with license or service agreements and the terms and conditions for payment to us of license or service fees under these agreements;
- fluctuations in our royalties caused by the pricing terms of certain of our license agreements;
- the amount of our product and service revenue;
- changes in the level of our operating expenses;
- delays in our introduction of new technologies or market acceptance of these new technologies through new license agreements;
- our ability to protect or enforce our intellectual property rights or the terms of our agreements;
- legal proceedings affecting our patents, patent applications or license agreements;
- the timing of the introduction by others of competing technologies;
- changes in demand for semiconductor chips in the specific end markets in which we concentrate;
- changes in demand for camera-enabled devices including cell phones, security systems and personal computers;
- the timing of the conclusion of license agreements;
- the length of time it takes to establish new licensing arrangements;
- meeting the requirements for revenue recognition under generally accepted accounting principles;
- changes in generally accepted accounting principles including new accounting standards which may materially affect our revenue recognition and the comparability between revenue recognition and cash flow from customer royalties; and
- cyclical fluctuations in semiconductor markets generally.

Due to fluctuations in our operating results, reports from market and security analysts, litigation-related developments, and other factors, the price at which our common stock will trade is likely to continue to be highly volatile. In future periods, if our revenue, royalties, billings, cash flows or operating results are below the estimates or expectations of public market analysts and investors, our stock price could decline.

We may not continue to pay dividends at the same rate we are currently paying them, or at all, and any decrease in or suspension of the dividend could cause our stock price to decline.

We currently pay a quarterly dividend of $0.20 per share. We also have returned capital to shareholders through stock repurchases. We anticipate that all quarterly dividends and stock repurchases will be paid out of cash, cash equivalents and short-term investments. The payment of future cash dividends is subject to the final determination each quarter by our Board of Directors that the dividend remains in our best interests, which determination will be based on a number of factors, including our earnings, financial condition, actual and forecasted cash flows, capital resources and capital requirements, alternative uses of capital, economic condition and other factors considered relevant by management and the Board of Directors. Any decrease in the amount of the dividend, or suspension or discontinuance of payment of a dividend, could cause our stock price to decline.

Our stock repurchase program could increase the volatility of the price of our common stock, and the program may be suspended or terminated at any time, which may cause the trading price of our common stock to decline.

In August 2007, we authorized a plan to repurchase our outstanding shares of common stock dependent on market conditions, share price and other factors. As of December 31, 2018, the total amount available for repurchase under the plan was $101.4 million.

The amount of repurchases under our stock repurchase program will vary. In 2016, we repurchased approximately 2,300,000 shares for an aggregate amount of $67.7 million. In 2017, we repurchased approximately 654,000 shares for an aggregate amount of $15.3 million. In 2018, we repurchased approximately 2,137,000 shares for an aggregate amount of $41.4 million. Additionally, the timing of repurchases is at our discretion and the program may be suspended or discontinued at any time. Any suspension or discontinuation could cause the market price of our stock to decline. The timing of repurchases pursuant to our stock repurchase program could affect our stock price and increase its volatility. There can be no assurance that any stock repurchases will enhance stockholder value because the market price of our common stock may decline below the levels at which we effected repurchases. Furthermore, we may engage in mergers, acquisitions, or other activity that could result in us reducing or discontinuing share repurchases for a period of time. For example, the DTS acquisition resulted in a significant decrease in cash, cash equivalents and short-term investments, as well as the issuance of approximately $600 million in debt. The terms of our current or future debt agreements could limit our ability to repurchase shares.

Provisions of our certificate of incorporation and bylaws or Delaware law might delay or prevent a change of control transaction and depress the market price of our stock.

Various provisions of our certificate of incorporation and bylaws might have the effect of making it more difficult for a third party to acquire, or discouraging a third party from attempting to acquire, control of our company. These provisions could limit the price that certain investors might be willing to pay in the future for shares of our common stock. Certain of these provisions eliminate cumulative voting in the election of directors, authorize the board to issue "blank check" preferred stock, prohibit stockholder action by written consent, eliminate the right of stockholders to call special meetings, and establish advance notice procedures for director nominations by stockholders and the submission of other proposals for consideration at stockholder meetings. We are also subject to provisions of Delaware law that could delay or make more difficult a merger, tender offer or proxy contest involving our company. In particular, Section 203 of the Delaware General Corporation Law prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years unless specific conditions are met. Any of these provisions could have the effect of delaying, deferring or preventing a change in control, including without limitation, discouraging a proxy contest or making more difficult the acquisition of a substantial block of our common stock.

Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

Our principal corporate headquarters, which houses administrative, sales, marketing and research and development facilities, are located in San Jose, California, and are held under an operating lease. We own real property, including an approximately 89,000 square foot building, in Calabasas, California, which houses additional administrative, sales, marketing, research and development facilities. We lease smaller facilities in other locations including the United States, Republic of Ireland, Romania, Hong Kong, China, the United Kingdom, Japan, South Korea, Taiwan, Singapore and Mexico. We believe that our existing space is adequate for our current operations. We believe that suitable replacement and additional space, to the extent needed, will be available in the future on commercially reasonable terms.

Item 3. Legal Proceedings

Other than to the extent the proceedings described below have concluded, we cannot predict the outcome of any of the proceedings described below. An adverse decision in any of these proceedings could significantly harm our business and our consolidated financial position, results of operations, and cash flows.

Tessera, Inc. v. Toshiba Corporation, Civil Action No. 5:15-cv-02543-BLF (N.D. Cal.)

On May 12, 2015, Tessera, Inc. filed a complaint against Toshiba Corporation ("Toshiba") in California Superior Court. Tessera, Inc.'s complaint alleges causes of action for breach of contract, breach of the implied covenant of good faith and fair dealing, and declaratory relief, generally alleging that Toshiba underpaid royalties and failed to cooperate with audits conducted pursuant to the parties' license agreement.

On June 8, 2015, Toshiba removed the action to the U.S. District Court for the Northern District of California. On June 18, 2015, Toshiba filed its answer, affirmative defenses, and counterclaims to Tessera, Inc.'s complaint. Toshiba alleges counterclaims for declaratory judgment and breach of the implied warranty of good faith and fair dealing. The counterclaims seek, among other things, judicial determinations about the interpretation of the parties' agreement, termination of the agreement, an accounting of the amount of alleged overpayments by Toshiba, restitution, and damages. On July 10, 2015, Tessera, Inc. filed its answer and affirmative defenses to Toshiba's counterclaims. On March 17, 2016, Tessera, Inc. filed an amended complaint adding a claim for declaratory relief regarding a February 12, 2016 letter sent by Toshiba to Tessera, Inc. purporting to terminate the parties' license agreement. On March 18, 2016, Toshiba filed its amended answer, affirmative defenses, and counterclaims. On April 4, 2016, Tessera, Inc. filed an answer to Toshiba's amended counterclaims.

An initial summary judgment hearing on contract issues took place on September 22, 2016. On November 7, 2016, the Court entered an order granting Toshiba's motion regarding the definition of "TCC," and denying summary judgment on the other issues raised by the parties' cross-motions. On December 6, 2016, Tessera, Inc. filed a motion pursuant to Federal Rule of Civil Procedure 54(b) seeking authorization to appeal the order and for a stay. On March 6, 2017, the Court granted the Rule 54(b) motion. The Court subsequently vacated the trial date and stayed the remainder of the district court proceedings.

On April 4, 2017, Tessera, Inc. filed a notice of appeal to the U.S. Court of Appeals for the Ninth Circuit. On November 21, 2018, the Ninth Circuit dismissed the appeal for lack of appellate jurisdiction and remanded the case to the district court for further proceedings.

A case management conference is scheduled for March 7, 2019, and a summary judgment hearing is scheduled for August 8, 2019. No trial date has yet been scheduled.

Tessera Advanced Technologies, Inc. v. Samsung Electronics America, Inc. et al, Civil Action No. 2:17-cv-07621 (D. N.J.)

On September 28, 2017, Tessera Advanced Technologies, Inc. filed a complaint against Samsung Electronics America, Inc. and Samsung Electronics Co., Ltd. (collectively, "Samsung") in the U.S. District Court for the District of New Jersey. The complaint alleged that Samsung infringes U.S. Patent Nos. 6,954,001 and 6,784,557 and requested, among other things, that Samsung be ordered to pay compensatory damages. On November 22, 2017, Samsung filed an unopposed motion to stay the action pending resolution of a U.S. International Trade Commission investigation involving the same patents. On November 27, 2017, the Court granted Samsung's motion. In December 2018, the parties reached a global settlement and the Court dismissed the case. This matter is now concluded.

Invensas Corporation v. Samsung Electronics Co., Ltd., et al., Civil Action No. 1:17-cv-01363 (D. Del.)

On September 28, 2017, Invensas Corporation filed a complaint against Samsung Electronics Co., Ltd. and Samsung Austin Semiconductor, LLC (collectively, "Samsung") in the U.S. District Court for the District of Delaware. The complaint alleges that Samsung infringes U.S. Patent Nos. 6,232,231 and 6,849,946 and requested, among other things, that Samsung be ordered to pay compensatory damages. On December 19, 2017, Samsung filed an Answer and Affirmative Defenses.

On July 27, 2018, Samsung filed a motion to stay pending determination of *inter partes* review of the patents-in-suit. The Court denied the motion on October 2, 2018.

A claim construction hearing was held on October 10, 2018. In December 2018, the parties reached a global settlement and the Court terminated the case. This matter is now concluded.

Invensas Bonding Technologies, Inc. v. Samsung Electronics America, Inc., et al., Civil Action No. 1:17-cv-07609 (D. N.J.)

On September 28, 2017, Invensas Bonding Technologies, Inc. filed a complaint against Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd. (collectively, "Samsung") in the U.S. District Court for the District of New Jersey. The complaint alleged that Samsung infringes U.S. Patent Nos. 7,553,744, 7,807,549, 7,871,898, 8,153,505, 9,391,143, and 9,431,368 and requested, among other things, that Samsung be ordered to pay compensatory damages. On December 19, 2017, Samsung filed an Answer and Affirmative Defenses. In December 2018, the parties reached a global settlement and the Court terminated the case. This matter is now concluded.

FotoNation Limited, et al v. Samsung Electronics Co., Ltd., et al, Civil Action No. 2:17-cv-00669 (E.D. Tex.)

On September 28, 2017, FotoNation Limited and DigitalOptics Corporation MEMS (collectively, "FotoNation") filed a complaint against Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd. (collectively, "Samsung") in the U.S. District Court for the Eastern District of Texas. FotoNation amended its complaint several times, and on March 16, 2018, filed a third amended complaint. Each complaint alleged that Samsung infringes U.S. Patent Nos. 8,254,674, 8,331,715, 7,860,274, 7,697,829, 7,574,016, 7,620,218, 7,916,897 and 8,908,932, and requested, among other things, that Samsung be ordered to pay compensatory damages. Samsung answered all the complaints.

On February 1, 2018, Samsung filed a motion to transfer the action to the U.S. District Court for the District of Delaware. On March 23, 2018, Samsung filed a motion to dismiss certain counts of the third amended complaint. A hearing on the motions was held on May 16, 2018. On October 11, 2018, Samsung filed a motion to stay pending determination of *inter partes* review of the patents-in-suit. A claim construction hearing was held on October 3, 2018. In December 2018, the parties reached a global settlement and the Court dismissed the case. This matter is now concluded.

Invensas Corporation v. Samsung Electronics Co., Ltd., et al., Civil Action No. 2:17-cv-00670 (E.D. Tex.)

On September 28, 2017, Invensas Corporation filed a complaint against Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. ("Samsung") in the U.S. District Court for the Eastern District of Texas. The complaint alleged that Samsung infringes U.S. Patent Nos. 6,232,231 (the "'231 patent"), 6,849,946 (the "'946 patent"), 6,054,336, 6,566,167, and 6,825,554 and requested, among other things, that Samsung be ordered to pay compensatory damages. On December 19, 2017, Samsung filed an Answer and Affirmative Defenses to the Complaint.

On February 1, 2018, Samsung filed a motion to sever and stay proceedings for the '231 and '946 patents. On August 16, 2018, the Court denied the motion, and on August 30, 2018, Samsung filed an objection to the order.

On July 27, 2018, Samsung filed a motion to stay pending determination of *inter partes* review of the patents-in-suit. The court denied the motion on November 6, 2018.

A claim construction order issued on October 26, 2018.

On February 1, 2018, Samsung filed a motion to transfer the action to the U.S. District Court for the District of Delaware. On August 14, 2018, the Court denied the motion, and on September 10, 2018, Samsung filed a renewed motion to transfer. A hearing was held on the renewed motion on October 12, 2018. On November 7, 2018, the Court granted Samsung's renewed motion to transfer. On December 11, 2018, the case was transferred to the U.S. District Court for the District of Delaware and docketed as civil case number 1:18-cv-01947. On that same date the parties stipulated to dismiss the case pursuant to a global settlement. On December 12, 2018, the Court closed the case pursuant to the stipulation. This matter is now concluded.

Tessera Advanced Technologies, Inc. v. Samsung Electronics Co., Ltd., et al., Civil Action No. 2:17-cv-00671 (E.D. Tex.)

On September 28, 2017, Tessera Advanced Technologies, Inc. ("Tessera") filed a complaint against Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. ("Samsung") in the U.S. District Court for the Eastern District of Texas. The complaint alleged that Samsung infringes U.S. Patent Nos. 6,512,298 and 6,825,616 and requested, among other things, that Samsung be ordered to pay compensatory damages. On December 19, 2017, Samsung filed an Answer and Affirmative Defenses to the Complaint.

On February 1, 2018, Samsung filed a motion to transfer the action to the U.S. District Court for the District of Delaware. The Court granted the motion on September 5, 2018. On September 11, 2018, Tessera filed a motion for reconsideration of the court's order. On September 14, 2018, the Court stayed the transfer to allow the parties to fully brief the motion for reconsideration.

On February 22, 2018, Samsung filed a motion to stay pending arbitration. On May 11, 2018, Samsung filed a motion to dismiss for lack of standing. On June 29, 2018, Samsung filed a motion to stay pending determination of *inter partes* review of the patents-in-suit. The Court denied the motion on July 19, 2018.

In December 2018, the parties reached a global settlement and the Court dismissed the case. This matter is now concluded.

Tessera Advanced Technologies Inc. vs. Samsung (China) Investment Co., Ltd. et al. Case No. (2018) Jing Min Chu No. 12 (Beijing High Court, People's Republic of China)

On January 25, 2018, Tessera Advanced Technologies Inc. ("TATI") filed a complaint against Samsung (China) Investment Co., Ltd., Samsung Electronics Huizhou Co., Ltd. and Beijing Jiu Jiu Shun Fa Technologies Development Co., Ltd. (collectively the "Defendants") with the Beijing High Court, People's Republic of China. The complaint alleged that the Defendants infringe TATI's Chinese Patent No. 02155954.6. The complaint sought damages; an injunction prohibiting the Defendants from manufacturing, using, offering for sale, and selling infringing products in China; and orders requiring that the Defendants destroy infringing products and semi-finished products in their possession in China, as well as equipment, drawings and other objects and information used to manufacture infringing products.

On March 29, 2018, the Beijing High Court granted TATI's evidence preservation petition, and preserved from Samsung's Beijing offices certain financial documents related to its sale of allegedly infringing products. On April 4, 2018, Samsung (China) Investment Co., Ltd. filed a petition for reconsideration of the evidence preservation decision, which the Beijing High Court denied on April 10, 2018.

The Defendants filed petitions to challenge the jurisdiction of the Beijing High Court. On May 11, 2017, the Beijing High Court issued an order denying the Defendants' jurisdiction petitions. The Defendants appealed the order to the Supreme People's Court of the People's Republic of China ("PRC").

In December 2018, the parties reached a global settlement and TATI filed a petition to withdraw the case with the Beijing High Court. The case is currently pending a ruling from the Beijing High Court permitting the withdrawal.

Samsung Electronics Co., Ltd. v. Panasonic Corporation (f/k/a Matsushita Electric Industrial Co.), Ltd., Pannova Semic, LLC, and Tessera Advanced Technologies, Inc. (International Chamber of Commerce)

On May 18, 2018, Samsung Electronics Co., Ltd. ("Samsung") filed a Request for Arbitration against Tessera Advanced Technologies, Inc. ("Tessera"), Panasonic Corporation (f/k/a Matsushita Electric Industrial Co.) ("Panasonic") and Pannova Semic, LLC ("Pannova") with the International Chamber of Commerce. The Request sought declaratory judgments that Samsung has a license to practice U.S. Patent Nos. 6,954,001, 6,784,557, 6,512,298, and 6,852,616 ("Patents-in-Suit"); damages of at least $15 million for alleged breach of contract; and a declaratory judgment that Panasonic's assignment of the Patents-in-Suit is null and void. The Request further sought an order requiring reimbursement to Samsung of all expenses, including attorneys' fees, incurred in defending against lawsuits that Tessera or its affiliates filed in various jurisdictions. On June 25, 2018, Tessera and Pannova filed a Response to the Request for Arbitration, objecting to the jurisdiction of the Tribunal and denying the merits of Samsung's claims.

In December 2018, the parties reached a global settlement and jointly requested that the arbitration tribunal terminate the arbitration. On December 22, 2018, the tribunal confirmed termination of the arbitration. This matter is now concluded.

Patent Office Proceedings

CN Patent No. 02155954.6

On April 27, 2018, Samsung (China) Investment Co., Ltd. ("Samsung China") and Samsung Electronics Huizhou Co., Ltd. ("Samsung Huizhou") filed two invalidation petitions against CN Patent No. 02155954.6 (the "'954 patent") before the Patent Reexamination Board of State Intellectual Property Office of the PRC (the "PRB"). Both invalidation petitions requested a determination that claims 1-12 of '954 patent are unpatentable. Tessera Advanced Technologies, Inc. filed its response to the first invalidation case on July 19, 2018, and its response to the second invalidation case on July 29, 2018. The PRB held an oral hearing on November 16, 2018.

In December 2018, the parties reached a global settlement and Samsung China and Samsung Huizhou filed petitions to withdraw their invalidation petitions before the PRB. On December 20, 2018, the PRB issued a notification granting Samsung China and Samsung Huizhou's withdrawal of their invalidation petitions. These matters are now concluded.

U.S Patent No. 6,054,336

On June 15, 2018, Samsung Electronics Co., and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 6,054,336 (the "'336 patent") with the U.S. Patent and Trademark Office, Patent Trial and Appeal Board ("PTAB"). The petition requested a determination that claims 1-3 of the '336 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 4, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 6,232,231

On July 13, 2018, Samsung Electronics Co. Ltd., Samsung Electronics America, Inc., and Samsung Austin Semiconductor LLC filed a petition for *inter partes* review of U.S. Patent No. 6,232,231 (the "'231 patent") with the PTAB. The petition requested a determination that claims 1-16 of the '231 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 4, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 6,512,298

On June 15, 2018, Samsung Electronics Co. Ltd., and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 6,512,298 (the "'298 patent") with the PTAB. The petition requested a determination that claims 1-6 and 8-13 of the '298 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on December 18, 2018 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 6,566,167

On June 15, 2018, Samsung Electronics Co. Ltd., and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 6,566,167 (the "'167 patent") with the PTAB. The petition requested a determination that claims 1-12 of the '167 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 4, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 6,784,557

On January 11, 2018, Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Semiconductor, Inc. filed a petition for inter partes review of U.S. Patent No. 6,784,557 (the "'557 patent") with the PTAB. The petition requested a determination that claims 1-8 of the '557 patent are unpatentable. On July 19, 2018, the PTAB instituted an inter partes review of claims 1-8. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on February 4, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 6,825,554

On June 15, 2018, Samsung Electronics Co. Ltd., and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 6,825,554 (the "'554 patent") with the PTAB. The petition requested a determination that claims 1-5 of the '554 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 4, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 6,849,946

On July 13, 2018, Samsung Electronics Co. Ltd., Samsung Electronics America, Inc., and Samsung Austin Semiconductor LLC filed a petition for *inter partes* review of U.S. Patent No. 6,849,946 (the "'946 patent") with the PTAB. The petition requested a determination that claims 16-22 of the '946 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 4, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 6,852,616

On June 15, 2018, Samsung Electronics Co. Ltd., and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 6,852,616 (the "'616 patent") with the PTAB. The petition requested a determination that claims 1-6 and 8-9 of the '616 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on December 18, 2018 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 6,954,001

On March 16, 2018, Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Semiconductor, Inc. filed two petitions for *inter partes* review of U.S. Patent No. 6,954,001 (the "'001 patent") with the PTAB.

The first petition requested a determination that claims 1-18 of the '001 patent are unpatentable. On October 1, 2018, the PTAB granted the first petition and instituted an *inter partes* review of claims 1-18.

The second petition requested a determination that claims 1-4, 6-13, and 15-18 of the '001 patent are unpatentable. On October 1, 2018, the PTAB granted the second petition and instituted an *inter partes* review of claims 1-4, 6-13, and 15-18.

On December 13, 2018, the parties filed a joint motion to terminate the proceedings on the basis of settlement. The motion was granted on December 19, 2018 and the proceedings were dismissed. These matters are now concluded.

U.S. Patent No. 7,553,744

On October 1, 2018, Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 7,553,744 (the "'744 patent") with the PTAB. The petition requested a determination that claims 41, 44, and 45 of the '744 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on December 21, 2018 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 7,574,016

On September 27, 2018, Samsung Electronics Co. Ltd. filed a petition for *inter partes* review of U.S. Patent No. 7,574,016 (the "'016 patent") with the PTAB. The petition requested a determination that claims 1 and 2 of the '016 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 7,620,218

On October 3, 2018, Samsung Electronics Co., Ltd. filed a petition for *inter partes* review of U.S. Patent No. 7,620,218 (the "'218 patent") with the PTAB. The petition requested a determination that claims 1, 11, 14, 26, and 32 of the '218 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 7,697,829

On October 3, 2018, Samsung Electronics Co., Ltd. filed a petition for *inter partes* review of U.S. Patent No. 7,697,829 (the "'829 patent") with the PTAB. The petition requested a determination that claims 1, 7, 11, 14, and 15 of the '829 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on February 1, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 7,807,549

On October 1, 2018, Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. filed two petitions for *inter partes* review of U.S. Patent No. 7,807,549 (the "'549 patent") with the PTAB. The petitions requested a determination that claims 53, 60-63, 67-70, 74-77, 83-86, 89, and 92 of the '549 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceedings on the basis of settlement. The motion was granted on December 21, 2018 and the proceedings were dismissed. This matter is now concluded.

U.S Patent No. 7,860,274

On September 27, 2018, Samsung Electronics Co. Ltd. filed a petition for *inter partes* review of U.S. Patent No. 7,860,274 (the "'274 patent") with the PTAB. The petition requested a determination that claims 1, 5 and 9 of the '274 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 7,871,898

On October 1, 2018, Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 7,871,898 (the "'898 patent") with the PTAB. The petition requested a determination that claims 1-4, 9, 13-16, 21, 26, 32, and 37 of the '898 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on December 21, 2018 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 7,916,897

On October 3, 2018, Samsung Electronics Co., Ltd. filed a petition for *inter partes* review of U.S. Patent No. 7,916,897 (the "'897 patent") with the PTAB. The petition requested a determination that claims 1, 4, 5, and 14 of the '897 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 8,153,505

On October 2, 2018, Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. filed two petitions for *inter partes* review of U.S. Patent No. 8,153,505 (the "'505 patent") with the PTAB. The petitions requested a determination that claims 77, 79, 80–82, 84, 93–95, 99–101, 104–106, 110–114, 192, and 197 of the '505 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceedings on the basis of settlement. The motion was granted on December 21, 2018 and the proceedings were dismissed. This matter is now concluded.

U.S. Patent No. 8,254,674

On October 3, 2018, Samsung Electronics Co., Ltd. filed two petitions for *inter partes* review of U.S. Patent No. 8,254,674 (the "'674 patent") with the PTAB. The petitions requested a determination that claims 29, 35, 36, 40, 41, and 42 of the '674 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceedings on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 8,331,715

On September 27, 2018, Samsung Electronics Co. Ltd. filed a petition for *inter partes* review of U.S. Patent No. 8,331,715 (the "'715 patent") with the PTAB. The petition requested a determination that claims 1-4 and 6 of the '715 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S Patent No. 8,908,932

On September 27, 2018, Samsung Electronics Co. Ltd. filed two petitions for *inter partes* review of U.S. Patent No. 8,908,932 (the "'932 patent") with the PTAB. The petitions requested a determination that claims 7-9, 11-15, 17, and 18 of the '932 patent are unpatentable. On December 21, 2018, the parties filed a joint motion to terminate the proceedings on the basis of settlement. The motion was granted on January 22, 2019 and the proceeding was dismissed. This matter is now concluded.

U.S. Patent No. 9,391,143

On October 2, 2018, Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. filed two petitions for *inter partes* review of U.S. Patent No. 9,391,143 (the "'143 patent") with the PTAB. The petitions requested a determination that claims 1, 3-4, 6, 14-15, 20-22, 24, and 29-33 of the '143 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceedings on the basis of settlement. The motion was granted on December 21, 2018 and the proceedings were dismissed. This matter is now concluded.

U.S. Patent No. 9,431,368

On October 1, 2018, Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. filed a petition for *inter partes* review of U.S. Patent No. 9,431,368 (the "'368 patent") with the PTAB. The petition requested a determination that claims 1, 2, 4, 9-11, 13, 14, and 18 of the '368 patent are unpatentable. On December 13, 2018, the parties filed a joint motion to terminate the proceeding on the basis of settlement. The motion was granted on December 21, 2018 and the proceeding was dismissed. This matter is now concluded.

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

Since February 23, 2017, our common stock has traded publicly on The Nasdaq Global Select Market under the symbol "XPER." Prior to February 23, 2017, our common stock traded publicly on The Nasdaq Global Select Market under the symbol "TSRA". The price range per share is the highest and lowest bid prices, as reported by The Nasdaq Global Select Market, on any trading day during the respective quarter.

	High	Low
Fiscal Year Ended December 31, 2018		
First Quarter (ended March 31, 2018)	$ 24.90	$ 20.05
Second Quarter (ended June 30, 2018)	$ 23.50	$ 15.75
Third Quarter (ended September 30, 2018)	$ 17.45	$ 14.20
Fourth Quarter (ended December 31, 2018)	$ 18.74	$ 12.33

	High	Low
Fiscal Year Ended December 31, 2017		
First Quarter (ended March 31, 2017)	$ 45.80	$ 33.70
Second Quarter (ended June 30, 2017)	$ 34.25	$ 29.80
Third Quarter (ended September 30, 2017)	$ 33.70	$ 24.70
Fourth Quarter (ended December 31, 2017)	$ 27.60	$ 17.75

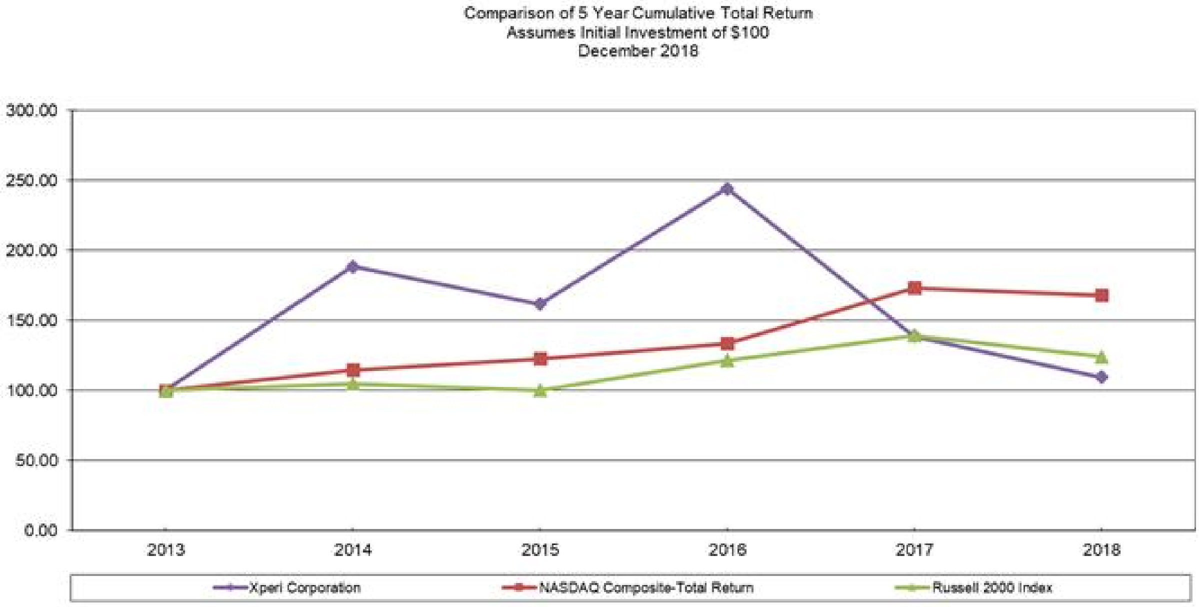
As of February 4, 2019, there were 48,652,499 outstanding shares of common stock held by 26 stockholders of record. In addition, a substantially greater number of stockholders may be "street name" or beneficial holders, whose shares are held of record by banks, brokers and other financial institutions.

In both 2018 and 2017, we paid quarterly dividends of $0.20 per share in each of March, June, September and December.

We also have historically returned capital to shareholders through stock repurchases. We anticipate that all quarterly dividends and stock repurchases will be paid out of cash, cash equivalents and short-term investments.

PERFORMANCE GRAPH

The following graph shows a comparison of total stockholder return for holders of our common stock, the Nasdaq Composite Index and the Russell 2000 Index from December 31, 2013 through December 31, 2018. The graph and table assume that $100 was invested on December 31, 2013 in each of our common stock, the Nasdaq Composite Index and the Russell 2000 Index, and that all dividends were reinvested. This graphic comparison is presented pursuant to the rules of the SEC.



	12/13	12/14	12/15	12/16	12/17	12/18
Xperi Corporation	$ 100.00	$ 188.59	$ 161.85	$ 244.38	$ 138.92	$ 109.58
Nasdaq Composite	$ 100.00	$ 114.75	$ 122.74	$ 133.62	$ 173.22	$ 168.30
Russell 2000 Index	$ 100.00	$ 104.89	$ 100.26	$ 121.63	$ 139.44	$ 124.09

This section is not “soliciting material,” is not deemed “filed” with the SEC and is not incorporated by reference in any filing of the Company under the Securities Act of 1933 or the Securities Exchange Act of 1934 (“Exchange Act”), whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

STOCK REPURCHASES

The following are our monthly stock repurchases for the fourth quarter of 2018, all of which were made as part of a publicly announced plan.

(Shares in thousands)	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of our share repurchase program	Approximate dollar value of shares that may yet be purchased under our share repurchase program (a)
2018				
October	251	$ 13.73	251	
November	54	13.85	54	
December	—	—	—	
Total	305	$ 13.75	305	$101.4 million

(a) Calculated as of December 31, 2018. In August 2007, our Board of Directors authorized a plan to repurchase our outstanding shares of common stock dependent on market conditions, share price and other factors. In January 2016, the Board authorized an additional $200.0 million in future repurchases under the plan. No expiration date has been specified for this plan. All repurchases in the three months ended December 31, 2018 were made under this plan.

Item 6. Selected Financial Data

The following selected consolidated financial data should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and the related notes appearing elsewhere in this Annual Report.

	Years Ended December 31,				
	2018	2017	2016 (1)	2015	2014
	(in thousands, except per share data)				
Consolidated statements of operations data					
Revenue	$ 406,133	$ 373,732	$ 259,565	$ 273,300	$ 278,807
Total operating expenses	$ 382,153	$ 405,232	$ 170,177	$ 111,098	$ 113,111
Operating income (loss)	$ 23,980	$ (31,500)	$ 89,388	$ 162,202	$ 165,696
Net income (loss)	$ (1,763)	$ (56,558)	$ 56,089	$ 117,016	$ 170,454
Net income (loss) attributable to Xperi (2)	$ (289)	$ (56,558)	$ 56,089	$ 117,016	$ 170,454
Income (loss) per share attributable to Xperi:					
Basic (3)	$ (0.01)	$ (1.15)	$ 1.14	$ 2.26	$ 3.23
Diluted (3)	$ (0.01)	$ (1.15)	$ 1.12	$ 2.23	$ 3.18
Cash dividends declared per share	$ 0.80	$ 0.80	$ 0.80	$ 0.80	$ 0.92
Weighted average number of shares used in per share calculation-basic (3)	48,823	49,251	49,187	51,802	52,819
Weighted average number of shares used in per share calculation-diluted (3)	48,823	49,251	50,190	52,586	53,563

	Years Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Consolidated statements of cash flows data:					
Net cash provided by operating activities (4)	$ 135,133	$ 147,265	$ 153,860	$ 147,276	$ 134,204

	December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Consolidated balance sheets data:					
Cash, cash equivalents and short-term investments	$ 154,364	$ 200,692	$ 113,005	$ 381,744	$ 434,421
Working capital	$ 343,378	$ 148,695	$ 148,924	$ 390,880	$ 441,484
Total assets	$ 1,235,107	$ 1,110,024	$ 1,186,436	$ 539,352	$ 577,123
Debt (5)	$ 494,000	$ 594,000	$ 600,000	$ —	$ —
Total Xperi stockholders' equity	$ 619,442	$ 435,576	$ 507,785	$ 515,157	$ 541,359

(1) Fiscal 2016 includes one month of financial results from DTS as well as one-time acquisition related expenses. All periods subsequent to 2016 include financial results from DTS post-acquisition.
(2) Excludes net income (loss) attributable to noncontrolling interest. See Note 1 of the Notes to Consolidated Financial Statements for further detail.
(3) See Note 11 of the Notes to Consolidated Financial Statements for an explanation of the methods used to determine the number of shares used to compute per share amounts.
(4) As a result of the adoption of ASU No. 2016-09, Compensation - Stock Compensation (Topic 718), we retrospectively adjusted our Consolidated Statements of Cash Flows to reclassify excess tax benefits of $8.2 million and $0.7 million from financing activities to operating activities in fiscal 2016 and 2015, respectively.
(5) Includes both the short-term and long-term portions of debt principal and excludes approximately $11.8 million, $14.3 million and $16.8 million in debt issuance costs as of December 31, 2018, 2017 and 2016, respectively.

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

The following discussion (presented in thousands, except for percentages) should be read in conjunction with our consolidated financial statements and notes thereto.

Business Overview

Xperi is a publicly-traded technology company with headquarters in Silicon Valley and operations around the world. Through its operating subsidiaries, Xperi creates, develops and licenses innovative audio, imaging, semiconductor packaging and interconnect technologies. We have approximately 700 employees and over 25 years of operating experience.

We license our innovative products, technologies and inventions to global electronics companies which, in turn, integrate the technologies into their own consumer electronics and semiconductor products. Our technologies and inventions are widely adopted and used every day by millions of people. Our audio technologies have shipped in billions of devices for the home, mobile and automotive markets. Our imaging technologies are embedded in more than 25% of the current smartphones. Our semiconductor packaging and interconnect technologies have been licensed to more than 100 customers and have shipped in over 100 billion semiconductor chips.

We completed the acquisition of DTS in December 2016. At the time of the acquisition, Tessera Technologies, Inc. and DTS were combined under the newly-formed Tessera Holding Corporation. During the first quarter of 2017, we introduced our new corporate name, Xperi Corporation, launched a new corporate logo, and began trading under a new stock symbol XPER.

Results of Operations

Significant events occurred over the past three years that affect the comparability of our financial statements. Key events and their financial impacts include the following:

- On December 10, 2018, we entered into an agreement with Samsung Electronics, Co., Ltd. ("Samsung") to settle and dismiss all pending litigation matters. In conjunction with the settlement, Samsung entered into a new patent license agreement with us. The settlement had a material impact on our financial results in 2018. Samsung was a significant customer in 2016 and before. The expiration of Samsung's license agreement at the end of 2016 had a material impact on our financial results in 2017.
- On December 18, 2017, we entered into agreements with Broadcom Ltd. and certain of its affiliates ("Broadcom"), customers, and suppliers to settle and dismiss all pending litigation matters. In conjunction with the settlement, Broadcom entered into a new multi-year patent license agreement with us. The settlement had a material impact on our financial results in 2017.
- On December 1, 2016, we completed our acquisition of DTS, Inc. ("DTS"). We incurred significant one-time expenses in the fourth quarter of 2016 related to this acquisition, including transaction costs (e.g. bankers fees, legal fees, consultant fees, etc.), severance costs and stock-based compensation expense resulting from the acceleration of equity instruments for departing executives. Additionally, our amortization expense increased significantly due to the acquired intangible assets resulting from the DTS acquisition.

Under generally accepted accounting principles regarding business combinations, we were unable to record $15.6 million and $51.6 million in revenue in the years ended December 31, 2018 and 2017, respectively, which would have been recognized by DTS under Topic 605 if not for the acquisition. If allowed, this revenue would have had a significant impact on the operating results as described below.

We adopted the new accounting standard, ASU No. 2014-09 (Topic 606) "Revenue from Contracts with Customers" effective January 1, 2018, which had a material impact on the financial reporting of our operating results as described below. We followed the modified retrospective transition method upon adoption, and under this method the comparative information for prior fiscal years has not been restated and continues to be reported under the accounting standards in effect for those periods. Refer to "Note 3 - *Recent Accounting Pronouncements*" and "Note 4 – *Revenue*" in the Notes to Consolidated Financial Statements for detailed information.

The adoption of Topic 606 does not impact customer billings or the cash flow from our contracts with customers. We expect to experience greater variability in quarterly and annual revenue as a result of Topic 606 being applied to minimum guarantee and fixed fee licensing contracts. We plan to place greater emphasis on billings and operating cash flows rather than revenue and net operating results to evaluate our financial performance in current and future periods.

Revenue

Our revenue is generated primarily from royalty and license fees. Revenue is recognized upon transfer of control of promised products, services or intellectual property and technologies ("IP") rights to customers in an amount that reflects the consideration that we expect to receive in exchange for those products, services or licensing of the IP rights.

Certain licensees have entered into fixed fee or minimum guarantee arrangements, whereby licensees pay a fixed fee for the right to incorporate our technology in the licensee's products over the license term. In arrangements with a minimum guarantee, the fixed fee component corresponds to a minimum number of units or dollars that the customer must produce or pay, with additional per-unit fees for any units or dollars exceeding the minimum. For these agreements, we recognize the full fixed fee amount as revenue at the beginning of the license term, when the licensee has the right to use the IP and begins to benefit from the license.

If the contract term of a fixed fee or minimum guarantee arrangement is longer than one year, we also consider the scheduled payment arrangements to determine whether a financing component exists. In general, if the payment arrangements extend beyond the initial twelve months of the contract, we treat a portion of the payments as a financing component. The discount rate used for each arrangement reflects the rate that would be used in a separate financing transaction between us and the licensee at contract inception, and takes into account the credit characteristics of the licensee and market interest rates as of the date of the agreement. As such, the amount of fixed fee revenue recognized at the beginning of the license term will be reduced by the calculated financing component. As payments are received from the licensee, we recognize a portion of the financing component through interest income.

For certain licensees, royalty revenue is generated based on a licensee's production or shipment of licensed products incorporating our IP, technologies or software. Licensees with a per-unit arrangement pay a per-unit royalty for each product manufactured or sold, as set forth in its license agreement. Licensees generally report manufacturing or sales information in the quarter subsequent to when such activity takes place. Under Topic 606, we estimate the royalties earned each quarter based on our forecast of manufacturing and sales activity incurred by our licensees in that quarter. Any differences between actual royalties owed by a licensee and our quarterly estimates are recognized in the following quarter, when the licensee's royalty report is received. Estimating licensees' quarterly royalties prior to receiving the royalty reports requires us to make significant assumptions and judgments that could have a material impact on the amount of revenue we report on a quarterly basis.

The timing of revenue recognition and the amount of revenue actually recognized for each type of revenue depends upon a variety of factors, including the specific terms of each arrangement, our ability to determine and allocate the transaction price to each separate performance obligation, and the nature of our deliverables and obligations. In addition, our royalty revenue will fluctuate based on a number of factors such as: (a) the rate of adoption and incorporation of our technology by licensees; (b) the demand for products incorporating semiconductors that use our licensed technology; (c) the cyclicality of supply and demand for products using our licensed technology; (d) volume incentive pricing terms in licensing agreements that may result in significant variability in quarterly revenue recognition from customers, and (e) the impact of economic downturns.

From time to time we enter into license agreements that have fixed expiration dates. Upon expiration of such agreements, we need to renew or replace these agreements in order to maintain our revenue base. We may not be able to continue licensing customers on terms favorable to us, under the existing terms or at all, which would in turn harm our results of operations.

In the past, we have engaged in litigation, arbitration proceedings, and royalty audits to directly or indirectly enforce our intellectual property rights and the terms of our license agreements, including proceedings to ensure proper and full payment of royalties by our current licensees and by third parties whose products incorporate our intellectual property rights.

The following table presents our historical operating results for the periods indicated as a percentage of revenue:

	Years ended December 31,		
	2018	2017	2016
Revenue:			
Royalty and license fees	100%	100%	100%
Total Revenue	100	100	100
Operating expenses:			
Cost of revenue	3	1	—
Research, development and other related costs	26	28	18
Selling, general and administrative	32	39	28
Amortization expense	27	30	12
Litigation expense	6	10	8
Total operating expenses	94	108	66
Operating income (loss) from continuing operations	6	(8)	34
Interest expense	(6)	(8)	(1)
Other income and expense, net	2	—	2
Income (loss) before taxes	2	(16)	35
Provision for (benefit from) income taxes	2	(1)	13
Net income (loss)	(0)%	(15)%	22%

Fiscal Year 2018 and 2017

The following table sets forth our revenue by year (in thousands, except for percentages):

	Years Ended December 31,		Increase/	%
	2018	2017	(Decrease)	Change
Royalty and license fees	$ 406,133	$ 373,732	$ 32,401	9%

The primary driver for the year-on-year changes in revenue was the purchase accounting impact on revenue of $51.6 million in fiscal 2017, amounts that would have been recognized as revenue by DTS under Topic 605 if not for the acquisition. Significantly offsetting the purchase accounting impact on 2017 was our inability to record billings as revenue in 2018 from minimum guarantee and fixed fee licensing contracts in place prior to the start of 2018 as a result of adopting Topic 606, which was partially offset by revenue recognized from the new patent license agreement with Samsung executed in the fourth quarter of 2018. Had we not implemented Topic 606, our revenue in 2018 under prior GAAP would have been $427.0 million. Refer to "Note 3 – *Recent Accounting Pronouncements*" in the Notes to Consolidated Financial Statements for further detail.

The following table sets forth our billings by year (in thousands, except for percentages):

	Years Ended December 31,		Increase/	%
	2018	2017	(Decrease)	Change
Total billings	$ 447,347	$ 422,476	$ 24,871	6%

The year-on-year changes in billings were primarily driven by higher billings from the aforementioned Samsung license agreement executed in December 2018, coupled with higher non-recurring engineering ("NRE") services revenue and licensing growth in the automotive and home markets, partially offset by lower billings from Broadcom (as a result of an upfront payment in 2017) and the expiration of a fixed fee licensing contract in the Semiconductor and IP segment in 2017.

With changes in revenue recognition due to the adoption of Topic 606 in 2018, we anticipate our revenue for 2019 will continue to be significantly impacted due principally to our inability to record future billings as revenue in 2019 and later periods from minimum guarantee and fixed fee licensing contracts in place prior to adoption of ASC 606 on January 1, 2018. This accounting change will not impact billings or the cash flow from these contracts. Furthermore, we may experience greater variability in quarterly and annual revenue in future periods as a result of the revenue accounting treatment applied to future minimum guarantee and fixed fee licensing contracts. Management plans to place greater emphasis on billings and cash flows, rather than revenue and net operating results, to internally evaluate our financial performance in future periods.

Cost of Revenue

Cost of revenue consists of royalties paid to third parties and direct compensation and related expenses to provide NRE services.

Cost of revenue for the year ended December 31, 2018 was $13.3 million, as compared to $6.3 million for the year ended December 31, 2017. The increase was due to higher costs on NRE contracts, which are generally reclassified from research and development as we satisfy the underlying performance obligations, as well as royalties recorded in connection with recently signed Product Licensing contracts. While the revenue and cost of revenue under these Product Licensing contracts is recorded when the contract becomes effective, the billings, cash inflows from customer payments, and cash outflows for royalty payments generally occur over several years.

Research, Development and Other Related Costs

Research and development is conducted primarily in-house and targets development of audio and image enhancement technologies, chip-scale, multi-chip and wafer level packaging, circuitry 3D-IC architectures, wafer and die bonding technologies and machine learning. Research, development and other related costs include expenses associated with applications engineering necessary to port and integrate our technologies and products on third party silicon and into end devices. These costs consist primarily of compensation and related costs for personnel, engineering consulting expenses associated with new product and technology development, product commercialization, quality assurance and testing costs, as well as costs related to patent applications and examinations, product “tear downs” and reverse engineering, materials, supplies and equipment depreciation. All research, development and other related costs are expensed as incurred.

Research, development and other related costs for the year ended December 31, 2018 were $106.4 million, as compared to $105.8 million for the year ended December 31, 2017, an increase of $0.6 million or 1%. The increase was primarily related to a $0.8 increase in equipment and materials expense and a $0.5 million increase in outside services, partially offset by R&D tax credits and development grants received in 2018.

We believe that a significant level of research and development expenses will be required for us to remain competitive in the future, and we expect total R&D expense will increase in 2019 as compared to 2018.

Selling, General and Administrative

Selling expenses consist primarily of compensation and related costs for sales and marketing personnel engaged in sales and licensee support, reverse engineering personnel and services, marketing programs, public relations, promotional materials, travel, trade show expenses and stock-based compensation expense. General and administrative expenses consist primarily of compensation and related costs for general management, information technology, finance personnel, legal fees and expenses, facilities costs, stock-based compensation expense and professional services. Our general and administrative expenses, other than facilities related expenses, are not allocated to other expense line items.

Selling, general and administrative expenses for the year ended December 31, 2018 were $127.9 million, as compared to $144.6 million for the year ended December 31, 2017, a decrease of $16.7 million or 12%. The decrease was due to a $6.1 million decrease in personnel related expenses, driven primarily by lower acquisition related severance and retention bonus expenses in 2018, a $3.7 million decrease in outside services which were associated with acquisition transaction costs in 2017, a $2.3 million decrease in stock-based compensation, and a $2.7 million decrease in legal and bad debt expense.

Amortization Expense

Amortization expense for the year ended December 31, 2018 was $108.5 million, as compared to $111.9 million for the year ended December 31, 2017, a decrease of $3.4 million. The decrease was primarily attributable to certain intangible assets becoming fully amortized over the past twelve months.

We anticipate that amortization expenses will continue to be a significant expense since we acquired approximately $479 million in intangible assets from the acquisition of DTS and other acquisition activity in 2016, which will be amortized over the next several years. See Note 9 – “*Goodwill and Identifiable Intangible Assets*” in Notes to Consolidated Financial Statements for additional information.

Litigation Expense

Litigation expense for the year ended December 31, 2018 was $26.1 million, as compared to $36.5 million for the year ended December 31, 2017, a decrease of $10.4 million. The decrease was primarily related to concluding litigation activity against Broadcom in December 2017, partially offset by increases in Samsung related litigation expenditures during 2018. In December 2018, we reached a settlement with Samsung which ended all related litigation.

We expect that litigation expense may continue to be a material portion of our operating expenses in future periods, and may fluctuate between periods, because of planned or ongoing litigation, as described in Part I, Item 3 – *Legal Proceedings*, and because of litigation planned for or initiated from time to time in the future in order to enforce and protect our intellectual property and contract rights.

Upon expiration of our customers' licenses, if those licenses are not renewed, litigation may become necessary to secure payment of reasonable royalties for the use of our patented technology. If we plan for or initiate such litigation, our future litigation expenses may increase.

Stock-based Compensation Expense

The following table sets forth our stock-based compensation expense for the years ended December 31, 2018 and 2017 (in thousands):

	Years Ended December 31,	
	2018	**2017**
Research, development and other related costs	$ 13,168	$ 13,277
Selling, general and administrative	17,843	20,185
Total stock-based compensation expense	$ 31,011	$ 33,462

Stock-based compensation awards include employee stock options, restricted stock awards and units, and employee stock purchases. For the year ended December 31, 2018, stock-based compensation expense was $31.0 million, of which $0.4 million related to employee stock options, $28.0 million related to restricted stock awards and units and $2.6 million related to employee stock purchases. For the year ended December 31, 2017, stock-based compensation expense was $33.5 million, of which $2.0 million related to employee stock options, $28.9 million related to restricted stock awards and units and $2.6 million related to employee stock purchases. The decrease in stock-based compensation expense in 2018 compared to 2017 was due primarily to the expenses recorded in 2017 relating to stock awards issued in connection with the DTS acquisition.

Interest Expense

Interest expense for the year ended December 31, 2018 was $25.7 million, as compared to $28.3 million for the year ended December 31, 2017. The decrease in interest expense in the year ended December 31, 2018 was primarily a result of lower debt principal as we made a $100.0 million pay-down in January 2018, partially offset by higher interest rates in 2018 due to the variable rate included in our debt. Consequently, interest expense may increase in future periods if market-based interest rates increase.

Other Income and Expense, Net

Other income and expense, net, for the year ended December 31, 2018 was $8.6 million, as compared to $1.4 million for the year ended December 31, 2017. Other income was higher in the current year principally due to interest income of $7.7 million earned from significant financing components on our fixed fee licensing contracts pursuant to Topic 606. As discussed above, we adopted Topic 606 in the first quarter of 2018.

Provision for (benefit from) Income Taxes

For the year ended December 31, 2018, we recorded an income tax expense of $8.7 million on pretax income of $6.9 million, which resulted in an effective tax rate of 125.5%. The income tax expense for the year ended December 31, 2018 was primarily related to foreign withholding taxes, certain non-deductible permanent differences, valuation allowance recorded against our unutilized tax credits, and shortfalls from stock-based compensation offset by tax benefit from the utilization of foreign tax credits and a deduction for foreign-derived income.

The income tax benefit of $1.8 million for the year ended December 31, 2017 is primarily related to losses generated from foreign operations, and tax benefit from the remeasurement of deferred taxes from the federal tax rate reduction, offset by tax expense from recording a valuation allowance against federal tax credits as a result of the Tax Act, foreign withholding taxes net of foreign tax credits, non-deductible stock-based compensation expense and other non-deductible expenses. The change from income tax benefit to income tax expense for the year ended December 31, 2018 as compared to the prior year is largely attributable to an increase in U.S. and foreign profitability for the current period and an increase in foreign withholding taxes.

On December 22, 2017, the Tax Act was signed into law. The Tax Act introduced a broad range of tax reform measures that significantly changed the federal income tax laws. As of December 31, 2017, we recorded a provisional tax expense in the Statement of Operations of approximately $5.6 million, comprised of approximately $13.5 million tax expense from recording additional valuation allowance against federal tax credits due to certain provisions of the Tax Act, offset by approximately $7.9 million of tax benefit from the remeasurement of U.S. deferred taxes using the 21% tax rate at which we expect the deferred amounts to reverse in the future. The one-time transition tax on post-1986 foreign unremitted earnings did not have a material impact on our effective tax rate. In accordance with Staff Accounting Bulletin (“SAB”) No. 118, we have completed our accounting related to tax reform in the fourth quarter of 2018 and no material adjustments to the provisional tax expense were required. We continue to monitor supplemental legislation and technical interpretations of the tax law that may cause the final impact from the Tax Act to differ from the amounts previously recorded.

Fiscal Year 2017 and 2016

The following table sets forth our revenue by year (in thousands, except for percentages):

	Years Ended December 31,		Increase/	%
	2017	**2016**	**(Decrease)**	**Change**
Royalty and license fees	$ 373,732	$ 259,565	$ 114,167	44%

The $114.2 million or 44% increase in revenue was due to our acquisition of DTS in December 2016, offset by a reduction in licensing revenue resulting from the expiration of our patent license agreement with Samsung. This reduction in licensing revenue was partially offset by revenue from the new patent license agreement with Broadcom in the fourth quarter of 2017. The majority of per-unit royalties reported by DTS licensees in the first quarter of 2017, which are associated with fourth quarter 2016 shipments by these licensees, as well as minimum guarantee fees from DTS licensees for contracts entered into prior to the December 1, 2016 acquisition, were not recorded as revenue in 2017, as under business combination accounting guidance the earnings process was deemed to have been completed prior to the acquisition.

Cost of Revenue

Cost of revenue for the year ended December 31, 2017 was $6.3 million, as compared to $0.6 million for the year ended December 31, 2016. The increase was a result of royalties paid to third parties in connection with audio revenue from the acquired DTS business.

Research, Development and Other Related Costs

Research, development and other related costs for the year ended December 31, 2017 were $105.8 million, as compared to $44.7 million for the year ended December 31, 2016, an increase of $61.1 million or 137%. The increase was primarily related to a $43.2 million increase in personnel related expenses, a $6.2 million increase in stock-based compensation and a $5.0 million increase in outside services. These increases are a direct result of adding over 230 engineers as part of the acquisition of DTS in December 2016.

Selling, General and Administrative

Selling, general and administrative expenses for the year ended December 31, 2017 were $144.6 million, as compared to $72.1 million for the year ended December 31, 2016, an increase of $72.5 million or 101%. The increase was primarily attributable to an increase of $42.2 million in personnel related expenses, a $2.1 million increase in outside services, a $6.2 million increase in stock-based compensation, a $3.8 million increase in travel and other expenses, a $4.6 million increase in depreciation and a $4.1 million increase in materials and supplies. These increases are a direct result of adding over 185 selling, general and administrative personnel as part of the acquisition of DTS in December 2016. Additionally, marketing expenses increased $8.0 million due primarily to greater participation in product marketing conferences, one-time expenses related to the branding of our new company name, and marketing initiatives and campaigns we undertook in 2017.

Amortization Expense

Amortization expense for the year ended December 31, 2017 was $111.9 million, as compared to $31.9 million for the year ended December 31, 2016, an increase of $80.0 million. This increase was primarily attributable to intangible assets recorded in connection with the DTS acquisition in the fourth quarter of 2016.

Litigation Expense

Litigation expense for the year ended December 31, 2017 was $36.5 million, as compared to $21.0 million for the year ended December 31, 2016, an increase of $15.5 million, or 74%. This increase was primarily related to our legal proceedings with Broadcom and our new proceedings filed against Samsung, as well as reflecting an offset to litigation expense of $5.0 million in 2016 due to an insurance settlement which refunded certain litigation costs incurred in prior years.

Stock-based Compensation Expense

The following table sets forth our stock-based compensation expense for the years ended December 31, 2017 and 2016 (in thousands):

	Years Ended December 31,	
	2017	**2016**
Research, development and other related costs	13,277	7,104
Selling, general and administrative	20,185	13,997
Total stock-based compensation expense	$ 33,462	$ 21,101

Stock-based compensation awards included employee stock options, restricted stock awards and units, and employee stock purchases. For the year ended December 31, 2017, stock-based compensation expense was $33.5 million, of which $2.0 million related to employee stock options, $28.9 million related to restricted stock awards and units and $2.6 million related to employee stock purchases. For the year ended December 31, 2016, stock-based compensation expense was $21.1 million, of which $3.3 million related to employee stock options, $17.0 million related to restricted stock awards and units and $0.8 million related to employee stock purchases. The increase in stock-based compensation expense in 2017 compared to 2016 primarily resulted from increased awards issued and headcount due to our acquisition of DTS.

Interest Expense

Interest expense for the year ended December 31, 2017 was $28.3 million, as compared to $2.4 million for the year ended December 31, 2016. We incurred a full year of interest expense in 2017 on the debt issued December 1, 2016 in connection with the acquisition of DTS, Inc.

Other Income and Expense, Net

Other income and expense, net, for the year ended December 31, 2017 was $1.4 million, as compared to $3.7 million for the year ended December 31, 2016. Other income was higher in 2016 due to interest income earned on higher cash and investment balances.

Provision for (benefit from) Income Taxes

The income tax benefit of $1.8 million for the year ended December 31, 2017 is primarily related to losses generated from foreign operations, and tax benefit from the remeasurement of deferred taxes from the federal tax rate reduction, offset by tax expense from recording a valuation allowance against federal tax credits as a result of the Tax Act, foreign withholding taxes net of foreign tax credits, non-deductible stock-based compensation expense and other non-deductible expenses.

The income tax expense of $34.6 million for the year ended December 31, 2016 was primarily related to tax liabilities generated from U.S. and foreign operations, non-deductible acquisition costs, non-deductible stock-based compensation expense and foreign withholding taxes net of foreign tax credits. The change from income tax expense to income tax benefit for the year ended December 31, 2017 as compared to the prior year is largely attributable to a decrease in U.S. and foreign profitability for the current period.

Segment Operating Results

We operate in two reportable segments: (1) Product Licensing and (2) Semiconductor and IP Licensing. There are certain corporate overhead costs that are not allocated to these reportable segments because these operating amounts are not considered in evaluating the operating performance of our business segments.

The Chief Executive Officer is also the Chief Operating Decision Maker ("CODM") as defined by the authoritative guidance on segment reporting.

The Product Licensing segment is comprised of our Audio and Imaging businesses, which we license through the DTS, FotoNation, HD Radio, and IMAX Enhanced brands. These licenses typically include the delivery of software and/or hardware-based solutions to our customers or to their suppliers. Product Licensing revenue is derived primarily from sales into the home, automotive and mobile markets.

The Semiconductor and IP Licensing segment includes our Tessera, Invensas and Invensas Bonding Technologies subsidiaries, which license semiconductor packaging and interconnect technologies and associated intellectual property. Semiconductor and IP Licensing revenue is derived from technology and IP licenses to semiconductor companies, foundries and packaging companies. We have a long history of developing and monetizing next-generation technologies, including chip-scale packaging solutions and low-temperature wafer bonding solutions. Today, we are actively developing and licensing 3D semiconductor packaging, interconnect and bonding solutions for semiconductors that are used in every day products such as smartphones, tablets, and laptops, as well as servers used in datacenters. We also provide engineering services to our customers to assist them in their evaluation and adoption of our technologies including the transition into high volume production.

We do not identify or allocate assets by reportable segment, nor does the CODM evaluate reportable segments using discrete asset information. Reportable segments do not record inter-segment revenue and accordingly there are none to report. Although the CODM uses operating income to evaluate reportable segments, operating costs included in one segment may benefit other segments.

The following table sets forth our segment revenue, operating expenses and operating income for the years ended December 31, 2018, 2017 and 2016 (in thousands):

	Years Ended December 31,		
	2018	2017	2016
Revenue:			
Product licensing segment	$ 219,708	$ 167,923	$ 30,499
Semiconductor and IP licensing segment	186,425	205,809	229,066
Total revenue	406,133	373,732	259,565
Operating expenses:			
Product licensing segment	180,727	172,745	25,299
Semiconductor and IP licensing segment	73,519	87,838	72,812
Unallocated operating expenses (1)	127,907	144,649	72,066
Total operating expenses	382,153	405,232	170,177
Operating income:			
Product licensing segment	38,981	(4,822)	5,200
Semiconductor and IP licensing segment	112,906	117,971	156,254
Unallocated operating expenses (1)	(127,907)	(144,649)	(72,066)
Total operating income (loss)	$ 23,980	$ (31,500)	$ 89,388

(1) Unallocated operating expenses consist primarily of selling, general and administrative expenses, such as administration, human resources, finance, information technology, corporate development and procurement. These expenses are not allocated because these amounts are not considered in evaluating the operating performance of our business segments.

For the year ended December 31, 2018, the unallocated expenses were $127.9 million compared to $144.6 million for the year ended December 31, 2017. The decrease of $16.7 million was primarily attributable to DTS acquisition-related transaction costs and severance and retention bonuses incurred in 2017, as well as a decrease in stock-based compensation and in legal and bad debt expenses in 2018. For the year ended December 31, 2017, the unallocated expenses were $144.6 million compared to $72.1 million for the year ended December 31, 2016. The increase of $72.5 million was primarily attributable to higher general and administrative personnel expenses that resulted from the acquisition of DTS.

The revenue and operating income amounts in this section have been presented on a basis consistent with GAAP applied at the segment level. Of our $385.8 million in goodwill at December 31, 2018, approximately $378.1 million is allocated to our Product Licensing segment and approximately $7.7 million is allocated to our Semiconductor and IP Licensing segment.

Product Licensing Segment

Fiscal Year 2018 and 2017

	Years Ended December 31,	
	2018	2017
	(in thousands)	
Revenue:		
Royalty and license fees	$ 219,708	$ 167,923
Total revenue	219,708	167,923
Operating expenses:		
Cost of revenues	13,291	6,308
Research, development and other related costs	78,892	75,809
Litigation	—	288
Amortization	88,544	90,340
Total operating expenses (1)	180,727	172,745
Total operating income (loss)	$ 38,981	$ (4,822)

(1) Excludes operating expenses which are not allocated on a segment basis.

Product Licensing revenue for the year ended December 31, 2018 was $219.7 million as compared to $167.9 million for the year ended December 31, 2017, an increase of $51.8 million. The primary driver for the year-on-year changes was the purchase accounting impact on revenue of $51.6 million in fiscal 2017, amounts that would have been recognized as revenue by DTS under Topic 605 if not for the acquisition. Additionally, new minimum guarantee contracts signed and higher NRE revenue recognized in fiscal 2018, as compared to the prior year, contributed to higher revenue in 2018.

The following table sets forth our billings by year (in thousands, except for percentages):

	Years Ended December 31,		Increase/	%
	2018	2017	(Decrease)	Change
Product licensing billings	$ 221,043	$ 215,822	$ 5,221	2%

The increase in billings in fiscal 2018, as compared to fiscal 2017, was primarily driven by higher NRE and licensing growth in the automotive and home markets, partially offset by a $3.8 million decrease in audit settlements in 2018.

Due to adoption of Topic 606, we anticipate Product Licensing revenue for 2019 will continue to be materially impacted due principally to our inability to record further billings as revenue in 2019 and later periods from minimum guarantee licensing contracts in place prior to the start of 2018. Further, we expect greater variability in quarterly and annual revenue in our Product Licensing segment in future periods as a result of the revenue accounting treatment applied to minimum guarantee and fixed fee licensing contracts.

Operating expenses for the year ended December 31, 2018 were $180.7 million and consisted of cost of revenue of $13.3 million, research, development and other related costs of $78.9 million and amortization costs of $88.5 million. The increase of $8.0 million in total operating expenses as compared to $172.7 million for the year ended December 31, 2017 was primarily driven by higher cost of revenue associated with increased NRE activity and royalties expense in connection with new audio revenue contracts, and higher R&D expense, which was partially offset by lower amortization. We expect R&D expense will continue to increase in this segment during 2019, and we expect a higher proportion of total R&D will occur in this segment.

Operating income for the year ended December 31, 2018 was $39.0 million compared to operating loss of $4.8 million for the year ended December 31, 2017, with the variance due to the reasons stated above.

Fiscal Year 2017 and 2016

	Years Ended December 31, 2017	2016
	(in thousands)	
Revenue:		
Royalty and license fees (1)	$ 167,923	$ 30,499
Total revenue	167,923	30,499
Operating expenses:		
Cost of revenues	6,308	551
Research, development and other related costs	75,809	16,091
Litigation	288	—
Amortization	90,340	8,657
Total operating expenses (2)	172,745	25,299
Total operating income (loss)	$ (4,822)	$ 5,200

(1) Includes $0.1 million for 2016, which is not part of current segment operations.
(2) Excludes operating expenses which are not allocated on a segment basis.

Under generally accepted accounting principles regarding business combinations, we were unable to record $51.6 million in revenue in the Product Licensing segment during the year ended December 31, 2017, which would have been recognized by DTS if not for the acquisition. If allowed, this revenue would have had a significant impact on the operating results as described below.

Product Licensing segment revenue for the year ended December 31, 2017 was $167.9 million as compared to $30.5 million for the year ended December 31, 2016, an increase of $137.4 million. The increase was due to revenue from licenses added through the DTS acquisition.

Operating expenses for the year ended December 31, 2017 were $172.7 million and consisted of cost of revenue of $6.3 million, research, development and other related costs of $75.8 million, litigation costs of $0.3 million and amortization costs of $90.3 million. The increase of $147.4 million in total operating expenses as compared to $25.3 million for the year ended December 31, 2016 was due to the acquisition of DTS. The increases were largely related to personnel-related costs including salary and benefits and stock-based compensation from the increased headcount, as well as an increase of $81.7 million in amortization due to the $479 million of intangible assets acquired in in the fourth quarter of 2016.

The operating loss in the year ended December 31, 2017 was $4.8 million compared to operating income of $5.2 million in the year ended December 31, 2016, due to the reasons stated above, in particular the amortization of intangible assets recorded in connection with the DTS acquisition, as well as the inability to record $51.6 million of revenue under purchase accounting guidance.

Semiconductor and IP Licensing Segment

Fiscal Year 2018 and 2017

	Years Ended December 31, 2018	2017
	(in thousands)	
Revenue:		
Royalty and license fees	$ 186,425	$ 205,809
Total revenue	186,425	205,809
Operating expenses:		
Research, development and other related costs	27,514	30,039
Litigation	26,099	36,209
Amortization	19,906	21,590
Total operating expenses (1)	73,519	87,838
Total operating income	$ 112,906	$ 117,971

(1) Excludes operating expenses which are not allocated on a segment basis.

Semiconductor and IP Licensing segment revenue for the year ended December 31, 2018 was $186.4 million as compared to $205.8 million for the year ended December 31, 2017, a decrease of $19.4 million. The decrease was primarily caused by our inability to record billings as revenue in 2018 from fixed fee licensing contracts in place prior to the start of 2018 as a result of adopting Topic 606, partially offset by revenue from the new patent license agreement with Samsung executed in the fourth quarter of 2018. Additionally, the expiration of a fixed fee contract in 2017 also contributed to the revenue decline in 2018.

The following table sets forth our billings by year (in thousands, except for percentages):

	Years Ended December 31,		Increase/	%
	2018	2017	(Decrease)	Change
Semiconductor and IP licensing billings	$ 226,304	$ 206,654	$ 19,650	10%

The increase in billings in fiscal 2018, as compared to fiscal 2017, was primarily driven by billings from the Samsung license agreement executed in December 2018, partially offset by lower billings from Broadcom (as a result of an upfront payment in 2017) and the expiration of a fixed fee contract in 2017.

Due to adoption of Topic 606, we anticipate Semiconductor and IP Licensing revenue for 2019 will continue to be significantly impacted due principally to our inability to record further billings as revenue in 2019 and later periods from minimum guarantee and fixed fee licensing contracts in place prior to the start of 2018. Further, we expect greater variability in quarterly and annual revenue in our Semiconductor and IP Licensing segment in future periods as a result of the revenue accounting treatment applied to minimum guarantee and fixed fee licensing contracts, which will necessitate recognizing revenue in the quarter a contract first becomes effective.

Operating expenses for the year ended December 31, 2018 were $73.5 million and consisted of research, development and other related costs of $27.5 million, litigation costs of $26.1 million, and amortization costs of $19.9 million. The decrease of $14.3 million in total operating expenses as compared to $87.8 million for the year ended December 31, 2017 resulted primarily from lower litigation costs as a result of concluding the legal proceedings against Broadcom in December 2017, as well as lower R&D expenses and amortization.

We expect that litigation expense will continue to be a material portion of the Semiconductor and IP Licensing segment's operating expenses in future periods, and may fluctuate significantly in some periods, because of our ongoing legal actions, as described in Part I, Item 3 - *Legal Proceedings*, and because we may become involved in other litigation from time to time in the future in order to enforce and protect our intellectual property and contract rights.

Operating income for the years ended December 31, 2018 and 2017 was $112.9 million and $118.0 million, respectively, which represented a decrease of $5.1 million, for the reasons stated above.

Fiscal Year 2017 and 2016

	Years Ended December 31,	
	2017	2016
	(in thousands)	
Revenue:		
Royalty and license fees	$ 205,809	$ 229,066
Total revenue	205,809	229,066
Operating expenses:		
Research, development and other related costs	30,039	28,647
Litigation	36,209	20,953
Amortization	21,590	23,212
Total operating expenses (1)	87,838	72,812
Total operating income	$ 117,971	$ 156,254

(1) Excludes operating expenses which are not allocated on a segment basis.

Semiconductor and IP Licensing segment revenue for the year ended December 31, 2017 was $205.8 million as compared to $229.1 million for the year ended December 31, 2016, a decrease of $23.3 million. The decrease was related to the expiration of our patent license agreement with Samsung, which was partially offset by revenue from the new patent license agreement with Broadcom in the fourth quarter of 2017. Upon adoption of ASC 606, we anticipate Semiconductor and IP Licensing revenue for 2018 will be significantly lower than that for 2017 due principally to our inability to record further billings as revenue in 2018 and later periods from minimum guarantee and fixed fees licensing contracts in place prior to the start of 2018. Further, we expect greater variability in quarterly and annual revenue in our Semiconductor and IP Licensing segment in future periods as a result of the revenue accounting treatment applied to future minimum guarantee and fixed fee licensing contracts, which will necessitate recognizing revenue in the quarter a contract first becomes effective.

Operating expenses for the year ended December 31, 2017 were $87.8 million and consisted of research, development and other related costs of $30.0 million, litigation costs of $36.2 million and amortization costs of $21.6 million. The increase of $15.0 million in total operating expenses as compared to $72.8 million for the year ended December 31, 2016, resulted primarily from higher litigation costs as a result of the legal proceedings against Broadcom and Samsung, and from decreased litigation costs in the third quarter of 2016 reflecting an insurance settlement payment of $5.0 million that we received in 2016.

Operating income for the years ended December 31, 2017 and 2016 were $118.0 million and $156.3 million, respectively, which represented a decrease of $38.3 million, for the reasons stated above.

Net Operating Losses and Tax Credit Carryforwards

As of December 31, 2018, we had federal net operating loss carryforwards of approximately $10.9 million and state net operating loss carryforwards of approximately $51.4 million. Substantially all of the federal net operating loss carryforwards are carried over from acquired entities, DTS in 2016 and Ziptronix in 2015. The state net operating loss carryforwards are carried over from acquired entities, DTS in 2016, Ziptronix in 2015, and Siimpel Corporation in 2010. The federal net operating loss carryforwards, if not utilized, will begin to expire on various dates beginning in 2026, and will continue to expire through 2031. The state net operating loss carryforwards, if not utilized, will begin to expire on various dates beginning in 2020, and will continue to expire through 2036. In addition, we have research tax credit carryforwards of approximately $9.7 million for federal purposes, a portion of which was generated in the current year and the remainder carried over from prior years. The federal research tax credit will start to expire in 2019 and will continue to expire through 2038. We also have research tax credit carryforwards of approximately $14.8 million for state purposes and $0.6 million for foreign purposes, which do not expire. We have $15.3 million of foreign tax credit carryforwards which will begin to expire in 2019 and will continue to expire through 2027. Under the provisions of the Internal Revenue Code, substantial ownership changes may limit the amount of net operating loss and tax credit carryforwards that can be utilized annually in the future to offset taxable income. In addition, for losses generated after December 31, 2017, the Tax Act modified the maximum deduction of net operating loss, eliminated carryback, and provided an indefinite carryforward.

The need for a valuation allowance requires an assessment of both positive and negative evidence when determining whether it is more-likely-than-not that deferred tax assets are recoverable; such assessment is required on a jurisdiction-by-jurisdiction basis. In making such assessment, significant weight is given to evidence that can be objectively verified. The new provisions in the Tax Act resulted in a valuation allowance recorded against our federal tax credits based on currently available information and interpretations.

Tax Effect from Stock Options

On January 1, 2017, we adopted Accounting Standards Update No. 2016-09 ("ASU 2016-09"), which requires any excess tax benefit or shortfalls to be recorded in the Consolidated Statement of Operations. The net tax benefit from our employee stock option plan as of December 31, 2018 was $2.6 million. The excess tax benefit from our employee stock option plan as of December 31, 2017 was $5.5 million.

Liquidity and Capital Resources

	December 31,		
(in thousands, except for percentages)	**2018**	**2017**	**2016**
Cash and cash equivalents	$ 113,625	$ 138,260	$ 65,626
Short-term investments	40,739	62,432	47,379
Total cash, cash equivalents and short-term investments	$ 154,364	$ 200,692	$ 113,005
Percentage of total assets	12%	18%	10%

	Years Ended December 31,		
	2018	2017	2016
Net cash from operating activities	$ 135,133	$ 147,265	$ 153,860
Net cash from investing activities	$ 11,432	$ (18,844)	$ (592,396)
Net cash from financing activities	$ (171,200)	$ (55,787)	$ 481,563

Our primary sources of liquidity and capital resources are our operating profits and our investment portfolio. Cash, cash equivalents and short-term investments were $154.4 million at December 31, 2018, a decrease of $46.3 million from $200.7 million at December 31, 2017. Cash and cash equivalents were $113.6 million at December 31, 2018, a decrease of $24.7 million from $138.3 million at December 31, 2017. These decreases resulted primarily from $100.0 million in voluntary pay-down of debt principal, $39.2 million in dividends paid and $44.8 million in repurchases of common stock. This decrease was partially offset by $135.1 million in cash from operations and by $13.2 million in proceeds from the exercise of stock options and employee stock purchases.

Cash flows provided by operations were $135.1 million for the year ended December 31, 2018, primarily due to the net loss of $1.8 million being adjusted for the non-cash items of depreciation of $6.7 million, amortization of intangible assets of $108.5 million, stock-based compensation expense of $31.0 million, and $2.7 million in amortization of total debt issuance costs. These increases were partially offset by a reduction of $15.6 million in deferred income taxes.

Cash flows provided by operations were $147.3 million for the year ended December 31, 2017, primarily due to our net loss of $56.6 million being adjusted for non-cash items of depreciation of $7.2 million, amortization of intangible assets of $111.9 million, stock-based compensation expense of $33.5 million and $65.7 million in changes in operating assets and liabilities. These increases were partially offset by $18.3 million in deferred income taxes.

Cash flows provided by operations were $12.1 million lower for 2018 as compared to 2017, in spite of an increase in billings of $24.9 million. The primary causes of the reduction in operating cash flows were a net unfavorable change in accounts payable and accruals of $26.2 million, which was primarily related to DTS acquisition retention bonuses of $18.0 million that were accrued in 2017 and subsequently paid in 2018, and a net unfavorable change in accounts receivable of $10.8 million for 2018 as compared to 2017. The net unfavorable receivable increase was due to higher billings issued near the end of December 2018 and certain delayed payments that are expected to be collected during the first quarter of 2019.

Cash flows provided by operations were $153.9 million for the year ended December 31, 2016, primarily due to our net income of $56.1 million being adjusted for non-cash items of amortization of intangible assets of $31.9 million, stock-based compensation expense of $21.1 million, and $30.6 million in changes in operating assets and liabilities.

Net cash provided by investing activities was $11.4 million for the year ended December 31, 2018, primarily related to maturities and sales of securities of $39.5 million, partially offset by purchases of securities of $20.1 million, purchases of intangible assets of $4.1 million and capital expenditures of $3.3 million.

Net cash used in investing activities was $18.8 million for the year ended December 31, 2017, primarily related to the purchases of available-for-sale securities of $33.1 million and $3.3 million in capital expenditures offset by maturities and sales of short-term investments of $17.5 million.

Net cash used in investing activities was $592.4 million for the year ended December 31, 2016, resulting from $888.2 million in net cash used to acquire DTS and $161.6 million in short-term investment purchases. These uses were partially offset by $470.8 million in the sales and maturities of short-term investments.

Net cash used in financing activities was $171.2 million for the year ended December 31, 2018 principally due to $100.0 million in voluntary pay-down of debt principal, $39.2 million in dividends paid and $44.8 million in repurchases of common stock, partially offset by $13.2 million in proceeds from the exercise of stock options and employee stock purchases stock purchase plans.

Net cash used in financing activities was $55.8 million for the year ended December 31, 2017 principally due to dividend payments of $39.5 million, $19.3 million in repurchases of common stock and $6.0 million in debt repayments, offset by $9.0 million in proceeds from the issuance of common stock under our employee stock option programs and employee stock purchase plans.

Net cash provided by financing activities was $481.6 million for the year ended December 31, 2016 due to $583.0 million in proceeds (net of debt issuance costs) from debt financing and $8.3 million in proceeds from the issuance of common stock under our employee stock option programs and employee stock purchase plans. These increases were partially offset by stock repurchases of $70.6 million and dividend payments of $39.2 million.

The primary objectives of our investment activities are to preserve principal and to maintain liquidity while at the same time capturing a market rate of return. To achieve these objectives, we maintain a diversified portfolio of debt securities including corporate bonds and notes, municipal bonds and notes, commercial paper, treasury and agency notes and bills, certificates of deposit and money market funds. We invest excess cash predominantly in high-quality investment grade debt securities with less than three years to maturity. Our marketable debt securities are classified as available-for-sale and are reported at fair value, with unrealized gains and losses, net of tax, recorded in accumulated other comprehensive income. The fair values for our securities are determined based on quoted market prices as of the valuation date and observable prices for similar assets. In the third quarter of 2018, we initiated an equity position in Onkyo Corporation, a publicly traded company listed on the JASDAQ market of the Tokyo Stock Exchange. Under Topic 321, we measure equity securities with readily determinable market value at fair value and recognize any changes in fair value in net income (loss). We recorded losses of approximately $2.2 million on this investment in 2018.

We evaluate our debt securities periodically for possible other-than-temporary impairment and review factors such as the length of time and extent to which fair value has been below cost basis, the financial condition of the issuer, and our ability and intent to hold the security until maturity on a more likely than not basis. If declines in the fair value of those investments are determined to be other-than-temporary, we report the credit loss portion of such decline in other income and expense, on a net basis, and the remaining noncredit loss portion in accumulated other comprehensive income. For the years ended December 31, 2018, 2017 and 2016, no impairment charges were recorded with respect to our investments in debt securities.

On December 1, 2016, we entered into a Credit Agreement which provided for a $600.0 million seven-year term B loan facility. The Term B Loan Facility matures on November 30, 2023. Upon the closing of the Credit Agreement, we borrowed $600.0 million under the Term B Loan facility. These proceeds were used on December 1, 2016, together with cash and cash equivalents, to finance the acquisition of DTS. The obligations under the Credit Agreement are guaranteed by substantially all of our assets pursuant to the Security Agreement, dated December 1, 2016, among us, Royal Bank of Canada, as collateral agent, and the other pledgors party thereto. On January 23, 2018, we completed a repricing of our debt, reducing the borrowing rate by 75 basis points, and paid down $100.0 million in principal balance.

At December 31, 2018, $494.0 million was outstanding under this loan facility with an interest rate, including amortization of debt issuance costs, of 5.1%. Interest is payable monthly. As the $100.0 million prepayment of debt principal we made in January 2018 exceeded the minimum principal payment requirements, we expect to have no further principal payment requirements until maturity of the loan, subject to our expected achievement of a net leverage ratio, as defined in the loan agreement, below 2.0 at the end of each fiscal year end. Because the interest rate on the loan facility is variable, we are subject to variations in our cash flows based on changes in market interest rate.

In August 2007, our Board of Directors (the “Board”) authorized a plan to repurchase our outstanding shares of common stock dependent on market conditions, share price and other factors. In January 2016, the Board authorized an additional $200 million in future repurchases under the plan, and as of December 31, 2018, the total amount available for repurchase under the plan was $101.4 million. No expiration has been specified for this plan. Since the inception of the plan, and through December 31, 2018, we have repurchased approximately 13.3 million shares of common stock at a total cost of $348.6 million at an average price of $26.25. We plan to continue to execute authorized repurchases from time to time under the plan.

In both 2018 and 2017, we paid quarterly dividends of $0.20 per share in each of March, June, September and December. In 2016, we paid quarterly dividends of $0.20 per share in each of March, June, September and November.

We believe that based on current levels of operations and anticipated growth, our cash from operations, together with cash, cash equivalents and short-term investments currently available, will be sufficient to fund our operations, debt service, dividends and stock repurchases and acquisition needs for at least the next twelve months. Poor financial results, unanticipated expenses, unanticipated acquisitions of technologies or businesses or unanticipated strategic investments could give rise to additional financing requirements sooner than we expect. There can be no assurance that equity or debt financing will be available when needed or, if available, that such financing will be on terms satisfactory to us and not dilutive to our then-current stockholders.

Contractual Cash Obligations

	Payments Due by Period				
	Total	Less than 1 Year	1-3 Years	4-5 Years	Thereafter
	(In thousands)				
Debt (1)	$ 494,000	$ —	$ —	$ 494,000	$ —
Operating lease obligations	$ 24,781	$ 6,341	$ 8,733	$ 6,189	$ 3,518

(1) Under our debt agreement, our debt bears a variable interest rate. See “Note 10 – *Debt*” for additional detail.

The amounts reflected in the table above for operating lease obligations represent aggregate future minimum lease payments under non-cancelable facility and equipment operating leases. For our facilities leases, rent expense charged to operations differs from rent paid because of scheduled rent increases. Rent expense is calculated by amortizing total rental payments on a straight-line basis over the lease term.

As of December 31, 2018, we had accrued $15.5 million of unrecognized tax benefits in long term income taxes payable related to uncertain tax positions and accrued approximately $0.9 million of interest. At this time, we are unable to reasonably estimate the timing of the long-term payments or the amount by which the liability will increase or decrease over time. As a result, this amount is not included in the table above.

Under certain contractual agreements, we may be obligated to pay up to approximately $7.7 million over an estimated period of approximately four years if certain milestones are achieved.

See “Note 15 – *Commitments and Contingencies*” of the Notes to Consolidated Financial Statements for additional detail.

Off-Balance Sheet Arrangements

As of December 31, 2018, we did not have any off-balance sheet arrangements as defined in item 303(a)(4)(ii) of Regulation S-K.

Critical Accounting Policies and Estimates

Management’s discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements. These financial statements have been prepared in conformity with generally accepted accounting principles (“GAAP”) in the United States which requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses, and related disclosure of contingent assets and liabilities. By their nature, these estimates and judgments are subject to an inherent degree of uncertainty. We evaluate our estimates based on our historical experience and various other assumptions that are believed to be reasonable under the circumstances. These estimates relate to revenue recognition, the assessment of recoverability of goodwill and intangible assets, the valuation and recognition of stock-based compensation expense, the valuation of investments, business combinations, recognition and measurement of deferred income tax assets and liabilities, the assessment of unrecognized tax benefits, and others. Actual results could differ from those estimates, and material effects on our operating results and financial position may result.

We believe the following accounting policies and estimates are most critical to the understanding of our consolidated financial statements. See “Note 2 - *Summary of Significant Accounting Policies*” and “Note 4 - *Revenue*” of the Notes to Consolidated Financial Statements for a full description of our accounting policies.

Revenue recognition

Our revenue is generated primarily from royalty and license fees. Revenue is recognized upon transfer of control of promised products, services or intellectual property and technologies (“IP”) rights to customers in an amount that reflects the consideration that we expect to receive in exchange for those products, services or licensing of the IP rights.

Certain licensees have entered into fixed fee or minimum guarantee arrangements, whereby licensees pay a fixed fee for the right to incorporate our technology in the licensee’s products over the license term. In arrangements with a minimum guarantee, the fixed fee component corresponds to a minimum number of units or dollars that the customer must produce or pay, with additional per-unit fees for any units or dollars exceeding the minimum. For both fixed fee and minimum guarantee agreements, we recognize the full fixed fee as revenue at the beginning of the license term, when the licensee has the right to use the IP and begins to benefit from the license.

If the contract term of a fixed fee or minimum guarantee arrangement is longer than one year, we also consider the scheduled payment arrangements to determine whether a financing component exists. In general, if the payment arrangements extend beyond the initial twelve months of the contract, we treat a portion of the payments as a financing component. The discount rate used for each arrangement reflects the rate that would be used in a separate financing transaction between us and the licensee at contract inception and takes into account the credit characteristics of the licensee and market interest rates as of the date of the agreement. As such, the amount of fixed fee revenue recognized at the beginning of the license term will be reduced by the calculated financing component. As payments are received from the licensee, we recognize a portion of the financing component through interest income.

For certain licensees, royalty revenue is generated based on a licensee's production or shipment of licensed products incorporating our IP, technologies or software. Licensees with a per-unit arrangement pay a per-unit royalty for each product manufactured or sold, as set forth in its license agreement. Licensees generally report manufacturing or sales information in the quarter subsequent to when such activity takes place. Under Topic 606, we estimate the royalties earned each quarter based on our forecast of manufacturing and sales activity incurred by our licensees in that quarter. Any differences between actual royalties owed by a licensee and our quarterly estimates are recognized in the following quarter, when the licensee's royalty report is received. Estimating licensees' quarterly royalties prior to receiving the royalty reports requires us to make significant assumptions and judgments that could have a material impact on the amount of revenue we report on a quarterly basis.

Valuation of goodwill and intangible assets

We make judgments about the recoverability of intangible assets whenever events or changes in circumstances indicate that impairment may exist. If such facts and circumstances exist, we assess recoverability by comparing the projected undiscounted net cash flows associated with the related asset or group of assets over their remaining lives against their respective carrying amounts. Impairments, if any, are based on the excess of the carrying amount over the fair value of those assets. If the useful life is shorter than originally estimated, we accelerate the rate of amortization and amortize the remaining carrying value over the new shorter useful life. Such changes could result in impairment charges or higher amortization expense in future periods, which could have a significant impact on our operating results and financial condition.

We perform an annual review of the valuation of goodwill in the fourth quarter, or more often if indicators of impairment exist. Triggering events for impairment reviews may be indicators such as adverse industry or economic trends, restructuring actions, lower projections of profitability, or a sustained decline in our market capitalization. Evaluations of possible impairment and, if applicable, adjustments to carrying values require us to estimate, among other factors, future cash flows, useful lives, and fair market values of our reporting units and assets. When we conduct our evaluation of goodwill, the fair value of goodwill is assessed using valuation techniques that require significant management estimates and judgment. Should conditions be different from management's last assessment, significant impairments of goodwill may be required, which would adversely affect our operating results.

Stock-based compensation expense

Calculating stock-based compensation expense requires the input of highly subjective assumptions, including the expected life of the options, stock price volatility, dividends and the pre-vesting option forfeiture rate. We estimate the expected life of options granted based on historical exercise patterns, which we believe are representative of future behavior. We estimate the volatility of our common stock on the date of grant based on our stock's market-based historical volatility. The assumptions used in calculating the fair value of stock-based awards represent our best estimates, but these estimates involve inherent uncertainties and the application of management judgment. As a result, if factors change and we use different assumptions, our stock-based compensation expense could be materially different in the future. In addition, we are required to estimate the expected forfeiture rate and only recognize expense for those shares expected to vest. We estimate the forfeiture rate based on historical experience of our stock-based awards that are granted, exercised and canceled. If our actual forfeiture rate is materially different from our estimate, stock-based compensation expense could be significantly different from what we have recorded in the current period. See "Note 13 - *Stock-Based Compensation Expense*" of the Notes to Consolidated Financial Statements for additional detail.

Valuation of investments

Our investments consist primarily of marketable debt securities (municipal bonds and notes, corporate bonds and notes, commercial paper, treasury and agency notes and bills and certificates of deposit and marketable equity securities (money market funds and common equities of publicly traded companies). We invest excess cash predominantly in high-quality investment grade marketable debt securities with less than three years to maturity.

Our marketable debt securities are classified as available-for-sale and are reported at fair value, with unrealized gains and losses, net of tax, recorded in accumulated other comprehensive income (loss). Realized gains and losses, unrealized losses and declines in value determined to be other-than-temporary, if any, on available-for-sale securities are generally reported in other income and expense, net. The fair values for our securities are determined based on quoted market prices as of the valuation date, observable prices for similar assets and, in the event that observable prices for similar assets are not available, externally provided pricing models, discounted cash flow methodologies or other similar techniques. The determination of fair value when quoted market prices are not available requires significant judgment and estimation. In addition, we evaluate the debt securities periodically for possible other-than-temporary impairment and review factors such as the length of time and extent to which fair value has been below cost basis, the financial condition of the issuer, our intent to hold, and whether we will not be required to sell the security before its anticipated recovery, on a more-likely-than-not basis. If any of these conditions and estimates change in the future, or, if different estimates are used, the fair value of the investments may change significantly and may result in other-than-temporary decline in value which could have an adverse impact on our results of operations.

Our equity securities are measured at fair value with unrealized gains and losses recognized in other income and expense, net, on the Consolidated Statement of Operations.

Business combinations

The fair value valuation of assets acquired and liabilities assumed in a business combination under ASC 805 requires management to make significant estimates and assumptions. Critical estimates in determining the fair value of certain intangible assets include, but are not limited to: future expected cash flows from customer contracts, customer lists, and acquired developed technologies and patents; expected costs to develop in-process research and development (IPR&D) into commercially viable products and estimating cash flows from projects when completed; brand awareness and market position, as well as assumptions about the period of time the brand will continue to be used in our product portfolio; and discount rates. For additional information, refer to "Note 8 -- *Business Combinations*" of the Notes to Consolidated Financial Statements.

Accounting for income taxes

We must make certain estimates and judgments in determining income tax expense for financial statement purposes. These estimates and judgments are used in the calculation of tax credits, tax benefits and deductions, and in the calculation of tax assets and liabilities. Significant changes to these estimates may result in an increase or decrease to our tax provision in a subsequent period.

We must assess the likelihood that we will be able to recover our deferred tax assets. If recovery is not likely on a more-likely-than-not basis, we must increase our provision for income taxes by recording a valuation allowance against our deferred tax assets. Should there be a change in our ability to recover our deferred tax assets, our provision for income taxes would fluctuate in the period of the change.

We account for uncertain tax positions in accordance with authoritative guidance related to income taxes. The calculation of our unrecognized tax benefits involves dealing with uncertainties in the application of complex tax regulations. As such, we are required to make many subjective assumptions and judgments regarding our income tax exposures. We record unrecognized tax benefits for anticipated tax audit issues in the U.S. and other tax jurisdictions based on our estimate of whether, and the extent to which, additional tax liabilities are more-likely-than-not assuming the tax authorities have full knowledge of all relevant information. If we ultimately determine that the tax liabilities are unnecessary, we reverse the liabilities and recognize a tax benefit during the period in which it occurs. This may occur for a variety of reasons, such as the expiration of the statute of limitations on a particular tax return or the completion of an examination by the relevant tax authority. We record an additional charge in our provision for taxes in the period in which we determine that the recorded unrecognized tax benefits are less than the expected ultimate settlement.

Our policy is to classify accrued interest and penalties related to the accrued liability for unrecognized tax benefits in the provision for income taxes. For the years ended December 31, 2018, 2017 and 2016, we did not recognize any significant penalties or interest related to unrecognized tax benefits. See "Note 14 - *Income Taxes*" of the Notes to Consolidated Financial Statements for additional detail.

Recent Accounting Pronouncements

See "Note 3 – *Recent Accounting Pronouncements*" of the Notes to Consolidated Financial Statements for a full description of recent accounting pronouncements including the respective expected dates of adoption.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

The primary objectives of our investment activities are to preserve principal and maintain liquidity while at the same time capturing a market rate of return. To achieve these objectives, we maintain our portfolio of cash, cash equivalents and investments in a variety of securities, which are subject to risks including:

Interest Rate Risk

Our interest rate risk relates primarily to interest expense on our debt and interest income from investments. As of December 31, 2018, a one percentage point change in interest rates on our debt throughout a one-year period would have an annual effect of approximately $5.0 million on our income before income taxes. Our interest income is sensitive to changes in the general level of US interest rates, particularly since a significant portion of our investments were, and may in the future be, in short-term marketable securities, U.S. government securities and corporate bonds. As of December 31, 2018, a one percentage point change in interest rates for our cash and investments throughout a one-year period would have an annual effect of approximately $1.5 million on our income before income taxes.

Investment Risk

We are exposed to market risk as it relates to changes in the market value of our investments in addition to the liquidity and credit worthiness of the underlying issuers of our investments. In the third quarter of 2018, we purchased equity of Onkyo Corporation, a publicly traded company listed on the JASDAQ market of the Tokyo Stock Exchange, which further subjects us to significant risks associated with individual securities. Our investments are subject to fluctuations in fair value due to the volatility of the credit markets and prevailing interest rates for such securities. Our marketable debt securities, consisting primarily of municipal bonds and notes, corporate bonds and notes, commercial paper, treasury and agency notes and bills and certificates of deposit, are classified as available-for-sale securities with fair values of $37.3 million and $62.4 million as of December 31, 2018 and 2017, respectively. Unrealized losses, net of tax, on these investments were approximately $0.3 million and $0.3 million as of December 31, 2018 and 2017, respectively. In addition, unrealized loss on the Onkyo equity investment, which was recognized in other income and expense, net, on our Consolidated Statement of Operations, amounted to $2.2 million in fiscal 2018. We do not hold any derivatives, derivative commodity instruments or other similar financial instruments in our portfolio.

Bank Liquidity Risk

As of December 31, 2018, we have approximately $102.1 million of cash in operating accounts that are held with both domestic and international financial institutions, the majority held with domestic financial institutions. These cash balances could be lost or become inaccessible if the underlying financial institutions fail or if they are unable to meet the liquidity requirements of their depositors and they are not supported by the federal government. We have not incurred any losses and have had full access to our operating accounts to date. We believe any failures of domestic and international financial institutions could impact our ability to fund our operations in the short term.

Exchange Rate Risk

During the year ended December 31, 2018, we derived approximately 87% of our revenue from sales outside the U.S. and we maintain research and development, sales, marketing, and business development offices in many foreign countries. Our results could be negatively affected by factors such as changes in foreign currency exchange rates, trade protection measures, longer accounts receivable collection patterns, and changes in regional or worldwide economic or political conditions. The risks from our international operations are mitigated in part by the extent to which our revenue is denominated in US dollars and, accordingly, we are not exposed to significant foreign currency risk on these items. Revenue denominated in foreign currencies was not material during 2018. On the other hand, we have a greater amount of foreign currency risk on certain operating expenses such as salaries and overhead costs of our foreign operations and cash maintained by these operations. In fiscal 2018, approximately $44.0 million operating expenses for our foreign subsidiaries were denominated in foreign currencies; as such a 10% fluctuation in exchange rates would impact our business by approximately $4.5 million.

Our international business is subject to risks, including, but not limited to, differing economic conditions, changes in political climate, differing tax structures, other regulations and restrictions, and foreign exchange rate volatility when compared to the U.S. dollar. Accordingly, our future results could be materially impacted by changes in these or other factors.

We are also affected by exchange rate fluctuations as the financial statements of our foreign subsidiaries are translated into U.S. dollars in consolidation. As exchange rates vary, these results, when translated, may vary from expectations and could adversely or positively impact overall profitability. During 2018, the impact of foreign exchange rate fluctuations related to translation of our foreign subsidiaries' financial statements was immaterial to our consolidated financial statements.

Item 8. Financial Statements and Supplementary Data

Our consolidated balance sheets as of December 31, 2018 and 2017, and the related consolidated statements of operations, equity, comprehensive income (loss) and cash flows for each of the years in the three-year period ended December 31, 2018 are set forth in this Annual Report at Item 15(a)(1).

SELECTED QUARTERLY FINANCIAL INFORMATION (UNAUDITED)

The following table presents our unaudited quarterly results of operations for the eight quarters in the periods ended December 31, 2018 and 2017.

The following table should be read in conjunction with the consolidated financial statements and related notes contained elsewhere in this Annual Report. We have prepared the unaudited information on the same basis as our audited consolidated financial statements. This table includes all adjustments, consisting only of normal recurring adjustments, that we consider necessary for fair statement of our financial position and operating results for the quarters presented. Operating results for any quarter are not necessarily indicative of results for any future quarters or for a full year. We employ a calendar month-end reporting period for our quarterly reporting.

	Three Months Ended (1)							
	Mar 31, 2017	Jun 30, 2017	Sep 30, 2017	Dec 31, 2017	Mar 31, 2018	Jun 30, 2018	Sep 30, 2018	Dec 31, 2018
	(in thousands, except per share amounts)							
Revenue:								
Royalty and license fees	$ 67,255	$ 91,322	$ 88,508	$ 126,647	$ 65,532	$ 63,954	$ 72,365	$ 204,282
Total Revenue	67,255	91,322	88,508	126,647	65,532	63,954	72,365	204,282
Operating expenses:								
Cost of revenue	1,400	1,303	1,667	1,938	2,324	2,080	5,003	3,884
Research, development and other related costs	26,012	26,313	25,840	27,684	26,515	25,170	24,189	30,532
Selling, general and administrative	41,205	33,003	33,995	36,446	34,702	30,476	28,084	34,645
Amortization expense	28,555	28,151	27,769	27,455	27,166	27,199	27,208	26,877
Litigation expense	9,978	8,226	9,163	9,129	7,316	6,635	7,642	4,506
Total operating expenses	107,150	96,996	98,434	102,652	98,023	91,560	92,126	100,444
Operating income (loss)	(39,895)	(5,674)	(9,926)	23,995	(32,491)	(27,606)	(19,761)	103,838
Interest expense	(6,459)	(7,046)	(7,371)	(7,416)	(6,318)	(6,200)	(6,343)	(6,804)
Other income and expense, net	46	220	739	444	3,154	2,229	1,737	1,475
Income (loss) before taxes	(46,308)	(12,500)	(16,558)	17,023	(35,655)	(31,577)	(24,367)	98,509
Provision for (benefit from) income taxes	(35,279)	26,557	(4,442)	11,379	(2,638)	(3,321)	(2,591)	17,223
Net income (loss)	$ (11,029)	$ (39,057)	$ (12,116)	$ 5,644	$ (33,017)	$ (28,256)	$ (21,776)	$ 81,286
Less: Net income (loss) attributable to noncontrolling interest	—	—	—	—	—	—	—	(1,474)
Net income (loss) attributable to Xperi	$ (11,029)	$ (39,057)	$ (12,116)	$ 5,644	$ (33,017)	$ (28,256)	$ (21,776)	$ 82,760
Income (loss) per share attributable to Xperi:								
Basic	$ (0.22)	$ (0.79)	$ (0.24)	$ 0.11	$ (0.67)	$ (0.58)	$ (0.44)	$ 1.71
Diluted	$ (0.22)	$ (0.79)	$ (0.24)	$ 0.11	$ (0.67)	$ (0.58)	$ (0.44)	$ 1.70
Cash dividends declared per share	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20
Weighted average number of shares used in per share calculations-basic	49,139	49,475	49,469	49,217	49,302	49,060	48,958	48,445
Weighted average number of shares used in per share calculations-diluted	49,139	49,475	49,469	49,638	49,302	49,060	48,958	48,559

(1) The sum of quarterly amounts, including per share amounts, may not equal amounts reported for year-to-date periods. This is due to the effects of rounding and changes in the number of weighted-average shares outstanding for each period.

Other Supplementary Data

The following tables present our quarterly unaudited non-GAAP financial measures for the eight quarters in the periods ended December 31, 2018 and 2017. The non-GAAP financial measures adjust for non-cash acquired intangibles, amortization charges, merger-related costs, all forms of stock-based compensation expense, restructuring, impairment of long-lived assets, interest income from significant financing components under Topic 606 and unrealized gains or losses on marketable equity securities. We believe that the non-GAAP measures used in this report provide investors with important perspectives into our ongoing business performance. Our management uses these non-GAAP financial measures when evaluating our operating performance. The non-GAAP financial measures disclosed by us should not be considered a substitute for, or superior to, financial measures calculated in accordance with GAAP, and the financial results calculated in accordance with GAAP and reconciliations to those financial statements should be carefully evaluated. The non-GAAP financial measures used by us may be calculated differently from, and therefore may not be comparable to, similarly titled measures used by other companies.

	Three Months Ended							
	Mar 31, 2017	Jun 30, 2017	Sep 30, 2017	Dec 31, 2017	Mar 31, 2018	Jun 30, 2018	Sep 30, 2018	Dec 31, 2018
	(in thousands)							
GAAP operating expenses	$ 107,150	$ 96,996	$ 98,434	$ 102,652	$ 98,023	$ 91,560	$ 92,126	$ 100,444
Adjustments to non-GAAP operating expenses:								
Stock-based compensation expense:								
Research, development and other related costs	(2,697)	(3,437)	(3,290)	(3,853)	(3,094)	(3,344)	(3,252)	(3,478)
Selling, general and administrative	(4,364)	(5,087)	(5,086)	(5,648)	(4,314)	(3,875)	(4,201)	(5,453)
Amortization of acquired intangibles	(28,555)	(28,151)	(27,769)	(27,455)	(27,166)	(27,199)	(27,208)	(26,877)
M&A transaction costs	(1,871)	34	—	—	—	—	—	—
Severance from DTS acquisition:								
Research, development and other related costs	(49)	(175)	—	(510)	—	—	—	—
Selling, general and administrative	(481)	193	—	(350)	—	—	—	—
Post acquisition retention bonus to DTS employees:								
Research, development and other related costs	(869)	(785)	(838)	(883)	(41)	(18)	—	—
Selling, general and administrative	(2,753)	(2,781)	(2,809)	(2,785)	(1,439)	(1,013)	—	—
Non-GAAP operating expenses	$ 65,511	$ 56,807	$ 58,642	$ 61,168	$ 61,969	$ 56,111	$ 57,465	$ 64,636

	Three Months Ended							
	Mar 31, 2017	Jun 30, 2017	Sep 30, 2017	Dec 31, 2017	Mar 31, 2018	Jun 30, 2018	Sep 30, 2018	Dec 31, 2018
	(in thousands)							
GAAP other income and expense, net	$ 46	$ 220	$ 739	$ 444	$ 3,154	$ 2,229	$ 1,737	$ 1,475
Adjustments to non-GAAP other income and expense, net:								
Interest income from significant financing components under Topic 606	—	—	—	—	(2,151)	(2,148)	(1,576)	(1,797)
Unrealized loss on marketable equity securities	—	—	—	—	—	—	566	1,651
Non-GAAP other income and expense, net	$ 46	$ 220	$ 739	$ 444	$ 1,003	$ 81	$ 727	$ 1,329

Additional Financial Data

The following table presents our total billings (in thousands):

	Three Months Ended							
	Mar 31, 2017	Jun 30, 2017	Sep 30, 2017	Dec 31, 2017	Mar 31, 2018	Jun 30, 2018	Sep 30, 2018	Dec 31, 2018
Total Billings	$ 99,672	$ 107,287	$ 85,308	$ 130,209	$ 104,268	$ 100,694	$ 100,587	$ 141,798

We define billings as amounts in an accounting period invoiced to customers, less any credits issued to or paid to customers, plus amounts due under certain licensing-related contractual arrangements that may not be subject to an invoice. Management evaluates the Company's financial performance in part based on billings due to the close alignment between billings and cash receipts from licensing activity, and believes billings is an important metric to provide to readers of our financial results. Billings may vary materially from revenue recorded under U.S. GAAP.

The following table presents our cash tax payments (in thousands):

	Three Months Ended							
	Mar 31, 2017	**Jun 30, 2017**	**Sep 30, 2017**	**Dec 31, 2017**	**Mar 31, 2018**	**Jun 30, 2018**	**Sep 30, 2018**	**Dec 31, 2018**
Cash Tax Payments	$ 3,040	$ 4,169	$ 4,405	$ 4,064	$ 3,963	$ 4,343	$ 4,462	$ 10,911

Cash tax payments are defined as total income taxes paid, net of refunds, and are derived from supplemental cash flow disclosure information appearing on the Consolidated Statements of Cash Flows.

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

Not applicable.

Item 9A. Controls and Procedures

Attached as exhibits to this Form 10-K are certifications of Xperi Corporation's Chief Executive Officer and Chief Financial Officer, which are required in accordance with Rules 13a-15(e) and 15d-15(e) of the Exchange Act. This "Controls and Procedures" section includes information concerning the controls and controls evaluation referred to in the certifications and it should be read in conjunction with the certifications, for a more complete understanding of the topics presented.

Evaluation of Controls and Procedures

Xperi Corporation maintains disclosure controls and procedures that are designed to ensure information required to be disclosed in our reports filed pursuant to the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act as of the end of the period covered by this report (the evaluation date). Based on this evaluation, our principal executive officer and principal financial officer concluded as of the evaluation date that our disclosure controls and procedures were effective to provide reasonable assurance that the information relating to Xperi Corporation, including our consolidated subsidiaries, required to be disclosed in our SEC reports (i) is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and (ii) is accumulated and communicated to Xperi Corporation's management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Change in Internal Control over Financial Reporting

There has been no change in Xperi Corporation's internal control over financial reporting, as defined in Exchange Act Rules 13a-15(f) and 15d-15(f), during Xperi Corporation's most recent quarter that has materially affected, or is reasonably likely to materially affect, Xperi Corporation's internal control over financial reporting.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting for Xperi Corporation. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles. Xperi Corporation's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of Xperi Corporation; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of Xperi Corporation are being made only in accordance with authorizations of management and directors of Xperi Corporation; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of Xperi Corporation's assets that could have a material effect on the financial statements.

Xperi Corporation's management assessed the effectiveness of our internal control over financial reporting as of December 31, 2018, utilizing the criteria set forth in 2013 by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework. Based on the assessment by Xperi Corporation's management, we determined that Xperi Corporation's internal control over financial reporting was effective as of December 31, 2018. The effectiveness of Xperi Corporation's internal control over financial reporting as of December 31, 2018 has been audited by PricewaterhouseCoopers LLP, Xperi Corporation's independent registered public accounting firm, as stated in their attestation report which appears on page F-1 of this Annual Report on Form 10-K.

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item 10 is hereby incorporated by reference from the information under the captions “Executive Officers,” “Election of Directors” and “Section 16(a) Beneficial Ownership Reporting Compliance” that will be contained in the Proxy Statement for our 2019 Annual Meeting of Stockholders (the “Proxy Statement”).

We have adopted a written code of business conduct and ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons serving similar functions. The text of our code of business conduct and ethics has been posted on our website at http://www.xperi.com. and is included as an exhibit to our Current Report on Form 8-K filed with the SEC on December 1, 2016.

Item 11. Executive Compensation

The information required by this Item 11 is incorporated by reference from the information under the captions “Election of Directors,” “Compensation Discussion and Analysis,” “Compensation of Named Executive Officers” and “Report of the Compensation Committee” that will be contained in the Proxy Statement.

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

The information required by this Item 12 is incorporated by reference from the information under the captions “Equity Compensation Plan Information” and “Security Ownership of Certain Beneficial Owners and Management” that will be contained in the Proxy Statement.

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

The information required by this Item 13 is incorporated by reference from the information under the captions “Certain Relationships and Related Transactions” and “Election of Directors” that will be contained in the Proxy Statement.

Item 14. Principal Accountant Fees and Services

The information required by this Item 14 is incorporated by reference from the information under the caption “Ratification of Independent Registered Public Accountants” that will be contained in the Proxy Statement.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Documents filed as part of this report:

The exhibits listed on the Exhibit Index preceding the signature page to this Annual Report are filed as part of this Annual Report.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Xperi Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Xperi Corporation and its subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of operations, comprehensive income (loss), equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2018 listed in the index appearing under Item 15(a)(2) (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above 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. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 3 to the consolidated financial statements, the Company changed the manner in which it accounts for revenues from contracts with customers in 2018.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting 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 in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements 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. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP

San Jose, California
February 20, 2019

We have served as the Company's auditor since 1999.

XPERI CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years Ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net income (loss)	$ (1,763)	$ (56,558)	$ 56,089
Adjustments to reconcile net income (loss) to net cash from operating activities:			
Depreciation of property and equipment	6,676	7,201	2,260
Amortization of intangible assets	108,450	111,930	31,870
Stock-based compensation expense	31,011	33,462	21,101
Deferred income tax	(15,578)	(18,294)	7,694
Amortization of debt issuance costs and other	2,688	3,046	4,273
Unrealized loss on marketable equity securities	2,217	—	—
Bad debt expense	417	2,404	—
Patents acquired through settlement agreements	—	(1,664)	—
Changes in operating assets and liabilities, net of business acquisitions:			
Accounts receivable	(14,381)	(3,551)	13,957
Unbilled contracts receivable, net	25,503	48,168	—
Other assets	(950)	3,458	18,067
Accounts payable	(1,469)	(3,298)	1,709
Accrued legal fees	(4,563)	(22)	4,884
Accrued and other liabilities	(4,352)	19,192	(1,573)
Deferred revenue	1,227	1,791	(6,471)
Net cash from operating activities	135,133	147,265	153,860
Cash flows from investing activities:			
Purchases of property and equipment	(3,338)	(3,323)	(3,794)
Proceeds from sale of property and equipment	—	235	—
Purchases of short-term investments	(20,095)	(33,102)	(161,595)
Proceeds from sales of short-term investments	8,540	1,035	299,524
Proceeds from maturities of short-term investments	30,925	16,487	171,255
Acquisition of business, net of cash acquired	(500)	—	(888,204)
Purchases of intangible assets	(4,100)	(176)	(9,582)
Net cash from investing activities	11,432	(18,844)	(592,396)
Cash flows from financing activities:			
Proceeds from debt, net	—	—	583,039
Repayment of debt	(100,000)	(6,000)	—
Contingent consideration payments after acquisition	(419)	—	—
Dividend paid	(39,187)	(39,509)	(39,158)
Proceeds from exercise of stock options	8,008	4,873	6,285
Proceeds from employee stock purchase program	5,196	4,132	1,998
Repurchases of common stock	(44,798)	(19,283)	(70,601)
Net cash from financing activities	(171,200)	(55,787)	481,563
Net increase (decrease) in cash and cash equivalents	(24,635)	72,634	43,027
Cash and cash equivalents at beginning of period	138,260	65,626	22,599
Cash and cash equivalents at end of period	$ 113,625	$ 138,260	$ 65,626
Supplemental disclosure of cash flow information:			
Interest paid	$ 23,134	$ 28,068	$ —
Income taxes paid, net of refunds	$ 23,679	$ 15,678	$ 7,676
Supplemental disclosure of non-cash investing activities:			
Fair value of unvested DTS equity awards assumed relating to pre-acquisition services	$ —	$ —	$ 13,124

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

XPERI CORPORATION
CONSOLIDATED BALANCE SHEETS
(in thousands, except for par value)

	December 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 113,625	$ 138,260
Short-term investments	40,739	62,432
Accounts receivable, net of allowance for doubtful accounts of $779 and $1,181, respectively	30,294	17,010
Unbilled contracts receivable	195,436	10,866
Other current assets	17,434	16,949
Total current assets	397,528	245,517
Long-term unbilled contracts receivable	86,280	2,930
Property and equipment, net	31,037	34,442
Intangible assets, net	327,720	431,789
Long-term deferred tax assets	3,677	5,156
Goodwill	385,784	385,574
Other assets	3,081	4,616
Total assets	$ 1,235,107	$ 1,110,024
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	$ 2,764	$ 4,233
Accrued legal fees	2,920	7,483
Accrued liabilities	45,336	47,969
Current portion of long-term debt	—	34,451
Deferred revenue	3,130	2,686
Total current liabilities	54,150	96,822
Long-term deferred tax liabilities	64,994	15,085
Long-term debt, net	482,193	545,211
Other long-term liabilities	15,623	17,330
Total liabilities	616,960	674,448
Commitments and contingencies (Note 15)		
Xperi stockholders' equity:		
Preferred stock: $0.001 par value; 10,000 shares authorized and no shares issued and outstanding	—	—
Common stock: $0.001 par value; 150,000 shares authorized; 62,212 and 60,608 shares issued, respectively, and 48,408 and 49,103 shares outstanding, respectively	62	60
Additional paid-in capital	730,695	686,660
Treasury stock at cost; 13,804 and 11,505 shares of common stock at each period end, respectively	(364,195)	(319,397)
Accumulated other comprehensive loss	(328)	(303)
Retained earnings	253,208	68,556
Total Xperi stockholders' equity	619,442	435,576
Noncontrolling interest	(1,295)	—
Total equity	618,147	435,576
Total liabilities and equity	$ 1,235,107	$ 1,110,024

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

XPERI CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share amounts)

	Years Ended December 31,		
	2018	2017	2016
Revenue:			
Royalty and license fees	$ 406,133	$ 373,732	$ 259,565
Total revenue	406,133	373,732	259,565
Operating expenses:			
Cost of revenue	13,291	6,308	551
Research, development and other related costs	106,406	105,849	44,738
Selling, general and administrative	127,907	144,649	72,065
Amortization expense	108,450	111,930	31,870
Litigation expense, net of settlement	26,099	36,496	20,953
Total operating expenses	382,153	405,232	170,177
Operating income (loss)	23,980	(31,500)	89,388
Interest expense	(25,665)	(28,292)	(2,409)
Other income and expense, net	8,595	1,449	3,736
Income (loss) before taxes	6,910	(58,343)	90,715
Provision for (benefit from) income taxes	8,673	(1,785)	34,626
Net income (loss)	$ (1,763)	$ (56,558)	$ 56,089
Less: Net income (loss) attributable to noncontrolling interest	(1,474)	—	—
Net income (loss) attributable to Xperi	$ (289)	$ (56,558)	$ 56,089
Income (loss) per share attributable to Xperi:			
Basic	$ (0.01)	$ (1.15)	$ 1.14
Diluted	$ (0.01)	$ (1.15)	$ 1.12
Cash dividends declared per share	$ 0.80	$ 0.80	$ 0.80
Weighted average number of shares used in per share calculations-basic	48,823	49,251	49,187
Weighted average number of shares used in per share calculations-diluted	48,823	49,251	50,190

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

XPERI CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(in thousands)

	Years Ended December 31,		
	2018	**2017**	**2016**
Net income (loss)	$ (1,763)	$ (56,558)	$ 56,089
Other comprehensive income (loss):			
Net unrealized gains (losses) on available-for-sale debt securities, net of tax	(25)	(155)	1,289
Other comprehensive income (loss)	(25)	(155)	1,289
Comprehensive income (loss)	(1,788)	(56,713)	57,378
Less: Comprehensive income (loss) attributable to noncontrolling interest	(1,474)	—	—
Comprehensive income (loss) attributable to Xperi	$ (314)	$ (56,713)	$ 57,378

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

XPERI CORPORATION
CONSOLIDATED STATEMENTS OF EQUITY
(in thousands)

	Total Xperi Stockholders' Equity								
	Common Stock		Additional Paid-In Capital	Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Noncontrolling Interest	Total Equity
	Shares	Amount		Shares	Amount				
Balance at December 31, 2015	50,294	$ 58	$ 599,186	8,398	$ (229,513)	$ (1,437)	$ 146,863	$ —	$ 515,157
Net income	—	—	—	—	—	—	56,089	—	56,089
Other comprehensive income	—	—	—	—	—	1,289	—	—	1,289
Cash dividends paid on common stock	—	—	—	—	—	—	(39,158)	—	(39,158)
Issuance of common stock in connection with exercise of stock options	350	—	6,285	—	—	—	—	—	6,285
Issuance of common stock in connection with employee common stock purchase plan	89	—	1,998	—	—	—	—	—	1,998
Issuance of restricted stock, net of shares canceled	465	1	—	—	—	—	—	—	1
Repurchases of common stock, shares exchanged	(91)	—	—	91	(2,900)	—	—	—	(2,900)
Repurchases of common stock	(2,253)	—	—	2,253	(67,701)	—	—	—	(67,701)
Stock-based compensation expense	—	—	21,101	—	—	—	—	—	21,101
Fair value of partially vested equity awards assumed in connection with the acquisition of DTS	—	—	13,124	—	—	—	—	—	13,124
Tax effect from employee stock option plan	—	—	2,500	—	—	—	—	—	2,500
Balance at December 31, 2016	48,854	$ 59	$ 644,194	10,742	$ (300,114)	$ (148)	$ 163,794	$ —	$ 507,785
Cumulative-effect adjustment from adoption of ASU 2016-09	—	—	—	—	—	—	829	—	829
Net loss	—	—	—	—	—	—	(56,558)	—	(56,558)
Other comprehensive loss	—	—	—	—	—	(155)	—	—	(155)
Cash dividends paid on common stock	—	—	—	—	—	—	(39,509)	—	(39,509)
Issuance of common stock in connection with exercise of stock options	180	—	4,872	—	—	—	—	—	4,872
Issuance of common stock in connection with employee common stock purchase plan	164	—	4,132	—	—	—	—	—	4,132
Issuance of restricted stock, net of shares canceled	668	1	—	—	—	—	—	—	1
Repurchases of common stock, shares exchanged	(109)	—	—	109	(3,944)	—	—	—	(3,944)
Repurchases of common stock	(654)	—	—	654	(15,339)	—	—	—	(15,339)
Stock-based compensation expense	—	—	33,462	—	—	—	—	—	33,462
Balance at December 31, 2017	49,103	$ 60	$ 686,660	11,505	$ (319,397)	$ (303)	$ 68,556	$ —	$ 435,576
Cumulative-effect adjustment from adoption of ASU 2014-09	—	—	—	—	—	—	224,128	—	224,128
Issuance of subsidiary shares to noncontrolling interest	—	—	(179)	—	—	—	—	179	—
Net loss	—	—	—	—	—	—	(289)	(1,474)	(1,763)
Other comprehensive loss	—	—	—	—	—	(25)	—	—	(25)
Cash dividends paid on common stock	—	—	—	—	—	—	(39,187)	—	(39,187)
Issuance of common stock in connection with exercise of stock options	427	1	8,007	—	—	—	—	—	8,008
Issuance of common stock in connection with employee common stock purchase plan	306	—	5,196	—	—	—	—	—	5,196
Issuance of restricted stock, net of shares canceled	871	1	—	—	—	—	—	—	1
Repurchases of common stock, shares exchanged	(162)	—	—	162	(3,429)	—	—	—	(3,429)
Repurchases of common stock	(2,137)	—	—	2,137	(41,369)	—	—	—	(41,369)
Stock-based compensation expense	—	—	31,011	—	—	—	—	—	31,011
Balance at December 31, 2018	48,408	$ 62	$ 730,695	13,804	$ (364,195)	$ (328)	$ 253,208	$ (1,295)	$ 618,147

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

NOTE 1 – THE COMPANY AND BASIS OF PRESENTATION

Xperi Corporation (the "Company") licenses its innovative products, technologies and inventions to global electronics companies which, in turn, integrate the technologies into their own consumer electronics and semiconductor products. The Company's technologies and inventions are widely adopted and used every day by millions of people. The Company's audio technologies have shipped in billions of devices for the home, mobile and automotive markets. The Company's imaging technologies are embedded in more than 25% of smartphones on the market today. The Company's semiconductor packaging and interconnect technologies have been licensed to more than 100 customers and have shipped in over 100 billion semiconductor chips.

The Company completed the acquisition of DTS, Inc. ("DTS"), a publicly-traded developer of sound-based technologies, in December 2016. At the time of the acquisition, Tessera Technologies, Inc. and DTS were combined under the newly-formed Tessera Holding Corporation. During the first quarter of 2017, the Company introduced its new corporate name, Xperi Corporation, launched a new corporate logo, and began trading under a new stock symbol XPER.

The consolidated financial statements include the accounts of Xperi Corporation, its wholly owned subsidiaries, and a majority-owned subsidiary. In the fourth quarter of fiscal 2018, the Company formed and funded a new research entity. The Company owns approximately 85% of the outstanding equity of this new entity and has consolidated the results of the entity in its consolidated financial statements beginning in the fourth quarter of fiscal 2018. The accompanying consolidated financial statements have been prepared in accordance with generally accepted accounting principles ("GAAP") in the United States ("U.S."). All significant intercompany balances and transactions are eliminated in consolidation.

The Company's fiscal year ends on December 31. The Company employs a calendar month-end reporting period for its quarterly reporting.

Reclassification

Certain reclassifications have been made to prior period balances in order to conform to the current period's presentation.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. The accounting estimates and assumptions that require management's most significant, difficult, and subjective judgment include the estimation of licensees' quarterly royalties prior to receiving the royalty reports, the collectability of accounts receivable, the fair value measurements of goodwill, other intangible assets and investments, the assessment of the recoverability of goodwill, the assessment of useful lives and recoverability of other intangible assets and long-lived assets, recognition and measurement of current and deferred income tax assets and liabilities, the assessment of unrecognized tax benefits and the valuation and recognition of stock-based compensation expense, and business combinations, among others. Actual results experienced by the Company may differ from management's estimates.

Cash and Cash Equivalents

The Company considers all highly liquid investments purchased with an original maturity of three months or less at the date of purchase to be cash equivalents. Cash and cash equivalents are maintained with various financial institutions.

Short-term Investments

The Company has investments in debt securities which include corporate bonds and notes, treasury and agency notes and bills, commercial paper, certificates of deposit, and in equity securities consisting of money market funds and common equity securities of publicly traded companies. The Company classifies all investments as current as the securities are available for use, if needed, for current operations.

Marketable Debt Securities

The Company classifies its debt securities as available-for-sale, which are accounted for at fair value with unrealized gains and losses recognized in accumulated other comprehensive income or loss, net of tax, on the Consolidated Balance Sheets. The Company evaluates its debt securities periodically for possible other-than-temporary impairment and reviews factors such as the length of time and extent to which fair value has been below cost basis, the financial condition of the issuer, and the Company's ability and intent to hold the security until maturity on a more-likely-than-not basis. If the declines in the fair value of the investments are determined to be other-than-temporary, the Company reports the credit loss portion of such decline in other income and expense, net, and the remaining noncredit loss portion in accumulated other comprehensive income. The cost of securities sold is based on the specific identification method. Interest and dividend income and realized gains or losses are included in other income and expense, net.

Marketable Equity Securities

On January 1, 2018, the Company adopted ASU 2016-01 (Topic 321) which requires equity securities to be measured at fair value with unrealized gains and losses recognized in other income and expense, net, on the Consolidated Statements of Operations.

Fair Value of Financial Instruments

The carrying amount of cash equivalents, accounts receivable, accounts payable and accrued liabilities approximates fair value due to the short-term nature of these instruments. Short-term and long-term debt are carried at historical cost and are measured at fair value on a quarterly basis for disclosure purposes. See "Note 7 – *Fair Value"* for further information.

Concentration of Credit and Other Risks

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist principally of cash equivalents, short-term investments and accounts receivable. The Company follows a corporate investment policy which sets credit, maturity and concentration limits and regularly monitors the composition, market risk and maturities of these investments. The Company believes that any concentration of credit risk in its accounts receivable is substantially mitigated by the Company's evaluation process, relatively short collection terms and the high level of credit worthiness of its customers. The Company performs ongoing credit evaluations of its customers' financial condition and limits the amount of credit extended when deemed necessary but generally requires no collateral.

At December 31, 2018, the Company had two customers representing 17% and 11% of aggregate trade receivables, respectively. At December 31, 2017, the Company had three customers representing 17%, 11% and 10% of aggregate trade receivables, respectively.

The following table sets forth revenue generated from customers which comprise 10% or more of total revenue for the periods indicated:

	Years Ended December 31,		
	2018	**2017**	**2016**
Samsung Electronics, Co. Ltd.	38%	*	25%
SK hynix Inc.	12%	*	12%
Micron Technology, Inc.	*	11%	17%
Amkor Technologies, Inc.	*	10%	15%

* denotes less than 10% of total revenue.

Allowance for Doubtful Accounts

The Company continually monitors customer payments and maintains a reserve for estimated losses resulting from its customers' inability to make required payments. In determining the reserve, the Company evaluates the collectibility of its accounts receivable based upon a variety of factors. In cases where the Company becomes aware of circumstances that may impair a specific customer's ability to meet its financial obligations, the Company records a specific allowance against amounts due. For all other customers, the Company recognizes allowances for doubtful accounts based on its historical write-off experience in conjunction with the length of time the receivables are past due, customer creditworthiness, geographic risk and the current business environment. Actual future losses from uncollectible accounts may differ from the Company's estimates. The allowance for doubtful accounts balance was $0.8 million and $1.2 million as of December 31, 2018 and December 31, 2017, respectively.

Goodwill and Identified Intangible Assets

Goodwill. Goodwill is recorded as the difference, if any, between the aggregate consideration paid for an acquisition and the fair value of the net tangible and identified intangible assets acquired under a business combination. Goodwill also includes acquired assembled workforce, which does not qualify as an identifiable intangible asset. The Company reviews impairment of goodwill annually in the fourth quarter, or more frequently if events or circumstances indicate that the goodwill might be impaired. The Company first assesses qualitative factors to determine whether it is necessary to perform the quantitative goodwill impairment test. If, after assessing the totality of events or circumstances, the Company determines that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, then the quantitative goodwill impairment test is unnecessary.

If, based on the qualitative assessment, it is determined that it is more likely than not that the fair value of a reporting unit is less than its carrying amount, then the Company proceeds to perform the quantitative goodwill impairment test. The Company first determines the fair value of a reporting unit using weighted results derived from an income approach and a market approach. The income approach is estimated through the discounted cash flow method based on assumptions about future conditions such as future revenue growth rates, new product and technology introductions, gross margins, operating expenses, discount rates, future economic and market conditions, and other assumptions. The market approach estimates the fair value of the Company's equity by utilizing the market comparable method which is based on revenue multiples from comparable companies in similar lines of business. The Company then compares the derived fair value of a reporting unit with its carrying amount. If the carrying value of a reporting unit exceeds 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.

Identified intangible assets. Identified finite-lived intangible assets consist of acquired patents, existing technology, customer relationships, trademarks and trade names, non-compete agreements resulting from business combinations, and acquired patents under asset purchase agreements. The Company's identified intangible assets are amortized on a straight-line basis over their estimated useful lives, ranging from 1 to 15 years. The Company makes judgments about the recoverability of finite-lived intangible assets whenever facts and circumstances indicate that the useful life is shorter than originally estimated or that the carrying amount of assets may not be recoverable. If such facts and circumstances exist, the Company assesses recoverability by comparing the projected undiscounted net cash flows associated with the related asset or group of assets over their remaining lives against their respective carrying amounts. Impairments, if any, are based on the excess of the carrying amount over the fair value of those assets. If the useful life is shorter than originally estimated, the Company would accelerate the rate of amortization and amortize the remaining carrying value over the new shorter useful life.

Identified indefinite-lived intangible assets include in-process research and development (IPR&D) resulting from business combinations. The Company evaluates the carrying value of indefinite-lived intangible assets on an annual basis, and an impairment charge would be recognized to the extent that the carrying amount of such assets exceeds their estimated fair value.

For further discussion of goodwill and identified intangible assets, see "Note 9 – *Goodwill and Identified Intangible Assets*."

Debt Issuance Costs

Debt issuance costs are presented in the consolidated balance sheet as a deduction from the carrying amount of the long-term debt, and are amortized over the term of the associated debt to interest expense using the effective interest method. In addition, the Company elects to continue to defer the unamortized debt issuance costs when it pays down a portion of the debt as the prepayment is factored into the terms agreed to on the debt.

Treasury Stock

The Company accounts for stock repurchases using the cost method. For reissuance of treasury stock, to the extent that the reissuance price is more than the cost, the excess is recorded as an increase to capital in excess of par value. If the reissuance price is less than the cost, the difference is recorded in capital in excess of par value to the extent there is a cumulative treasury stock paid-in capital balance. Once the cumulative balance is reduced to zero, any remaining difference resulting from the sale of treasury stock below cost is recorded as a reduction of retained earnings.

Business Combinations

The Company includes the results of operations of the businesses that it has acquired in its consolidated results as of the respective dates of acquisition.

The Company allocates the fair value of the purchase consideration of its acquisitions to the tangible assets, liabilities and intangible assets acquired, including IPR&D, based on their estimated fair values. The excess of the fair value of purchase consideration over the fair values of these identifiable assets and liabilities is recorded as goodwill. The primary items that generate goodwill include the value of the synergies between the acquired companies and the Company and the acquired assembled workforce, neither of which qualifies as an identifiable intangible asset. IPR&D is initially capitalized at fair value as an intangible asset with an indefinite life and assessed for impairment thereafter. When the IPR&D project is complete, it is reclassified as an amortizable intangible asset and is amortized over its estimated useful life. If an IPR&D project is abandoned, the Company records a charge for the value of the related intangible asset in its consolidated statement of operations in the period it is abandoned. The fair value of contingent consideration associated with acquisitions is remeasured each reporting period and adjusted accordingly. Acquisition and integration related costs are recognized separately from the business combination and are expensed as incurred.

For additional information regarding the Company's acquisitions, refer to “Note 8 – *Business Combinations.”*

Revenue Recognition

The Company derives its revenue primarily from royalty and license fees for rights to use the Company’s intellectual property and technologies (“IP”). Revenue is recognized upon transfer of control of promised products, services or IP rights to customers in an amount that reflects the consideration the Company expects to receive in exchange for those products, services or licensing of the IP rights. See “Note 4 – *Revenue”* for a detailed discussion on revenue and revenue recognition.

Indemnification

The Company provides indemnification of varying scope to certain customers against claims of intellectual property infringement made by third parties arising from the use of the Company’s technologies. In accordance with authoritative guidance for accounting for guarantees, the Company evaluates estimated losses for such indemnification. The Company considers such factors as the degree of probability of an unfavorable outcome and the ability to make a reasonable estimate of the amount of loss. To date, no such claims have been filed against the Company and no liability has been recorded in the Company’s financial statements.

As permitted under Delaware law, the Company has agreements whereby it indemnifies its officers and directors for certain events or occurrences while the officer or director is, or was, serving at the Company’s request in such capacity. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is unlimited; however, the Company believes, given the absence of any such payments in the Company’s history, and the estimated low probability of such payments in the future, that the estimated fair value of these indemnification agreements is immaterial. In addition, the Company has directors’ and officers’ liability insurance coverage that is intended to reduce its financial exposure and may enable the Company to recover any payments, should they occur.

Research, Development and Other Related Costs

Research and development is conducted primarily in-house and targets development of audio and image enhancement technologies, chip-scale and multi-chip packaging, circuitry design, 3D-IC architectures, wafer-level packaging technology, bonding technologies and machine learning. Research, development and other related costs include expenses associated with applications engineering necessary to port and integrate the Company’s technologies and products on third party silicon and into end devices. These costs consist primarily of compensation and related costs for personnel, engineering consulting expenses associated with new product and technology development, product commercialization, quality assurance and testing costs, as well as costs related to patent applications and examinations, product “tear downs” and reverse engineering, materials, supplies and equipment depreciation. All research, development and other related costs are expensed as incurred.

Stock-based Compensation Expense

The Company accounts for stock-based compensation expense in accordance with the authoritative guidance on share-based payments. Under the provisions of the guidance, stock-based compensation expense is measured at the grant date based on the fair value of the option using a Black-Scholes option pricing model and is recognized as expense on a straight-line basis over the requisite service period, which is generally the vesting period. The fair value of the Company's stock awards for non-employees is estimated based on the fair market value on each vesting date, accounted for under the variable-accounting method.

The authoritative guidance also requires that the Company measure and recognize stock-based compensation expense upon modification of the term of stock award. The stock-based compensation expense for such modification is the sum of any unamortized expense of the award before modification and the modification expense. The modification expense is the incremental amount of the fair value of the award before the modification and the fair value of the award after the modification, measured on the date of modification. In the case when the modification results in a longer requisite period than in the original award, the Company has elected to apply the pool method where the aggregate of the unamortized expense and the modification expense is amortized over the new requisite period on a straight-line basis. In addition, any forfeiture will be based on the original requisite period prior to the modification.

Calculating stock-based compensation expense requires the input of highly subjective assumptions, including the expected term of the stock-based awards, stock price volatility, and the pre-vesting option forfeiture rate. The Company estimates the expected life of options granted based on historical exercise patterns, which are believed to be representative of future behavior. The Company estimates the volatility of the Company's common stock on the date of grant based on historical volatility. The assumptions used in calculating the fair value of stock-based awards represent the Company's best estimates, but these estimates involve inherent uncertainties and the application of management judgment. As a result, if factors change and the Company uses different assumptions, its stock-based compensation expense could be materially different in the future. In addition, the Company is required to estimate the expected forfeiture rate and only recognize expense for those shares expected to vest. The Company estimates the forfeiture rate based on historical experience of its stock-based awards that are granted, exercised and cancelled. If the actual forfeiture rate is materially different from the estimate, stock-based compensation expense could be significantly different from what was recorded in the current period. The Company also grants performance share units (PSUs) to employees or consultants. PSU awards will vest if certain employee-specific or company-designated performance targets are achieved. If minimum performance thresholds are achieved, each PSU award will convert into Xperi common stock at a defined ratio depending on the degree of achievement of the performance target designated by each individual award. If minimum performance thresholds are not achieved, then no shares will be issued. Based upon the expected levels of achievement, stock-based compensation is recognized on a straight-line basis over the PSUs' requisite service periods. The expected levels of achievement are reassessed over the requisite service periods and, to the extent that the expected levels of achievement change, stock-based compensation is adjusted in the period of change and recorded on the statements of operations and the remaining unrecognized stock-based compensation is recorded over the remaining requisite service period. See "Note 13 – *Stock-based Compensation Expense"* for additional detail.

Income Taxes

The Company must make certain estimates and judgments in determining income tax expense for financial statement purposes. These estimates and judgments are used in the calculation of tax credits, tax benefits, tax deductions, and in the calculation of certain deferred taxes and tax liabilities. Significant changes to these estimates may result in an increase or decrease to the Company's tax provision in a subsequent period.

The provision for income taxes was comprised of the Company's current tax liability and changes in deferred income tax assets and liabilities. The calculation of the current tax liability involves dealing with uncertainties in the application of complex tax laws and regulations and in determining the liability for tax positions, if any, taken on the Company's tax returns in accordance with authoritative guidance on accounting for uncertainty in income taxes. Deferred income taxes are determined based on the differences between the financial reporting and tax basis of assets and liabilities. The Company must assess the likelihood that it will be able to recover the Company's deferred tax assets. If recovery is not likely on a more-likely-than-not basis, the Company must increase its provision for income taxes by recording a valuation allowance against the deferred tax assets that it estimates will not ultimately be recoverable. However, should there be a change in the Company's ability to recover its deferred tax assets, the provision for income taxes would fluctuate in the period of such change. See "Note 14 – *Income Taxes"* for additional detail.

Contingencies

From time to time, the Company may be involved in legal and administrative proceedings and claims of various types. The Company records a liability in its consolidated financial statements for these matters when a loss is known or considered probable and the amount can be reasonably estimated. Management reviews these estimates in each accounting period as additional information becomes known and adjusts the loss provision when appropriate. If the loss is not probable or cannot be reasonably estimated, a liability is not recorded in the consolidated financial statements. If a loss is probable but the amount of loss cannot be reasonably estimated, the Company discloses the loss contingency and an estimate of possible loss or range of loss (unless such an estimate cannot be made). The Company does not recognize gain contingencies until they are realized. Legal costs incurred in connection with loss contingencies are expensed as incurred. See "Note 15 – *Commitments and Contingencies*," for further information regarding the Company's pending litigation.

Property and Equipment

Property and equipment are recorded at cost, less accumulated depreciation. Depreciation is calculated using the straight-line method over the related assets' estimated useful lives:

Equipment, furniture and other	1 to 5 years
Leasehold improvements	Lesser of related lease term or 5 years
Building and improvements	Up to 30 years

Expenditures that materially increase asset life are capitalized, while ordinary maintenance and repairs are expensed as incurred.

Foreign Currency Translation

The functional currency of substantially all of the Company's subsidiaries is the U.S. dollar. Certain subsidiaries have monetary assets and liabilities that are denominated in a currency that is different than the functional currency. The gains and losses resulting from this remeasurement and translation of monetary assets denominated in a currency that is different than the functional currency are reflected in the determination of net income (loss).

NOTE 3 – RECENT ACCOUNTING PRONOUNCEMENTS

Recently Adopted Accounting Pronouncements

In January 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-01, "*Financial Instruments—Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities"* (ASU 2016-01), which addresses certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. The amended guidance requires certain equity investments that are not consolidated and not accounted for under the equity method to be measured at fair value with changes in fair value recognized in net income. The Company adopted ASU 2016-01 on January 1, 2018 using the modified retrospective method, which did not have an impact on its consolidated financial statements as there were no unrealized gains or losses associated with marketable equity securities on the adoption date. Following the adoption of the standard, unrealized gains and losses on equity securities are recorded in other income and expense, net, on the Consolidated Statements of Operations. See "Note 6 – *Financial Instruments*" for further information.

In August 2016, the FASB issued ASU No. 2016-15, "*Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments*." This ASU addresses the classification of certain specific cash flow issues including debt prepayment or extinguishment costs, settlement of certain debt instruments, contingent consideration payments made after a business combination, proceeds from the settlement of certain insurance claims and distributions received from equity method investees. This ASU is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years, with early adoption permitted. The Company adopted this standard as of January 1, 2018. The adoption of this standard did not have a material impact on the Company's consolidated financial statements.

In October 2016, the FASB issued ASU No. 2016-16, "*Intra-Entity Transfers of Assets Other Than Inventory*." This ASU requires entities to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs. For public entities, this ASU is effective for annual reporting periods beginning after December 15, 2017, including interim reporting periods within those annual reporting periods. The Company adopted this standard as of January 1, 2018 on a prospective basis. The adoption of this standard did not have a material impact on the Company's consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, "*Compensation-Stock Compensation (Topic 718) Scope of Modification Accounting.*" ASU 2017-09 provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. The standard is effective for interim and annual reporting periods beginning after December 15, 2017, with early adoption permitted. The Company adopted the standard as of January 1, 2018 on a prospective basis. The adoption of this standard did not have a material impact on the Company's consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09 (Topic 606) "*Revenue from Contracts with Customers*." Topic 606 supersedes the revenue recognition requirements in Topic 605 "Revenue Recognition" (Topic 605), and requires entities to recognize revenue when control of goods or services is transferred to customers at an amount that reflects the consideration to which the entity expects to be entitled in exchange for the goods or services. Under the prior standard, licensing companies generally reported revenue from per-unit royalty based arrangements one quarter in arrears. Under the new guidance, the Company estimates per-unit royalty-based revenue prior to receiving customer royalty reports. The Company also expects the standard to have a significant impact on the timing of revenue recognition associated with its fixed fee and minimum guarantee arrangements, as a majority of such revenue which had previously been recognized over the license term is expected to be recognized at the inception of the license term. On January 1, 2018, the Company adopted the new standard using the modified retrospective method, under which the Company recorded a $224 million cumulative net of tax adjustment to the opening balance of retained earnings on January 1, 2018. The adjustment was determined by measuring the impact of the new standard on existing contracts that were not completed as of December 31, 2017. Prior period comparative information has not been restated and continues to be reported under Topic 605 in effect for those periods. This new standard had a material impact on the Company's revenue and its consolidated statement of operations and balance sheet as of and for the year ended December 31, 2018, and is expected to have a material impact on an ongoing basis, with no impact on the timing of customer billings or on cash flows. See "Note 4 – *Revenue*" for further discussion.

The cumulative effect of the changes made to the Company's Consolidated Balance Sheet for the adoption of Topic 606 was as follows (in thousands):

	Balance at December 31, 2017	Adjustments due to Topic 606	Balance at January 1, 2018
Assets			
Unbilled contracts receivable	$ 10,866	$ 188,760	$ 199,626
Other current assets	$ 16,949	$ (2,000)	$ 14,949
Long-term unbilled contracts receivable	$ 2,930	$ 103,983	$ 106,913
Other assets	$ 9,772	$ (2,446)	$ 7,326
Liabilities			
Accrued liabilities	$ 47,969	$ 432	$ 48,401
Deferred revenue	$ 2,686	$ (783)	$ 1,903
Long-term deferred tax liabilities	$ 15,085	$ 64,520	$ 79,605
Equity			
Retained earnings	$ 68,556	$ 224,128	$ 292,684

The most significant impact from adopting Topic 606 was a substantial increase in unbilled contracts receivable, long-term deferred tax liabilities and retained earnings, which was driven primarily by applying the standard on fixed fee and minimum guarantee contracts that were not completed as of December 31, 2017, and secondarily by recording to retained earnings those royalties from customer shipments completed in the fourth quarter of 2017 and reported to the Company in the first quarter of 2018. The adoption of Topic 606 did not affect Company's reported total amounts of cash flows from operating, investing and financing activities on the Consolidated Statements of Cash Flows for the year ended December 31, 2018.

Adoption of the new revenue standard had the following impact on the Company's consolidated financial statements as compared to the comparable data under the previous accounting standards (in thousands, except per share amounts):

	Year Ended December 31, 2018		
STATEMENT OF OPERATIONS	**As Reported**	**Amounts under Topic 605**	**Effect of Change Higher/(lower)**
Royalty and license fees	$ 406,133	$ 426,973	$ (20,840)
Cost of revenue	13,291	8,610	4,681
Operating income	23,980	49,501	(25,521)
Other income and expense, net	8,595	923	7,672
Income before taxes	6,910	24,759	(17,849)
Provision for (benefit from) income taxes	8,673	(4,661)	13,334
Net income (loss)	(1,763)	29,420	(31,183)
Net income (loss) attributable to Xperi	$ (289)	$ 30,894	$ (31,183)
Basic/diluted net income (loss) per share attributable to Xperi	$ (0.01)	$ 0.63	$ (0.64)

	December 31, 2018		
BALANCE SHEET	**As Reported**	**Amounts under Topic 605**	**Effect of Change Higher/(lower)**
Assets			
Unbilled contracts receivable	$ 195,436	$ 753	$ 194,683
Other current assets	$ 17,434	$ 18,434	$ (1,000)
Long-term unbilled contracts receivable	$ 86,280	$ 1,556	$ 84,724
Long-term deferred tax assets	$ 3,677	$ 20,288	$ (16,611)
Liabilities			
Accrued liabilities	$ 45,336	$ 39,249	$ 6,087
Deferred revenue	$ 3,130	$ 4,233	$ (1,103)
Long-term deferred tax liabilities	$ 64,994	$ 1,127	$ 63,867
Equity			
Retained earnings	$ 253,208	$ 60,263	$ 192,945

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, "*Leases*" *(Topic 842)* (ASU 2016-02), which generally requires companies to recognize operating and financing lease liabilities and corresponding right-of-use (ROU) assets on the balance sheet. Under the standard, disclosures are required to meet the objective of enabling users of financial statements to assess the amount, timing, and uncertainty of cash flows arising from leases. The new standard is effective for the Company beginning January 1, 2019. The Company will adopt this new standard in the first quarter of fiscal 2019 using the optional transition method, under which the Company will apply the transition requirements to all leases that existed at December 31, 2018, with any residual effects of initially applying *Topic 842* recognized as a cumulative effect adjustment to the opening balance of retained earnings on January 1, 2019. The Company has completed its review of leasing arrangements and currently expects to record between $16 million and $20 million of operating lease ROU assets and related lease liabilities as of January 1, 2019. The Company does not expect the adoption of the new standard will have a material impact on its consolidated Statements of Operations or cash flows.

In September 2016, the FASB issued ASU No. 2016-13, "*Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*" ("ASU 2016-13"), which introduces an approach based on expected losses to estimate credit losses on certain types of financial instruments. It also modifies the impairment model for available-for-sale debt securities and provides for a simplified accounting model for purchased financial assets with credit deterioration since their origination. ASU 2016-13 is effective for the Company in the first quarter of the year ending December 31, 2020. The Company is in the process of evaluating the impact of the adoption of this new standard on its consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, "*Stock-based Compensation: Improvements to Nonemployee Share-based Payment Accounting,"* which amends the existing accounting standards for share-based payments to nonemployees. This ASU aligns much of the guidance on measuring and classifying nonemployee awards with that of awards to employees. Under the new guidance, the measurement of nonemployee equity awards is fixed on the grant date. The effective date for the standard is for interim periods in fiscal years beginning after December 15, 2018, with early adoption permitted, but no earlier than the Company's adoption date of Topic 606. The new guidance is required to be applied retrospectively with the cumulative effect recognized at the date of initial application. The Company will adopt this new standard in the first quarter of fiscal 2019 and does not expect that the adoption of the standard will have a material impact on its consolidated financial statements.

NOTE 4 – REVENUE

As discussed in Note 3, on January 1, 2018, the Company adopted Topic 606 using the modified retrospective method. Results for reporting periods beginning January 1, 2018 are presented under Topic 606, while prior period amounts are not restated and continue to be reported in accordance with the historic accounting under Topic 605.

Revenue Recognition

The Company derives its revenue primarily from royalty and license fees for rights to use the Company's intellectual property and technologies ("IP"). Revenue is recognized upon transfer of control of promised products, services or IP rights to customers in an amount that reflects the consideration the Company expects to receive in exchange for those products, services or licensing of the IP rights.

Certain licensees have entered into fixed fee or minimum guarantee arrangements, whereby licensees pay a fixed fee for the right to incorporate the Company's technology in the licensee's products over the license term. In arrangements with a minimum guarantee, the fixed fee component corresponds to a minimum number of units or dollars that the customer must produce or pay, with additional per-unit fees for any units or dollars exceeding the minimum. In most cases, the customer pays the fixed license fee in specified installments over the license term. For both fixed fee and minimum guarantee agreements, the Company recognizes the full fixed fee as revenue at the beginning of the license term, when the licensee has the right to use the IP and begins to benefit from the license.

If the contract term of a fixed fee or minimum guarantee arrangement is longer than one year, the Company also considers the scheduled payment arrangements to determine whether a significant financing component exists. In general, if the payment arrangements extend beyond the initial twelve months of the contract, the Company treats a portion of the payments as a significant financing component. When the payments are expected to be received within one year or less, the Company does not adjust the promised amount of consideration for the effects of a financing component. The discount rate used for each arrangement reflects the rate that would be used in a separate financing transaction between the Company and the licensee at contract inception and takes into account the credit characteristics of the licensee and market interest rates as of the date of the agreement. As such, the amount of fixed fee revenue recognized at the beginning of the license term will be reduced by the calculated financing component. As payments are received from the licensee, the Company recognizes a portion of the financing component as interest income, reported as other income and expense in the Consolidated Statements of Operations.

For certain licensees, royalty revenues are generated based on a licensee's production or shipment of licensed products incorporating the Company's IP, technologies or software. Licensees with a per-unit arrangement pay a per-unit royalty for each product manufactured or sold, as set forth in its license agreement. Licensees generally report manufacturing or sales information in the quarter subsequent to when the production or shipment activity takes place. The Company estimates the royalties earned each quarter based on its forecast of manufacturing and sales activity incurred by its licensees in that quarter. Any differences between actual royalties owed by a licensee and the Company's quarterly estimate are recognized in the following quarter, when the licensee's royalty report is received. Estimating licensees' quarterly royalties prior to receiving the royalty reports requires the Company to make significant assumptions and judgments that could have a material impact on the amount of revenue it reports on a quarterly basis.

The Company actively monitors and enforces its IP, including seeking appropriate compensation from customers that have under-reported royalties owed under a license agreement and from third parties that utilize the Company's intellectual property without a license. As a result of these activities, the Company may, from time to time, recognize revenue from payments resulting from periodic compliance audits of licensees for underreporting royalties incurred in prior periods, as part of a settlement of a patent infringement dispute, or from legal judgments in a license dispute. These recoveries and settlements may cause revenue to be higher than expected during a particular reporting period and such recoveries may not occur in subsequent periods. The Company recognizes revenue from recoveries when a binding agreement has been executed and the Company concludes collection under that agreement is likely.

In some instances, the Company may enter into license agreements containing multiple performance obligations that include engineering services in addition to a technology or software license. For such arrangements where all components are capable of being distinct and accounted for as separate performance obligations, the Company allocates revenue to each performance obligation based on its relative standalone selling price. The Company generally determines standalone selling prices based on the prices ordinarily charged to customers, or in some cases by applying a reasonable cost-plus margin. The consideration for engineering services is recognized as the underlying performance obligations are satisfied. Generally, the Company satisfies performance obligations over time and therefore recognizes revenue over time by measuring the progress toward completion of the performance obligation at each reporting period.

From time to time, the Company enters into arrangements with licensees in which the Company pays consideration to the licensee. Such payments can take the form of marketing development funds or various rebate incentives. The Company typically accounts for consideration paid to its licensees as a reduction to the transaction price and revenue, unless the payment to the licensee is in exchange for a distinct good or service that the licensee transfers to the Company. In cases where the consideration paid to the licensee is variable, the Company estimates the variable consideration based on the terms of the arrangement and expectations of future outcomes. The Company recognizes the reduction to revenue when it recognizes revenue for transfer of control of promised products, services or IP rights to the licensee.

Revenue is recognized gross of withholding taxes that are remitted directly by the Company's licensees to a local tax authority.

For additional detail on the Company's revenue disaggregated by geographic location, refer to "Note 16 - *Segment and Geographic Information*."

Contract Balances

Unbilled Contracts Receivable

Timing of revenue recognition may differ significantly from the timing of invoicing to customers. Accounts receivable, net, includes amounts billed and currently due from customers. Unbilled contracts receivable represents unbilled amounts expected to be received from customers in future periods, where the revenue recognized to date (or cumulative adjustments to retained earnings in the initial period of adopting Topic 606) exceeds the amount billed, and right to payment is subject to the underlying contractual terms. Unbilled contracts receivable amounts may not exceed their net realizable value and are classified as long-term assets if the payments are expected to be received more than one year from the reporting date.

Deferred Revenue

Deferred revenue includes payments made by licensees for which the corresponding performance obligations have not yet been fully satisfied by the Company and typically arises where performance obligations are satisfied over time.

Additional Disclosures Under Topic 606

The following table presents additional revenue and contract disclosures (in thousands):

	Years Ended December 31,	
	2018	2017
Revenue recognized in the period from:		
Amounts included in deferred revenue at the beginning of the period	$ 2,347	$ 876
Performance obligations satisfied in previous periods (true ups and licensee reporting adjustments)*	$ 1,323	$ 5,091

*True ups represent the differences between the Company's quarterly estimates of per unit royalty revenue and actual production/sales-based royalties reported by licensees in the following period. Licensee reporting adjustments represent corrections or revisions to previously reported per unit royalties by licensees, generally resulting from the Company's inquiries or compliance audits.

Remaining revenue under contracts with performance obligations represents the aggregate amount of the transaction price allocated to the performance obligations that are unsatisfied (or partially unsatisfied) under the Company's engineering services contracts. The Company's remaining revenue under contracts with performance obligations was as follows (in thousands):

	December 31,	
	2018	2017
Revenue from contracts with performance obligations expected to be satisfied in:		
One year or less	$ 3,080	$ 2,440
More than one year but less than two years	2,289	149
More than two years	—	240
Total	$ 5,369	$ 2,829

Practical Expedients

The Company expenses sales commissions when incurred because the amortization period generally would have been one year or less. In addition, sales commissions have historically not been a significant expense and are not contemplated to be significant in the future. Sales commissions are recorded in selling, general and administrative expenses in the Consolidated Statement of Operations.

NOTE 5 – COMPOSITION OF CERTAIN FINANCIAL STATEMENT CAPTIONS

Other current assets consisted of the following (in thousands):

	December 31,	
	2018	2017
Prepaid income taxes	$ 6,768	$ 6,713
Prepaid expenses	8,293	6,655
Other	2,373	3,581
	$ 17,434	$ 16,949

Property and equipment, net consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Equipment, furniture and other	$ 28,798	$ 26,029
Building and improvements	18,258	18,222
Land	5,300	5,300
Leasehold improvements	6,367	6,469
	58,723	56,020
Less: Accumulated depreciation and amortization	(27,686)	(21,578)
	$ 31,037	$ 34,442

Depreciation and amortization expense for the years ended December 31, 2018, 2017 and 2016 amounted to $6.7 million, $7.2 million and $2.3 million, respectively.

Accrued liabilities consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Employee compensation and benefits	$ 26,858	$ 37,056
Third-party royalties	7,140	1,138
Accrued expenses	3,994	4,690
Other	7,344	5,085
	$ 45,336	$ 47,969

Accumulated other comprehensive loss consisted of the following (in thousands):

	December 31, 2018	December 31, 2017
Net unrealized loss on available-for-sale debt securities, net of tax	$ (328)	$ (303)
	$ (328)	$ (303)

Other income and expense, net, consisted of the following (in thousands):

	Years Ended December 31, 2018	Years Ended December 31, 2017
Interest income from significant financing components under Topic 606	$ 7,672	$ —
Interest income from investments	1,074	1,071
Unrealized loss on marketable equity securities	(2,217)	—
Other income	2,066	378
	$ 8,595	$ 1,449

NOTE 6 – FINANCIAL INSTRUMENTS

The Company has investments in debt securities which include corporate bonds and notes, treasury and agency notes and bills, commercial paper, certificates of deposit, and in equity securities consisting of money market funds and common equity securities of a publicly traded Japanese company. The Company classifies its debt securities as available-for-sale, which are accounted for at fair value with unrealized gains and losses recognized in accumulated other comprehensive income or loss, net of tax, on the Consolidated Balance Sheets.

Prior to January 1, 2018, the Company accounted for equity securities in the same manner as debt securities. Realized gains and losses on equity securities sold, if any, were recognized in other income and expense, net, on the Consolidated Statements of Operations.

On January 1, 2018, the Company adopted ASU 2016-01 (Topic 321) which requires equity securities to be measured at fair value and starting January 1, 2018 unrealized gains and losses are recognized in other income and expense, net, on the Consolidated Statements of Operations.

The following is a summary of marketable securities at December 31, 2018 and December 31, 2017 (in thousands):

	December 31, 2018			
	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Values
Marketable securities				
Corporate bonds and notes	$ 28,623	$ —	$ (275)	$ 28,348
Commercial paper	2,999	—	—	2,999
Treasury and agency notes and bills	6,000	—	(53)	5,947
Total debt securities	37,622	—	(328)	37,294
Money market funds	11,499	—	—	11,499
Marketable equity securities	5,662	—	(2,217)	3,445
Total equity securities	17,161	—	(2,217)	14,944
Total marketable securities	$ 54,783	$ —	$ (2,545)	$ 52,238
Reported in:				
Cash and cash equivalents				$ 11,499
Short-term investments				40,739
Total marketable securities				$ 52,238

	December 31, 2017			
	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Values
Marketable securities				
Corporate bonds and notes	$ 45,803	$ —	$ (230)	$ 45,573
Commercial paper	2,392	—	(2)	2,390
Treasury and agency notes and bills	6,000	—	(71)	5,929
Certificates of deposit	8,540	—	—	8,540
Total debt securities	62,735	—	(303)	62,432
Money market funds - equity securities	40,413	—	—	40,413
Total marketable securities	$ 103,148	$ —	$ (303)	$ 102,845
Reported in:				
Cash and cash equivalents				$ 40,413
Short-term investments				62,432
Total marketable securities				$ 102,845

At December 31, 2018 and December 31, 2017, the Company had $154.4 million and $200.7 million, respectively, in cash, cash equivalents and short-term investments. A significant portion of these amounts was held in marketable securities, as shown above. The remaining balance of $102.1 million and $97.8 million at December 31, 2018 and December 31, 2017, respectively, was cash held in operating accounts not included in the tables above.

Debt Securities

The gross realized gains and losses on sales of marketable securities were not significant during the years ended December 31, 2018, 2017 and 2016.

Unrealized losses on marketable debt securities were $0.3 million and $0.3 million, net of tax, as of December 31, 2018 and December 31, 2017, respectively. These amounts were related to temporary fluctuations in value of available-for-sale securities and were due primarily to changes in interest rates and market and credit conditions of the underlying securities. Certain investments with a temporary decline in value are not considered to be other-than-temporarily impaired as of December 31, 2018 because the Company has the intent and ability to hold these investments to allow for recovery, does not anticipate having to sell these securities with unrealized losses and continues to receive interest at the maximum contractual rate. For the years ended December 31, 2018, 2017 and 2016, respectively, the Company did not record any impairment charges related to its marketable securities.

The following table summarizes the fair value and gross unrealized losses related to individual available-for-sale securities at December 31, 2018 and 2017, which have been in a continuous unrealized loss position, aggregated by investment category and length of time (in thousands):

December 31, 2018	Less Than 12 Months		12 Months or More		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Corporate bonds and notes	$ 5,488	$ (2)	$ 22,860	$ (273)	$ 28,348	$ (275)
Treasury and agency notes and bills	—	—	5,947	(53)	5,947	(53)
Commercial paper	2,999	—	—	—	2,999	—
Total	$ 8,487	$ (2)	$ 28,807	$ (326)	$ 37,294	$ (328)

December 31, 2017	Less Than 12 Months		12 Months or More		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Corporate bonds and notes	$ 30,811	$ (189)	$ 14,762	$ (41)	$ 45,573	$ (230)
Treasury and agency notes and bills	—	—	5,929	(71)	5,929	(71)
Commercial paper	2,390	(2)	—	—	2,390	(2)
Total	$ 33,201	$ (191)	$ 20,691	$ (112)	$ 53,892	$ (303)

The estimated fair value of marketable debt securities by contractual maturity at December 31, 2018 is shown below (in thousands). Actual maturities may differ from contractual maturities because issuers may have the right to call or prepay obligations without call or prepayment penalties.

	Estimated Fair Value
Due in one year or less	$ 27,642
Due in one to two years	9,652
Due in two to three years	—
Total	$ 37,294

Equity Securities

There were no realized gains or losses on sales of equity securities during the years ended December 31, 2018, 2017 and 2016, respectively.

The Company had unrealized losses of $2.2 million on marketable equity securities during the year ended December 31, 2018, and none for the years ended December 31, 2017 and 2016, respectively.

On September 19, 2018, the Company purchased seven million common shares of Onkyo Corporation (“Onkyo”), a publicly traded Japanese company, pursuant to the Capital Alliance Agreement (“Agreement”) entered into between the two parties on September 3, 2018. Upon making the investment, the Company holds a 6.3% ownership interest in Onkyo and had one representative appointed to the board of directors of a subsidiary of Onkyo in November 2018. The Company also expects to have one representative appointed to serve on the board of directors of Onkyo effective with its next scheduled shareholders meeting in June 2019. The Agreement contemplates that the parties will negotiate a business alliance agreement aimed at collaborating on certain new product development within IOT, AI and wireless audio. Onkyo is a long-term customer of the Company.

NOTE 7 – FAIR VALUE

The Company follows the authoritative guidance fair value measurement and the fair value option for financial assets and financial liabilities. The Company carries its financial instruments at fair value with the exception of its long-term debt. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability, or an exit price, in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The established fair value hierarchy 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.

Level 2 Observable market-based inputs or unobservable inputs that are corroborated by market data.

Level 3 Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets. Level 3 assets and liabilities include financial instruments whose value is determined using pricing models, discounted cash flow methodologies, or similar techniques, as well as instruments for which the determination of fair value requires significant management judgment or estimation.

When applying fair value principles in the valuation of assets, the Company is required to maximize the use of quoted market prices and minimize the use of unobservable inputs. The Company calculates the fair value of its Level 1 and Level 2 instruments based on the exchange traded price of similar or identical instruments, where available, or based on other observable inputs. There were no significant transfers into or out of Level 1 or Level 2 that occurred between December 31, 2017 and December 31, 2018.

The following is a list of the Company's assets required to be measured at fair value on a recurring basis and where they were classified within the hierarchy as of December 31, 2018 (in thousands):

	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Marketable securities				
Money market funds - equity securities (1)	$ 11,499	$ 11,499	$ —	$ —
Marketable equity securities (2)	3,445	3,445	—	—
Commercial paper - debt securities (2)	2,999	—	2,999	—
Corporate bonds and notes - debt securities (2)	28,348	—	28,348	—
Treasury and agency notes and bills - debt securities (2)	5,947	—	5,947	—
Total Assets	$ 52,238	$ 14,944	$ 37,294	$ —

The following footnotes indicate where the noted items were recorded in the Consolidated Balance Sheet at December 31, 2018:

(1) Reported as cash and cash equivalents.
(2) Reported as short-term investments.

The following is a list of the Company's assets required to be measured at fair value on a recurring basis and where they were classified within the hierarchy as of December 31, 2017 (in thousands):

	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Marketable securities				
Money market funds - equity securities (1)	$ 40,413	$ 40,413	$ —	$ —
Certificates of deposit - debt securities (2)	8,540	—	8,540	—
Corporate bonds and notes - debt securities (2)	45,573	—	45,573	—
Treasury and agency notes and bills - debt securities (2)	5,929	—	5,929	—
Commercial paper - debt securities (2)	2,390	—	2,390	—
Total Assets	$ 102,845	$ 40,413	$ 62,432	$ —

The following footnotes indicate where the noted items were recorded in the Consolidated Balance Sheet at December 31, 2017:

(1) Reported as cash and cash equivalents.
(2) Reported as short-term investments.

Financial Instruments Not Recorded at Fair Value on a Recurring Basis

The Company's long-term debt is carried at historical cost and is measured at fair value on a quarterly basis for disclosure purposes. The carrying amounts and estimated fair values are as follows (in thousands):

	December 31, 2018		December 31, 2017	
	Carrying Amount	Estimated Fair Value	Carrying Amount	Estimated Fair Value
Long-term debt, net (1)	$ 482,193	$ 450,083	$ 579,662	$ 585,362

(1) Carrying amounts of long-term debt are net of unamortized debt issuance costs of $11.8 million and $14.3 million as of December 31, 2018 and December 31, 2017, respectively. See "Note 10 – *Debt*" for additional information.

The Company's long-term debt, net, is classified within Level 2. The fair value of the debt was estimated based on the quoted market prices for the same or similar issues or on the current rates offered to the Company for debt of the same remaining maturities.

Non-Recurring Fair Value Measurements

The following table represents the activity in level 3 assets (in thousands):

	Assets held for sale	Other	
Balance at December 31, 2016	$ —	$ 4,280	(1)
Assets transferred	—	—	
Assets sold	—	—	
Assets received	—	1,664	(2)
Balance at December 31, 2017	$ —	$ 5,944	
Assets transferred	—	—	
Assets sold	—	—	
Assets received	—	—	
Balance at December 31, 2018	$ —	$ 5,944	(3)

(1) This amount represents the value of the patents that were received as part of licensing settlements with customers in fiscal 2014. These assets were valued during the same year using a cost methodology based on an arms-length purchase price of bulk patent assets, with adjustments based on limited pick rights, the total available market, and remaining average patent life.
(2) This amount represents the value of patents received as part of a licensing settlement with a customer. These assets were valued using a cost methodology based on prior arms-length patent purchases by both the company and other third party acquirers.
(3) The accumulated amortization associated with the patents was $3.3 million and $2.3 million as of December 31, 2018 and 2017, respectively.

NOTE 8 - BUSINESS COMBINATIONS

DTS, Inc.

On December 1, 2016, the Company completed its acquisition of DTS for approximately $955 million, net of $53.4 million in cash acquired. DTS is a premier audio technology solutions provider for high-definition entertainment experiences. The transaction combined DTS's advanced audio technologies with the Company's existing complementary products, technologies, customer channels and intellectual property assets to enable the creation of an expanded, integrated platform to invent the future of smart sight and sound.

NOTE 9 – GOODWILL AND IDENTIFIED INTANGIBLE ASSETS

In 2018, the Company assessed goodwill impairment for its segments by performing a qualitative assessment. No impairment of goodwill was indicated as the Company concluded that it was more likely than not that the fair value of its reporting units exceeded its carrying amount. In addition, there have been no significant events or circumstances affecting the valuation of goodwill subsequent to the impairment testing performed in the fourth quarter of the year ended December 31, 2018.

The changes to the carrying value of goodwill from January 1, 2017 through December 31, 2018 are reflected below (in thousands):

December 31, 2016	$	382,963	
Purchase price adjustment related to the acquisition of DTS		2,611	
December 31, 2017	$	385,574	
Goodwill acquired through a business acquisition		210	(1)
December 31, 2018	$	385,784	(2)

(1) Related to the acquisition of an emerging technology company in May 2018.
(2) Of this amount, approximately $378.1 million is allocated to the Company's Product Licensing reporting segment and approximately $7.7 million is allocated to its Semiconductor and IP Licensing reporting segment.

Identified intangible assets consisted of the following (in thousands):

		December 31, 2018			December 31, 2017		
	Average Life (Years)	**Gross Assets**	**Accumulated Amortization**	**Net**	**Gross Assets**	**Accumulated Amortization**	**Net**
Acquired patents / core technology	3-15	$ 146,684	$ (128,691)	$ 17,993	$ 142,584	$ (113,349)	$ 29,235
Existing technology	5-10	206,878	(96,089)	110,789	204,394	(61,518)	142,876
Customer contracts and related relationships	3-9	291,769	(121,831)	169,938	291,769	(68,267)	223,502
Trademarks/trade name	4-10	40,083	(11,083)	29,000	40,083	(6,111)	33,972
Non-competition agreements	1	2,231	(2,231)	—	2,231	(2,231)	—
Total amortizable intangible assets		687,645	(359,925)	327,720	681,061	(251,476)	429,585
In-Process R&D		—	—	—	2,204	—	2,204
Total intangible assets		$ 687,645	$ (359,925)	$ 327,720	$ 683,265	$ (251,476)	$ 431,789

Amortization expense for the years ended December 31, 2018, 2017, and 2016 amounted to $108.5 million, $111.9 million and $31.9 million, respectively. As of December 31, 2018, the estimated future amortization expense of intangible assets is as follows (in thousands):

2019	$	99,945
2020		88,231
2021		80,522
2022		32,082
2023		21,203
Thereafter		5,737
	$	327,720

NOTE 10 – DEBT

On December 1, 2016, in connection with the consummation of the acquisition of DTS, the Company entered into a Credit Agreement (the "Credit Agreement") by and among the Company, Royal Bank of Canada, as administrative agent and collateral agent, and the lenders party thereto. The Credit Agreement provided for a $600 million seven-year term B loan facility (the "Term B Loan Facility") which matures on November 30, 2023. Upon the closing of the Credit Agreement, the Company borrowed $600 million under the Term B Loan facility. Net proceeds were used on December 1, 2016, together with cash and cash equivalents, to finance the acquisition of DTS.

On January 23, 2018, the Company and the loan parties entered into an amendment to the Credit Agreement (the "Amendment"). In connection with the Amendment, the Company made a voluntary prepayment of $100.0 million of the term loan outstanding under the Credit Agreement using cash on hand. The Amendment provided for, among other things, (i) a replacement of the outstanding initial term loan with the new tranche term B-1 loan (the "Amended Term B Loan") in a principal amount of $494.0 million, (ii) a reduction of the interest rate margin applicable to such loan to (x) in the case of Eurodollar loans, 2.50% per annum and (y) in the case of base rate loans, 1.50% per annum, (iii) a prepayment premium of 1.00% in connection with any repricing transaction with respect to the Amended Term B Loan within six months of the closing date of the Amendment, and (iv) certain amendments to provide the Company with additional flexibility under the covenant governing restricted payments.

The Company's obligations under the Credit Agreement, as amended by the Amendment, continue to be guaranteed by substantially all of the Company's subsidiaries, and secured by substantially all of the assets of the Company and its subsidiaries. The Credit Agreement contains customary events of default, upon the occurrence of which, after any applicable grace period, the lenders will have the ability to accelerate all outstanding loans thereunder. The Credit Agreement contains customary representations and warranties and affirmative and negative covenants that, among other things, restrict the ability of the Company to create or incur certain liens, incur or guarantee additional indebtedness, merge or consolidate with other companies, transfer or sell assets and make restricted payments. The Company was in compliance with all requirements during the year ended December 31, 2018.

All lenders of the Term B Loan Facility participated in the Amendment and the changes in terms were not considered substantial. Accordingly, the repricing event was accounted for as a debt modification. The Company elected to continue to defer the unamortized debt issuance costs related to the partial pay-down of the debt as the prepayment was factored into the terms agreed to on the debt.

At December 31, 2018, $494.0 million was outstanding with an interest rate, including the amortization of debt issuance costs, of 5.1%. Interest is payable monthly. There were also $11.8 million of unamortized debt issuance costs recorded as a reduction of the long-term portion of the debt. At December 31, 2017, $594 million was outstanding with unamortized debt issuance costs amounting to $14.3 million. Interest expense was $25.7 million and $28.3 million for the years ended December 31, 2018 and 2017, respectively. Amortized debt issuance costs, which were included in interest expense, amounted to $2.5 million and $2.4 million for the years ended December 31, 2018 and 2017, respectively. Other than the voluntary prepayment of $100.0 million in January 2018, there were no other debt principal payments in 2018 as the prepayment exceeded the minimum principal payment requirements. Total debt principal payments were $6.0 million in 2017.

As of December 31, 2018, future minimum principal payments for long-term debt, including the current portion, are summarized as follows (in thousands):

2019	$	—
2020		—
2021		—
2022		—
2023		494,000
Total	$	494,000

Additional payments of debt principal must be made in the event of certain working capital conditions as outlined in the Credit Agreement. There are no penalties for these payments. There were no such additional payments made during the years ended December 31, 2018 and 2017, respectively.

NOTE 11 – NET INCOME (LOSS) PER SHARE

The Company has a share-based compensation plan under which employees may be granted share-based awards including shares of restricted stock and restricted stock units ("RSUs"). Non-forfeitable dividends are paid on unvested shares of restricted stock. No dividends are accrued or paid on unvested RSUs. As such, shares of restricted stock are considered participating securities under the two-class method of calculating earnings per share. The two-class method of calculating earnings per share did not have a material impact on the Company's earnings per share calculation as of December 31, 2018, 2017 and 2016.

The following table sets forth the computation of basic and diluted shares (in thousands):

	Years Ended December 31,		
	2018	2017	2016
Denominator:			
Weighted average common shares outstanding	48,823	49,253	49,203
Unvested common shares subject to repurchase	—	(2)	(16)
Total common shares-basic	48,823	49,251	49,187
Effect of dilutive securities:			
Options	—	—	357
Restricted stock awards and units	—	—	646
Total common shares-diluted	48,823	49,251	50,190

Basic net income (loss) per share is computed using the weighted average number of common shares outstanding during the period, excluding any unvested restricted stock awards that are subject to repurchase. Diluted net income (loss) per share is computed using the treasury stock method to calculate the weighted average number of common shares and, if dilutive, potential common shares outstanding during the period. Potential dilutive common shares include unvested restricted stock awards and units and incremental common shares issuable upon the exercise of stock options, less shares from assumed proceeds. The assumed proceeds calculation includes actual proceeds to be received from the employee upon exercise and the average unrecognized stock compensation cost during the period.

For each of the years ended December 31, 2018 and 2017, there was no difference in the weighted average number of common shares used for the calculation of basic and diluted loss per share as the effect of all potentially dilutive shares outstanding was anti-dilutive. A total of 2.9 million and 3.0 million shares subject to stock options and restricted stock awards and units were excluded for the years ended December 31, 2018 and 2017, respectively, from the computation of diluted net loss per share because including them would have been anti-dilutive.

For the year ended December 31, 2016, in the calculation of net income per share, 0.7 million shares subject to stock options and restricted stock awards and units were excluded from the computation of diluted net income per share as they were anti-dilutive.

NOTE 12 – SHAREHOLDERS' EQUITY

Stock Repurchase Programs

In August 2007, the Company's Board of Directors ("the Board") authorized a plan to repurchase the Company's outstanding shares of common stock dependent on market conditions, share price and other factors. As of December 31, 2018, the total amount authorized for repurchases is $450.0 million. As of December 31, 2018, the Company had repurchased a total of approximately 13,279,000 shares of common stock, since inception of the plan, at an average price of $26.25 per share for a total cost of $348.6 million. As of December 31, 2017, the Company had repurchased a total of approximately 11,142,000 shares of common stock, since inception of the plan, at an average price of $27.57 per share for a total cost of $307.2 million. The shares repurchased are recorded as treasury stock and are accounted for under the cost method. No expiration date has been specified for this plan. As of December 31, 2018, the total amount available for repurchase was $101.4 million. The Company plans to continue to execute authorized repurchases from time to time under the plan.

Stock Option Plans

The 2003 Plan

In February 2003, the Board adopted and the Company's stockholders approved the 2003 Equity Incentive Plan ("2003 Plan"). Under the 2003 Plan, incentive stock options may be granted to the Company's employees at an exercise price of no less than 100% of the fair value on the date of grant, and non-statutory stock options may be granted to the Company's employees, non-employee directors and consultants at an exercise price of no less than 85% of the fair value. In both cases, when the optionees own stock representing more than 10% of the voting power of all classes of stock of the Company, the exercise price shall be no less than 110% of the fair value on the date of grant. Options, restricted stock awards, and restricted stock units granted under this plan generally have a term of ten years from the date of grant and vest over a four-year period. Restricted stock, performance awards, dividend equivalents, deferred stock, stock payments and stock appreciation rights may also be granted under the 2003 Plan either alone, in addition to, or in tandem with any options granted thereunder. Restricted stock awards and units are full-value awards that reduce the number of shares reserved for grant under this plan by one and one-half shares for each share granted. The vesting criteria for restricted stock awards and units is generally the passage of time or meeting certain performance-based objectives, and continued employment through the vesting period generally over four years. As of December 31, 2018, there were approximately 3.6 million shares reserved for future grant under this plan.

A summary of the stock option activity is presented below (in thousands, except per share amounts):

	Options Outstanding			
	Number of Shares Subject to Options	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value
Balance at December 31, 2015	1,142	$ 20.63		
Options assumed	586	$ 29.05		
Options exercised	(350)	$ 20.01		
Options canceled / forfeited / expired	(46)	$ 23.25		
Balance at December 31, 2016	1,332	$ 24.41		
Options granted	70	$ 22.45		
Options exercised	(180)	$ 23.04		
Options canceled / forfeited / expired	(50)	$ 34.73		
Balance at December 31, 2017	1,172	$ 24.06		
Options granted	—	$ -		
Options exercised	(427)	$ 18.75		
Options canceled / forfeited / expired	(67)	$ 34.43		
Balance at December 31, 2018	678	$ 26.39	4.62	$ 202
Vested and expected to vest at December 31, 2018	663		4.53	$ 202
Exercisable at December 31, 2018	595		4.14	$ 202

The following table summarizes information about stock options outstanding and exercisable under all of the Company's plans at December 31, 2018:

Range of Exercise Prices per Share	Options Outstanding: Number Outstanding (in thousands)	Options Outstanding: Weighted Average Remaining Contractual Life (in years)	Options Outstanding: Weighted Average Exercise Price per Share	Options Exercisable: Number Exercisable (in thousands)	Options Exercisable: Weighted Average Exercise Price per Share
$12.52 - $18.52	69	3.96	$ 15.46	69	$ 15.46
$18.65 - $19.24	97	4.43	$ 19.00	97	$ 19.00
$19.34 - $19.73	79	4.56	$ 19.53	79	$ 19.53
$20.21 - $21.30	87	4.86	$ 20.66	87	$ 20.66
$22.19 - $22.24	29	5.30	$ 22.19	29	$ 22.19
$22.45 - $22.45	70	8.79	$ 22.45	18	$ 22.45
$22.52 - $36.78	69	4.98	$ 27.27	49	$ 27.99
$38.42 - $38.65	42	6.43	$ 38.64	31	$ 38.64
$41.15 - $41.15	7	0.13	$ 41.15	7	$ 41.15
$43.77 - $43.77	129	1.99	$ 43.77	129	$ 43.77
$12.52 - $43.77	678	4.62	$ 26.39	595	$ 26.55

Restricted Stock Awards and Units

Information with respect to outstanding restricted stock awards and units as of December 31, 2018 is as follows (in thousands, except per share amounts):

	Restricted Stock and Restricted Stock Units: Number of Shares Subject to Time-based Vesting	Number of Shares Subject to Performance-based Vesting	Total Number of Shares	Weighted Average Grant Date Fair Value Per Share
Balance at December 31, 2015	690	519	1,209	$ 29.28
Awards and units granted	596	86	682	$ 30.85
Awards assumed	925	—	925	$ 40.13
Awards and units vested / earned	(398)	(84)	(482)	$ 32.18
Awards and units canceled / forfeited	(117)	(137)	(254)	$ 29.64
Balance at December 31, 2016	1,696	384	2,080	$ 33.91
Awards and units granted	1,049	919	1,968	$ 32.60
Awards and units vested / earned	(581)	(94)	(675)	$ 33.70
Awards and units canceled / forfeited	(150)	(90)	(240)	$ 31.07
Balance at December 31, 2017	2,014	1,119	3,133	$ 33.35
Awards and units granted	1,087	44	1,131	$ 21.85
Awards and units vested / earned	(695)	(176)	(871)	$ 34.84
Awards and units canceled / forfeited	(257)	(230)	(487)	$ 29.35
Balance at December 31, 2018	2,149	757	2,906	$ 29.10

Performance Awards and Units

Performance awards and units may be granted to employees or consultants based upon, among other things, the contributions, responsibilities and other compensation of the particular employee or consultant. The value and the vesting of such performance awards and units are generally linked to one or more performance goals or other specific performance goals determined by the Company, in each case on a specified date or dates or over any period or periods determined by the Company, and range from zero to 100 percent of the grant.

Employee Stock Purchase Plans

In August 2003, the Board adopted the 2003 Employee Stock Purchase Plan (the "ESPP"), which was approved by the Company's stockholders in September 2003 and became effective February 1, 2004. Subsequently, the Board adopted the International Employee Stock Purchase Plan (the "International ESPP") in June 2008.

The ESPP has a series of consecutive, overlapping 24-month offering periods. The first offering period commenced February 1, 2004, the effective date of the ESPP, as determined by the Board of Directors.

Individuals who own less than 5% of the Company's voting stock, are scheduled to work more than 20 hours per week and whose customary employment is for more than five months in any calendar year may join an offering period on the first day of the offering period or the beginning of any semi-annual purchase period within that period. Individuals who become eligible employees after the start date of an offering period may join the ESPP at the beginning of any subsequent semi-annual purchase period.

Participants may contribute up to 20% of their cash earnings through payroll deductions, and the accumulated deductions will apply to the purchase of shares on each semi-annual purchase date. The purchase price per share will equal 85% of the fair market value per share on the participant's entry date into the offering period or, if lower, 85% of the fair market value per share on the semi-annual purchase date.

An eligible employee's right to buy the Company's common stock under the ESPP may not accrue at a rate in excess of $25,000 of the fair market value of such shares per calendar year for each calendar year of an offering period. If the fair market value per share of the Company's common stock on any purchase date is less than the fair market value per share on the start date of the 24-month offering period, then that offering period will automatically terminate and a new 24-month offering period will begin on the next business day. All participants in the terminated offering will be transferred to the new offering period.

As of December 31, 2018, there were approximately 1,137,000 shares reserved for grant under the ESPP and the International ESPP, collectively.

Dividends

Stockholders of the Company's common stock are entitled to receive dividends when declared by the Company's Board of Directors. The Company has paid a quarterly dividend of $0.20 per share since March 2015. Dividends declared were $0.80, per common share in each of 2018, 2017 and 2016.

Assumed Plans

Certain stock awards plans were assumed in the DTS acquisition. The awards outstanding under these plans are included in the tables above. No future grants will be made under these plans.

NOTE 13 – STOCK-BASED COMPENSATION EXPENSE

The effect of recording stock-based compensation expense for the years ended December 31, 2018, 2017 and 2016 is as follows (in thousands):

	Years Ended December 31,		
	2018	**2017**	**2016**
Cost of revenue	$ —	$ —	$ —
Research, development and other related costs	13,168	13,277	7,104
Selling, general and administrative	17,843	20,185	13,997
Total stock-based compensation expense	31,011	33,462	21,101
Tax effect on stock-based compensation expense	(4,869)	(5,296)	(6,314)
Net effect on net income	$ 26,142	$ 28,166	$ 14,787

Stock-based compensation expense categorized by various equity components for the years ended December 31, 2018, 2017 and 2016 is summarized in the table below (in thousands):

	Years Ended December 31,		
	2018	2017	2016
Employee stock options	$ 438	$ 1,980	$ 3,249
Restricted stock awards and units	27,974	28,909	17,024
Employee stock purchase plan	2,599	2,573	828
Total stock-based compensation expense	$ 31,011	$ 33,462	$ 21,101

During the years ended December 31, 2018, 2017 and 2016, the Company granted stock options covering zero, 70,000 and zero shares, respectively. In December 2016, the Company assumed and granted stock awards covering 682,000 shares in connection with the DTS acquisition. The 2017 and 2016 estimated per share fair value of those grants was $4.62 and $15.87, respectively, before estimated forfeitures.

The total fair value of restricted stock awards and units vested during the years ended December 31, 2018, 2017 and 2016 was $30.4 million, $22.7 million and $15.9 million, respectively.

The total intrinsic value of options exercised during the years ended December 31, 2018, 2017 and 2016 was $1.0 million, $5.5 million and $9.3 million, respectively. The intrinsic value is calculated as the difference between the market value on the date of exercise and the exercise price of the shares.

As of December 31, 2018, the unrecognized stock-based compensation balance after estimated forfeitures related to unvested stock options was $0.3 million to be recognized over an estimated weighted average amortization period of 2.0 years and $40.6 million related to restricted stock awards and units, including performance-based awards and units, to be recognized over an estimated weighted average amortization period of 2.2 years.

As of December 31, 2017, the unrecognized stock-based compensation balance after estimated forfeitures related to unvested stock options was $0.7 million to be recognized over an estimated weighted average amortization period of 1.8 years and $48.8 million related to restricted stock awards and units, including performance-based awards and units, to be recognized over an estimated weighted average amortization period of 2.4 years.

The Company uses the Black-Scholes option pricing model to determine the estimated fair value of options. The fair value of each option grant is determined on the date of grant and the expense is recorded on a straight-line basis. The assumptions used in the model include expected life, volatility, risk-free interest rate, and dividend yield. The Company's determinations of these assumptions are outlined below.

Expected life – The expected life assumption is based on analysis of the Company's historical employee exercise patterns. The expected life of options granted under the ESPP represents the offering period of two years.

Volatility – Volatility is calculated using the historical volatility of the Company's common stock for a term consistent with the expected life. Historical volatility of the Company's common stock is also utilized for the ESPP.

Risk-free interest rate – The risk-free interest rate assumption is based on the U.S. Treasury rate for issues with remaining terms similar to the expected life of the options.

Dividend yield – Expected dividend yield is calculated based on cash dividends declared by the Board for the previous four quarters and dividing that result by the average closing price of the Company's common stock for the quarter. Cash dividends are not paid on options, restricted stock units or unvested restricted stock awards.

In addition, the Company estimates forfeiture rates. Forfeitures are estimated at the time of grant and revised in subsequent periods if actual forfeitures differ from those estimates. Historical data is used to estimate pre-vesting option forfeitures and record stock-based compensation expense only for those awards that are expected to vest.

The following assumptions were used to value the awards granted:

	Years Ended December 31,		
	2018*	2017	2016
Expected life (in years)	—	4.7	3.8
Risk-free interest rate	—	1.8%	1.7%
Dividend yield	—	2.9%	2.4%
Expected volatility	—	29.8%	29.0%

*There were no options granted during the year ended December 31, 2018.

The following assumptions were used to value the ESPP shares:

	Years Ended December 31,		
	2018	2017	2016
Expected life (years)	2.0	2.0	2.0
Risk-free interest rate	2.2 - 2.7%	1.2 - 1.3%	0.5 - 0.8%
Dividend yield	3.6 - 3.9%	2.0 - 2.5%	2.4 - 3.0%
Expected volatility	39.4 - 41.7%	28.3 - 30.8%	30.0%

For the years ended December 31, 2018, 2017 and 2016, an aggregate of 306,000, 164,000 and 89,000 common shares, respectively, were purchased pursuant to the ESPP.

Modifications

From time to time, the Company enters into consulting agreements with its departing employees. Some of these agreements may include continued vesting of the departing employees' stock awards and an extension of the exercise period from the standard 90 days from employment termination date to the termination of the consulting agreement. In 2017, there was one modification with the impact on the Company's financial statements not deemed to be material. There were no modifications in 2018 and 2016, respectively.

NOTE 14 – INCOME TAXES

The components of total income (loss) before taxes from continuing operations are as follows (in thousands):

	Years Ended December 31,		
	2018	2017	2016
U.S.	$ 16,684	$ 8	$ 90,154
Foreign	(9,774)	(58,351)	561
Total income (loss) before taxes from continuing operations	$ 6,910	$ (58,343)	$ 90,715

The provision for (benefit from) income taxes consisted of the following (in thousands):

	Years Ended December 31,		
	2018	2017	2016
Current:			
U.S. federal	$ 290	$ (79)	$ 9,564
Foreign	22,668	16,871	22,552
State and local	10	77	8
Total current	22,968	16,869	32,124
Deferred:			
U.S. federal	(10,766)	(8,390)	2,365
Foreign	(3,191)	(10,463)	392
State and local	(338)	199	(255)
Total deferred	(14,295)	(18,654)	2,502
Provision for (benefit from) income taxes	$ 8,673	$ (1,785)	$ 34,626

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and the amounts for income tax purposes.

Significant components of the Company's deferred tax assets and liabilities are as follows (in thousands):

	December 31,	
	2018	2017
Deferred tax assets		
Net operating losses	$ 10,368	$ 17,301
Research tax credits	14,717	15,433
Foreign tax credits	27,092	12,479
Expenses not currently deductible	15,021	13,031
Basis difference in fixed and intangible assets	12,061	3,200
Gross deferred tax assets	79,259	61,444
Valuation allowance	(41,942)	(32,032)
Net deferred tax assets	37,317	29,412
Deferred tax liabilities		
Revenue recognition	(63,367)	—
Acquired intangible assets, domestic	(27,323)	(34,408)
Acquired intangible assets, foreign	(7,944)	(4,903)
Unremitted earnings of foreign subsidiaries	—	(30)
Net deferred tax liabilities	$ (61,317)	$ (9,929)

At December 31, 2018 and 2017, the Company had a valuation allowance of $41.9 million and $32.0 million, respectively, related to federal, state, and foreign tax attributes that the Company believes will not be realizable on a more-likely-than-not basis. The $9.9 million increase from the prior year is primarily comprised of $21.1 million attributable to additional valuation allowance recorded against tax credits primarily offset by the utilization of $11.2 million in tax credit carryforwards in the current year. The need for a valuation allowance requires an assessment of both positive and negative evidence when determining whether it is more-likely-than-not that deferred tax assets are recoverable. Such assessment is required on a jurisdiction-by-jurisdiction basis. In making such assessment, significant weight is given to evidence that can be objectively verified. After considering both negative and positive evidence to assess the recoverability of the Company's net deferred tax assets at the end of 2018, management determined that it was more-likely-than-not that the Company would not realize certain federal, state and foreign deferred tax assets given the substantial amount of tax attributes that will remain unutilized to offset forecasted future tax liabilities. The Company will continue to monitor the likelihood that it will be able to recover the deferred tax assets in the future, including those for which a valuation allowance is still recorded.

As of December 31, 2018, the Company had federal net operating loss carryforwards of approximately $10.9 million and state net operating loss carryforwards of approximately $51.4 million. Substantially all of the federal net operating loss carryforwards are carried over from acquired entities, DTS in 2016 and Ziptronix in 2015. The state net operating loss carryforwards are carried over from acquired entities, DTS in 2016, Ziptronix in 2015, and Siimpel Corporation in 2010. The federal net operating loss carryforwards, if not utilized, will begin to expire on various dates beginning in 2026, and will continue to expire through 2031. The state net operating loss carryforwards, if not utilized, will begin to expire on various dates beginning in 2020, and will continue to expire through 2036.

In addition, the Company has research tax credit carryforwards of approximately $9.7 million for federal purposes, a portion of which was generated in the current year and the remainder carried over from prior years. The federal research tax credit will start to expire in 2019 and will continue to expire through 2038. The Company also has research tax credit carryforwards of approximately $14.8 million for state purposes and $0.6 million for foreign purposes, which do not expire. The Company has $15.3 million of foreign tax credit carryforwards which will begin to expire in 2019 and will continue to expire through 2027. Under the provisions of the Internal Revenue Code, substantial ownership changes may limit the amount of net operating loss and tax credit carryforwards that can be utilized annually in the future to offset taxable income. In addition, for losses generated after December 31, 2017, the Tax Act modified the maximum deduction of net operating loss, eliminated carryback, and provided an indefinite carryforward.

A reconciliation of the statutory U.S. federal income tax rate to the Company's effective tax rate is as follows:

	Years Ended December 31,		
	2018	2017	2016
U.S. federal statutory rate	$ 1,451	$ (20,420)	$ 31,750
State, net of federal benefit	59	49	(444)
Stock-based compensation expense	3,883	1,706	1,802
Executive compensation limitation	1,538	—	—
Tax exempt interest	—	—	(179)
Research tax credit	248	(1,851)	(1,074)
Foreign withholding tax	33,063	14,719	22,401
Transaction costs	—	—	2,170
Foreign tax rate differential	474	12,112	346
Foreign tax credit	(33,554)	(13,343)	(21,295)
Change in valuation allowance	7,721	13,497	—
U.S. tax reform	(6,333)	(7,868)	—
Others	123	(386)	(851)
Total	$ 8,673	$ (1,785)	$ 34,626

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (Tax Act) was signed into law. The Tax Act introduced a broad range of tax reform measures that significantly changed the federal income tax laws. As of December 31, 2017, the Company recorded a provisional tax expense in the Statement of Operations of approximately $5.6 million, comprised of approximately $13.5 million tax expense from recording additional valuation allowance against federal tax credits due to certain provisions of the Tax Act, offset by approximately $7.9 million of tax benefit from the remeasurement of U.S. deferred taxes using the 21% tax rate at which the Company expects them to reverse in the future. The one-time transition tax on post-1986 foreign unremitted earnings did not have a material impact on the Company's effective tax rate. In accordance with Staff Accounting Bulletin ("SAB") No. 118, the Company has completed its accounting related to tax reform in the fourth quarter of 2018 and no material adjustments to the provisional tax expense were required. The Company elected to account for Global Intangible Low-Taxed Income ("GILTI") as a period expense. The Company continues to monitor supplemental legislation and technical interpretations of the tax law that may cause the final impact from the Tax Act to differ from the amounts previously recorded.

At December 31, 2018, the Company asserts that it will not permanently reinvest its foreign earnings outside the U.S. The Company anticipates that the cash from its foreign earnings may be used domestically to fund operations, settle a portion of the outstanding debt obligation, or used for other business needs. The accumulated undistributed earnings generated by its foreign subsidiaries was approximately $96.1 million. Substantially all of these earnings will not be taxable upon repatriation to the United States since under the Tax Act they will be treated as previously taxed income, either from the one-time transition tax or GILTI. The withholding taxes related to the distributable cash of the Company's foreign subsidiaries are not expected to be material.

As of December 31, 2018, unrecognized tax benefits approximated $33.6 million, of which $21.3 million would affect the effective tax rate if recognized. As of December 31, 2017, unrecognized tax benefits approximated $33.5 million, of which $22.2 million would affect the effective tax rate if recognized. The Company does not believe that its unrecognized tax benefits as of December 31, 2018 will significantly increase or decrease within the next twelve months.

The reconciliation of the Company's unrecognized tax benefits for the years ended December 31, 2018, 2017 and 2016 is as follows (in thousands):

	Years Ended December 31,		
	2018	2017	2016
Total unrecognized tax benefits at January 1	$ 33,506	$ 30,088	$ 3,071
Gross increases and decreases due to acquisition of DTS	—	—	27,584
Gross increases and decreases due to tax positions taken in prior periods	(540)	2,457	139
Gross increases and decreases due to tax positions taken in the current period	586	961	264
Gross increases and decreases due to settlements with taxing authorities	—	—	—
Gross increases and decreases due to lapses in applicable statutes of limitations	—	—	(970)
Total unrecognized tax benefits at December 31	$ 33,552	$ 33,506	$ 30,088

It is the Company's policy to classify accrued interest and penalties related to unrecognized tax benefits in the provision for income taxes. For the years ended December 31, 2018, 2017, and 2016, the Company recognized an insignificant amount of interest and penalties related to unrecognized tax benefits. Accrued interest and penalties were $0.9 million and $0.6 million, for the years ended December 31, 2018 and 2017, respectively.

At December 31, 2018, the Company's 2014 through 2017 tax years were open and subject to potential examination in one or more jurisdictions. In addition, in the U.S., any net operating losses or credits that were generated in prior years but not yet fully utilized in a year that is closed under the statute of limitations may also be subject to examination. The Internal Revenue Service is currently examining one of the Company's domestic subsidiaries for tax year 2014. The Company cannot estimate the financial outcome of this examination.

NOTE 15 – COMMITMENTS AND CONTINGENCIES

Lease and Purchase Commitments

The Company leases office and research facilities and office equipment under operating leases which expire at various dates through 2029. The amounts reflected in the table below are for the aggregate future minimum lease payments under non-cancelable facility and equipment operating leases. Under lease agreements that contain escalating rent provisions, lease expense is recorded on a straight-line basis over the lease term. Rent expense for the years ended December 31, 2018, 2017 and 2016 amounted to $7.2 million, $6.4 million and $2.8 million, respectively.

As of December 31, 2018, future minimum lease payments are as follows (in thousands):

	Lease Obligations
2019	$ 6,341
2020	5,292
2021	3,441
2022	3,047
2023	3,142
Thereafter	3,518
	$ 24,781

Under certain contractual arrangements, the Company may be obligated to pay up to approximately $7.7 million over an estimated period of approximately four years if certain milestones are achieved.

Contingencies

At each reporting period, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company is currently unable to predict the final outcome of lawsuits to which it is a party and therefore cannot determine the likelihood of loss nor estimate a range of possible loss. An adverse decision in any of these proceedings could significantly harm the Company's business and consolidated financial position, results of operations or cash flows.

Tessera, Inc. v. Toshiba Corporation, Civil Action No. 5:15-cv-02543-BLF (N.D. Cal.)

On May 12, 2015, Tessera, Inc. filed a complaint against Toshiba Corporation ("Toshiba") in California Superior Court. Tessera, Inc.'s complaint alleges causes of action for breach of contract, breach of the implied covenant of good faith and fair dealing, and declaratory relief, generally alleging that Toshiba underpaid royalties and failed to cooperate with audits conducted pursuant to the parties' license agreement.

On June 8, 2015, Toshiba removed the action to the U.S. District Court for the Northern District of California. On June 18, 2015, Toshiba filed its answer, affirmative defenses, and counterclaims to Tessera, Inc.'s complaint. Toshiba alleges counterclaims for declaratory judgment and breach of the implied warranty of good faith and fair dealing. The counterclaims seek, among other things, judicial determinations about the interpretation of the parties' agreement, termination of the agreement, an accounting of the amount of alleged overpayments by Toshiba, restitution, and damages. On July 10, 2015, Tessera, Inc. filed its answer and affirmative defenses to Toshiba's counterclaims. On March 17, 2016, Tessera, Inc. filed an amended complaint adding a claim for declaratory relief regarding a February 12, 2016 letter sent by Toshiba to Tessera, Inc. purporting to terminate the parties' license agreement. On March 18, 2016, Toshiba filed its amended answer, affirmative defenses, and counterclaims. On April 4, 2016, Tessera, Inc. filed an answer to Toshiba's amended counterclaims.

An initial summary judgment hearing on contract issues took place on September 22, 2016. On November 7, 2016, the Court entered an order granting Toshiba's motion regarding the definition of "TCC," and denying summary judgment on the other issues raised by the parties' cross-motions. On December 6, 2016, Tessera, Inc. filed a motion pursuant to Federal Rule of Civil Procedure 54(b) seeking authorization to appeal the order and for a stay. On March 6, 2017, the Court granted the Rule 54(b) motion. The Court subsequently vacated the trial date and stayed the remainder of the district court proceedings.

On April 4, 2017, Tessera, Inc. filed a notice of appeal to the U.S. Court of Appeals for the Ninth Circuit. The parties completed briefing on November 2, 2017. A hearing for oral argument took place on October 15, 2018. On November 21, 2018, the Ninth Circuit dismissed the appeal for lack of appellate jurisdiction and remanded the case to the district court for further proceedings.

A case management conference is scheduled for March 7, 2019. No trial date has yet been scheduled.

Samsung Electronics Co., Ltd. v. Panasonic Corporation (f/k/a Matsushita Electric Industrial Co.), Ltd., Pannova Semic, LLC, and Tessera Advanced Technologies, Inc. (International Chamber of Commerce)

On May 18, 2018, Samsung Electronics Co., Ltd. ("Samsung") filed a Request for Arbitration against Tessera Advanced Technologies, Inc. ("Tessera"), Panasonic Corporation (f/k/a Matsushita Electric Industrial Co.) ("Panasonic") and Pannova Semic, LLC ("Pannova") with the International Chamber of Commerce. The Request seeks declaratory judgments that Samsung has a license to practice U.S. Patent Nos. 6,954,001, 6,784,557, 6,512,298, and 6,852,616 ("Patents-in-Suit"); damages of at least $15 million for alleged breach of contract; and a declaratory judgment that Panasonic's assignment of the Patents-in-Suit is null and void. The Request further seeks an order requiring reimbursement to Samsung of all expenses, including attorneys' fees, incurred in defending against lawsuits that Tessera or its affiliates filed in various jurisdictions. On June 25, 2018, Tessera and Pannova filed a Response to the Request for Arbitration, objecting to the jurisdiction of the Tribunal and denying the merits of Samsung's claims.

In December 2018, the parties reached a global settlement and jointly requested that the arbitration tribunal terminate the arbitration. On December 22, 2018, the tribunal confirmed termination of the arbitration. This matter is now concluded.

Other Litigation Matters

The Company and its subsidiaries are involved in litigation matters and claims in the normal course of business. In the past, the Company and its subsidiaries have litigated to enforce their respective patents and other intellectual property rights, to enforce the terms of license agreements, to protect trade secrets, to determine the validity and scope of the proprietary rights of others and to defend themselves or their customers against claims of infringement or invalidity. The Company expects to be involved, either directly or through its subsidiaries, in similar legal proceedings in the future, including proceedings regarding infringement of its patents, and proceedings to ensure proper and full payment of royalties by customers under the terms of its license agreements.

The existing and any future legal actions may harm the Company's business. For example, an adverse decision in any of these legal actions could result in a loss of the Company's proprietary rights; reduce or limit the value of the Company's licensed technology; negatively impact the Company's stock price, its business, consolidated financial position, results of operations, royalties, billings, or cash flows; subject the Company to significant liabilities; or require the Company to seek licenses from others. Furthermore, legal actions could cause an existing customer or strategic partner to cease making royalty or other payments to the Company, or to challenge the validity and enforceability of patents owned by the Company's subsidiaries or the scope of license agreements with the Company's subsidiaries, and could significantly damage the Company's relationship with such customer or strategic partner and, as a result, prevent the adoption of the Company's other technologies by such customer or strategic partner. Litigation could also severely disrupt or shut down the business operations of customers or strategic partners of the Company's subsidiaries, which in turn would significantly harm ongoing relations with them and cause the Company to lose royalty revenue.

The costs associated with legal proceedings are typically high, relatively unpredictable, and not completely within the Company's control. These costs may be materially higher than expected, which could adversely affect the Company's operating results and lead to volatility in the price of its common stock. Whether or not determined in the Company's favor or ultimately settled, litigation diverts managerial, technical, legal, and financial resources from the Company's business operations.

NOTE 16 – SEGMENT AND GEOGRAPHIC INFORMATION

The Company reports its financial results within two reportable segments: (1) Product Licensing and (2) Semiconductor and IP Licensing. There are certain corporate overhead costs that are not allocated to these reportable segments because these operating amounts are not considered in evaluating the operating performance of the Company's business segments.

The Chief Executive Officer is also the Chief Operating Decision Maker ("CODM") as defined by the authoritative guidance on segment reporting.

The Product Licensing segment, including the Company's DTS and FotoNation subsidiaries, licenses its technologies and intellectual property related to audio, digital radio and imaging solutions under the DTS, FotoNation, HD Radio, and IMAX Enhanced brands. The Product Licensing solutions typically include the delivery of software or hardware-based solutions, combined with various other intellectual property, including know how, patents, trademarks, and copyrights. Product Licensing represents revenue derived primarily from the consumer electronics market and related applications servicing the home, automotive, and mobile markets.

The Semiconductor and IP Licensing segment develops and licenses semiconductor technologies and IP to manufacturers, foundries, subcontract assemblers and others. The segment includes revenue generated from the technology and IP portfolios of Tessera, Inc., Invensas and Invensas Bonding Technologies, Inc. (formally Ziptronix, Inc.). Tessera, Inc. pioneered chip-scale packaging solutions. Invensas develops advanced semiconductor packaging and 3D interconnect solutions, including wafer bonding solutions, for applications such as smartphones, tablets, laptops, PCs, data centers and automobiles. The Company expands its technology and IP offerings in this segment through a combination of internal R&D and acquisitions. The Company also provides engineering services to customers in the form of technology demonstrations and technology transfers to assist their evaluation and adoption of the Company's technologies. Through the Company's technology transfer service, the Company provides detailed documentation outlining design guidelines, process specifications, recommended equipment and process parameters as well as hands-on engineering support to assist its licensees in bringing up and qualifying its technologies at their facilities. This service allows licensees to readily leverage the Company's years of experience and expertise in direct and hybrid bonding.

The Company does not identify or allocate assets by reportable segment, nor does the CODM evaluate reportable segments using discrete asset information. Reportable segments do not record inter-segment revenue and accordingly there are none to report. The Company does not allocate other income and expense to reportable segments. Although the CODM uses operating income to evaluate reportable segments, operating costs included in one segment may benefit other segments.

The following table sets forth the Company's segment revenue, operating expenses and operating income (loss) for the years ended December 31, 2018, 2017 and 2016 (in thousands):

	Years Ended December 31,		
	2018	**2017**	**2016**
Revenue:			
Product licensing segment	$ 219,708	$ 167,923	$ 30,499
Semiconductor and IP licensing segment	186,425	205,809	229,066
Total revenue	406,133	373,732	259,565
Operating expenses:			
Product licensing segment	180,727	172,745	25,299
Semiconductor and IP licensing segment	73,519	87,838	72,812
Unallocated operating expenses (1)	127,907	144,649	72,066
Total operating expenses	382,153	405,232	170,177
Operating income (loss):			
Product licensing segment	38,981	(4,822)	5,200
Semiconductor and IP licensing segment	112,906	117,971	156,254
Unallocated operating expenses (1)	(127,907)	(144,649)	(72,066)
Total operating income (loss)	$ 23,980	$ (31,500)	$ 89,388

(1) Unallocated operating expenses consist primarily of selling, general and administrative expenses and stock-based compensation. These expenses are not allocated because these amounts are not considered in evaluating the operating performance of the Company's business segments.

Amortization and depreciation are included in segment operating income (loss) as shown below (in thousands):

	Years Ended December 31,		
	2018	2017	2016
Amortization and depreciation:			
Product licensing segment	$ 93,582	$ 95,823	$ 9,299
Semiconductor and IP licensing segment	21,544	23,308	24,831
Total amortization and depreciation	$ 115,126	$ 119,131	$ 34,130

A significant portion of the Company's revenue is derived from licensees headquartered outside of the U.S., principally in Asia, and it is expected that this revenue will continue to account for a significant portion of total revenues in future periods. The table below lists the geographic revenue from continuing operations for the periods indicated (in thousands):

	Years Ended December 31,					
	2018		2017		2016	
Korea	$ 209,245	51%	$ 50,155	13%	$ 95,170	37%
Japan	88,513	22	81,688	22	6,866	3
U.S.	53,245	13	164,846	44	99,594	38
Europe and Middle East	31,864	8	13,632	4	1,321	1
Taiwan	2,360	1	33,861	9	34,763	13
Other	20,906	5	29,550	8	21,851	8
	$ 406,133	100%	$ 373,732	100%	$ 259,565	100%

For the years ended December 31, 2018, 2017, and 2016, two, two and four customers, respectively, each accounted for 10% or more of total revenue.

As of December 31, 2018, 2017 and 2016 property and equipment, net, by geographical area are presented below (in thousands):

	December 31,		
	2018	2017	2016
U.S.	$ 29,123	$ 32,862	$ 36,891
Europe	1,533	1,019	1,252
Asia and other	381	561	712
Total	$ 31,037	$ 34,442	$ 38,855

NOTE 17 – BENEFIT PLAN

The Company maintains a 401(k) retirement savings plan that allows voluntary contributions by all eligible U.S. employees upon their hire date. Eligible employees may elect to contribute up to the maximum amount allowed under Internal Revenue Service regulations. The Company can make discretionary contributions under the 401(k) plan. During the years ended December 31, 2018, 2017 and 2016, the Company contributed approximately $2.9 million, $2.4 million, and $0.8 million, respectively, to the 401(k) plan.

NOTE 18 – SUBSEQUENT EVENTS

Declaration of a Cash Dividend

On January 30, 2019, the Board declared a cash dividend of $0.20 per share of common stock, payable on March 27, 2019, for the stockholders of record at the close of business on March 13, 2019.

Schedule II. Valuation and Qualifying Accounts for the Years Ended December 31, 2018, 2017 and 2016

	Balance at Beginning of Year	Charged (Credited) to Expenses	Charged (Credited) to Other Accounts	Balance at End of Year
Deferred income tax asset:				
Valuation allowance				
2016	$ 13,852	$ (345)	$ (660)	$ 12,847
2017	$ 12,847	$ 13,925	$ 5,260	$ 32,032
2018	$ 32,032	$ 2,794	$ 7,116	$ 41,942

	Balance at Beginning of Year	Charged (Credited) to Expenses	Charged (Credited) to Other Accounts	Balance at End of Year
Accounts receivable:				
Allowance for doubtful accounts				
2016	$ —	$ —	$ —	$ —
2017	$ —	$ 2,404	$ (1,223)	$ 1,181
2018	$ 1,181	$ 417	$ (819)	$ 779

EXHIBIT INDEX

Exhibit Number	Exhibit Description
2.1*	Agreement and Plan of Merger, dated as of September 19, 2016, among Tessera Technologies, Inc. (referred to herein as the "Predecessor Registrant"), DTS, Inc., the Registrant, Tempe Merger Sub Corporation and Arizona Merger Sub Corporation (incorporated by reference to Exhibit 2.1 to the Current Report on Form 8-K filed by the Predecessor Registrant on September 20, 2016)
3.1	Restated Certificate of Incorporation (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed December 1, 2016, and incorporated herein by reference)
3.2	Certificate of Amendment of the Restated Certificate of Incorporation dated as of February 22, 2017 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed February 27, 2017, and incorporated herein by reference)
3.3	Amended and Restated Bylaws, dated December 1, 2016 (filed as Exhibit 3.2 to the Registrant's Current Report on Form 8-K, filed December 1, 2016, and incorporated herein by reference)
3.4	Amendment to the Amended and Restated Bylaws, dated as of December 6, 2016 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed December 7, 2016, and incorporated herein by reference)
3.5	Amendment to the Amended and Restated Bylaws, dated as of April 27, 2017 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed May 3, 2017, and incorporated herein by reference)
3.6	Amendment to the Amended and Restated Bylaws, effective as of February 1, 2018 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed February 7, 2018, and incorporated herein by reference)
3.7	Amendment to the Amended and Restated Bylaws, effective as of April 27, 2018 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed May 3, 2018, and incorporated herein by reference)
3.8	Amendment to the Amended and Restated Bylaws, effective as of December 15, 2018 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed October 30, 2018, and incorporated herein by reference)
10.1	Form of Indemnification Agreement between the Registrant and each of its directors and executive officers (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed December 7, 2016, and incorporated herein by reference)
10.2+	2017 Performance Bonus Plan for Executive Officers and Key Employees (filed as Appendix A to the Registrant's Definitive Proxy Statement, filed on March 15, 2017 and incorporated herein by reference)
10.3+	Employee Stock Purchase Plan, as amended and restated effective July 31, 2013 (filed as Appendix B to the Definitive Proxy Statement of the Predecessor Registrant, filed April 16, 2013, and incorporated herein by reference)
10.4+	Amended and Restated International Employee Stock Purchase Plan (filed as Appendix B to the Registrant's Definitive Proxy Statement, filed March 15, 2017, and incorporated herein by reference)
10.5+	Sixth Amended and Restated 2003 Equity Incentive Plan (filed as Appendix A to the Predecessor Registrant's Definitive Proxy Statement, filed March 18, 2015, and incorporated herein by reference)
10.6+	First Amendment to Sixth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.1 to the Predecessor Registrant's Quarterly Report on Form 10-Q, filed May 2, 2016, and incorporated herein by reference)
10.7+	Form of Stock Option Agreement for the Tessera Technologies, Inc. Fourth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.2 to the Predecessor Registrant's Registration Statement on Form S-8, filed June 13, 2008, and incorporated herein by reference)
10.8+	Form of Stock Option Agreement for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.2 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.9+	Form of Stock Option Agreement (Board) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.3 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.10+	Form of Stock Option Agreement (Romania) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.4 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)

10.11+	Form of Stock Option Agreement (International) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.2 to the Predecessor Registrant's Quarterly Report on Form 10-Q, filed November 4, 2010, and incorporated herein by reference)
10.12+	Form of Stock Option Agreement for the Tessera Technologies, Inc. Sixth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.2 to the Predecessor Registrant's Quarterly Report on Form 10-Q, filed August 5, 2015, and incorporated herein by reference)
10.13+	Form of Restricted Stock Agreement for the Tessera Technologies, Inc. Fourth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.3 to the Predecessor Registrant's Registration Statement on Form S-8, filed June 13, 2008, and incorporated herein by reference)
10.14+	Form of Restricted Stock Agreement for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.5 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.15+	Form of Restricted Stock Agreement (Israel) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.6 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.16+	Form of Restricted Stock Agreement (Romania) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.7 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.17+	Form of Restricted Stock Agreement for the Tessera Technologies, Inc. Sixth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.3 to the Predecessor Registrant's Quarterly Report on Form 10-Q, filed August 5, 2015, and incorporated herein by reference)
10.18+	Form of Deferred Stock Agreement for the Tessera Technologies, Inc. Fourth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.4 to the Predecessor Registrant's Registration Statement on Form S-8, filed June 13, 2008, and incorporated herein by reference)
10.19+	Form of Deferred Stock Agreement for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.8 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.20+	Form of Deferred Stock Agreement (Performance Vesting) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.9 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.21+	Form of Deferred Stock Agreement (Ireland) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.10 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.22+	Form of Deferred Stock Agreement (Israel) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.11 to the Predecessor Registrant's Registration Statement on Form S-8, filed August 6, 2010, and incorporated herein by reference)
10.23+	Form of Deferred Stock Agreement (International) for the Tessera Technologies, Inc. Fifth Amended and Restated 2003 Equity Incentive Plan (filed as Exhibit 10.1 to the Predecessor Registrant's Quarterly Report on Form 10-Q, filed November 4, 2010, and incorporated herein by reference)
10.24+	Employment and Severance Agreement, dated April 28, 2017, by and between the Registrant and Jon Kirchner (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed August 2, 2017, and incorporated herein by reference)
10.25+	Employment Transition and Consulting Agreement, dated May 3, 2017, by and between the Registrant and Thomas Lacey (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q, filed August 2, 2017, and incorporated herein by reference)
10.26+	Amended and Restated Severance Agreement, dated February 22, 2017, by and between the Registrant and Robert Andersen (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed February 27, 2017 and incorporated herein by reference)
10.27+	Amended and Restated Change in Control Severance Agreement, dated February 22, 2017, by and between the Registrant and Robert Andersen (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed February 27, 2017, and incorporated herein by reference)
10.28+	Severance Agreement, dated December 19, 2016, by and between DTS, Inc. and Geir Skaaden (filed as Exhibit 10.32 to the Registrant's Annual Report on Form 10-K, filed February 27, 2017, and incorporated herein by reference)

10.29+	Change in Control Severance Agreement, dated December 19, 2016, by and between DTS, Inc. and Geir Skaaden (filed as Exhibit 10.33 to the Registrant's Annual Report on Form 10-K, filed February 27, 2017, and incorporated herein by reference)
10.30+	Severance Agreement, dated October 16, 2017, by and between the Registrant and Murali Dharan
10.31+	Change in Control Severance Agreement, dated October 16, 2017, by and between the Registrant and Murali Dharan
10.32+	Non-Employee Director Compensation Policy (filed as Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q, filed August 2, 2017, and incorporated herein by reference)
10.33	Credit Agreement, dated as of December 1, 2016, among Tessera Holding Corporation (f/k/a Tempe Holdco Corporation), the lenders party thereto and Royal Bank of Canada, as administrative agent and collateral agent (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed December 1, 2016, and incorporated herein by reference)
10.34	Amendment No. 1 to Credit Agreement, dated as of January 23, 2018, among the Registrant, the other loan parties thereto, the participating lenders, and Royal Bank of Canada, as administrative agent, collateral agent and fronting bank (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed January 24, 2018, and incorporated herein by reference)
10.35	Guaranty, dated December 1, 2016, by the Registrant's subsidiary guarantors in favor of Royal Bank of Canada, as administrative agent (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed December 1, 2016, and incorporated herein by reference)
10.36	Security Agreement, dated December 1, 2016, among the Registrant, Royal Bank of Canada, as collateral agent, and the other pledgors party thereto (filed as Exhibit 10.3 to the Registrant's Current Report on Form 8-K, filed December 1, 2016, and incorporated herein by reference)
10.37+	DTS, Inc. 2014 New Employee Incentive Plan (filed as Exhibit 10.1 to the Current Report on Form 8-K of DTS, Inc., filed August 20, 2014, and incorporated herein by reference)
10.38+	Amendment No. 1 to DTS, Inc. 2014 New Employee Incentive Plan (filed as Exhibit 99.3 to Registration Statement on Form S-8 of DTS, Inc., filed August 10, 2015, and incorporated herein by reference)
10.39+	Amendment No. 2 to DTS, Inc. 2014 New Employee Incentive Plan (filed as Exhibit 99.3 to Registration Statement on Form S-8 of DTS, Inc., filed November 9, 2015, and incorporated herein by reference)
10.40+	DTS, Inc. 2013 Employee Stock Purchase Plan (filed as Exhibit 99.1 to Registration Statement on Form S-8 of DTS, Inc., filed August 16, 2013, and incorporated herein by reference)
10.41+	DTS, Inc. 2013 Foreign Subsidiary Employee Stock Purchase Plan (filed as Exhibit 99.2 to Registration Statement on Form S-8 of DTS, Inc., filed August 16, 2013, and incorporated herein by reference)
10.42+	DTS, Inc. 2012 Equity Incentive Plan and Amendment No. 1 (filed as Appendix A to Definitive Proxy Statement on Schedule 14A of DTS, Inc., filed April 14, 2015, and incorporated herein by reference)
10.43+	SRS Labs, Inc. 2006 Stock Incentive Plan, as amended and restated on August 9, 2012 (filed as Exhibit 4.4 to Registration Statement on Form S-8 of DTS, Inc., filed August 13, 2012, and incorporated herein by reference)
14.1	Code of Business Conduct and Ethics, dated December 1, 2016 (filed as Exhibit 14.1 to the Registrant's Current Report on Form 8-K, filed December 1, 2016, and incorporated herein by reference)
21.1	List of subsidiaries
23.1	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm
24.1	Power of Attorney (see signature page to this Annual Report on Form 10-K)
31.1	Certification of the Chief Executive Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934
31.2	Certification of the Chief Financial Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934
32.1	Certification of the Chief Executive Officer and Chief Financial Officer pursuant to Rule 13a-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema 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 a management contract or compensatory plan or arrangement.

* The exhibits and schedules to this agreement have been omitted in reliance on Item 601(b)(2) of Regulation S-K promulgated by the SEC, and a copy thereof will be furnished supplementally to the SEC upon its request. Readers are cautioned that the representations and warranties set forth in this agreement are qualified by those schedules, and should not be relied upon as accurate or complete without reference to those schedules

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, as amended (the "Exchange Act"), the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Dated: February 20, 2019

Xperi Corporation

By: /s/ Jon Kirchner
Jon Kirchner
Chief Executive Officer

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Jon Kirchner and Robert Andersen, and each of them, with full power of substitution and resubstitution and full power to act without the other, as his true and lawful attorney-in-fact and agent to act in his 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 amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other 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 or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

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

Signature	Title	Date
/s/ Jon Kirchner **Jon Kirchner**	Chief Executive Officer and Director (Principal Executive Officer)	February 20, 2019
/s/ Robert J. Andersen **Robert J. Andersen**	Executive Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	February 20, 2019
/s/ Richard S. Hill **Richard S. Hill**	Chairman of the Board of Directors	February 20, 2019
/s/ Darcy Antonellis **Darcy Antonellis**	Director	February 20, 2019
/s/ Dave Habiger **Dave Habiger**	Director	February 20, 2019
/s/ V. Sue Molina **V. Sue Molina**	Director	February 20, 2019
/s/ George A. Riedel **George A. Riedel**	Director	February 20, 2019
/s/ Christopher A. Seams **Christopher A. Seams**	Director	February 20, 2019

SEVERANCE AGREEMENT

This Severance Agreement ("***Agreement***") is made by and between Xperi Corporation, a Delaware corporation (the "***Company***"), and Murali Dharan ("***Executive***"), effective as of October 16, 2017 (such date, the "***Effective Date***"). For purposes of this Agreement, the "***Company***" shall mean the Company and its subsidiaries.

The parties agree as follows:

1. Definitions. For purposes of this Agreement, the following terms shall have the following meanings:

(a)"***Board***" shall mean the Board of Directors of the Company.

(b)"***Cause***" shall mean any of the following: (i) Executive's gross negligence or willful misconduct in the performance of his or her duties to the Company and its affiliates; (ii) Executive's willful and habitual neglect of or failure to perform Executive's duties of consulting or employment (which neglect or failure is not caused by Executive's illness or mental or physical disability), which neglect or failure is not cured within thirty (30) days after written notice thereof is received by Executive (it being agreed that a failure of the Company and its affiliates to meet performance objectives shall not, alone, constitute a failure by Executive to perform his duties); (iii) Executive's commission of any material act of fraud, dishonesty or financial or accounting impropriety with respect to the Company and its affiliates which results in a personal benefit to Executive; (iv) Executive's failure to cooperate with the Company and its affiliates in any investigation or formal proceeding initiated by a governmental authority or otherwise approved by the Board or the Audit Committee of the Board (which failure is not caused by Executive's illness or mental or physical disability), which failure is not cured within thirty (30) days after written notice thereof is received by Executive; (v) Executive's conviction of or plea of guilty or *nolo contendere* to felony criminal conduct (other than moving vehicle violations); (vi) Executive's material violation of the Company's Confidentiality and Proprietary Rights Agreement (as defined below) or similar agreement that Executive has entered into with the Company and its affiliates; or (vii) Executive's material breach of any obligation or duty under this Agreement or material violation of any written employment or other Company policies that have previously been furnished to Executive, which breach or violation is not cured within thirty (30) days after written notice thereof is received by Executive, if such breach or violation is capable of being cured.

(c) "***Code***" means the Internal Revenue Code of 1986, as amended, and the Treasury Regulations and other interpretive guidance thereunder.

(d) "***Good Reason***" shall mean the occurrence of any of the following events or conditions without Executive's written consent:

(i)a material diminution in Executive's authority, duties or responsibilities;

(ii)a material diminution in Executive's base compensation or target annual bonus opportunity, unless such reduction is imposed across-the-board to senior management of the Company (and Executive and the Company agree that without limiting any argument that a lesser diminution is material, any diminution of ten percent (10%) or more measured against Executive's base compensation and target bonus opportunity as in effect on the Effective Date shall be deemed material for purposes of this clause (ii));

(iii) a material change in the geographic location at which Executive must perform his or her duties (and the Company and Executive acknowledge and agree that a change in the geographic location at which Executive must perform his or her duties by more than forty-five (45) miles shall constitute a material change for purposes of this Agreement); or

(iv) any other action or inaction that constitutes a material breach by the Company or any successor or affiliate of its obligations to Executive under this Agreement.

Executive must provide written notice to the Company of the occurrence of any of the foregoing events or conditions without Executive's written consent within ninety (90) days of Executive learning of the occurrence of such event. The Company or any successor or affiliate shall have a period of thirty (30) days to cure such event or condition after receipt of written notice of such event from Executive. Any voluntary Separation from Service for "Good Reason" following such thirty (30) day cure period must occur no later than the date that is six (6) months following the occurrence of one of the foregoing events or conditions without Executive's written consent.

(e) "***Permanent Disability***" means Executive's inability to perform the essential functions of his or her position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(f) "***Separation from Service***" means a "separation from service" within the meaning of Section 409A of the Code.

2. Term. The term of this Agreement ("the "***Term***") shall continue until the earlier of (i) the second anniversary of the Effective Date, or (ii) the date on which all payments or benefits required to be made or provided hereunder have been made or provided in their entirety Notwithstanding the foregoing, the obligation of the Company to make payments or provide benefits pursuant to this Agreement to which Executive has acquired a right in accordance with the applicable provisions of this Agreement prior to the expiration of the Term shall survive the termination of this Agreement until such payments and benefits have been provided in full.

3. Severance.

(a) If Executive has a Separation from Service as a result of Executive's discharge by the Company without Cause or by reason of Executive's resignation for Good Reason, Executive shall be entitled to receive, in lieu of any severance benefits to which Executive may otherwise be entitled under any severance plan or program of the Company, the benefits provided below, which, with respect to clause (ii), will be payable in a lump sum on the day that is sixty (60) days following the date of Executive's Separation from Service:

(i)The Company shall pay to Executive his or her fully earned but unpaid base salary, when due, through the date of Executive's Separation from Service at the rate then in effect, reimbursement of business expenses incurred prior to the date of Executive's Separation from Service and properly submitted in accordance with Company policy, plus all other benefits, if any, under any Company group retirement plan, nonqualified deferred compensation plan, equity award plan or agreement, health benefits plan or other Company group benefit plan to which Executive may be entitled pursuant to the terms of such plans or agreements at the time of Executive's Separation from Service (the "***Accrued Obligations***");

(ii) Subject to Section 3(c) and Executive's continued compliance with Section 4, Executive shall be entitled to receive severance pay in an amount equal to one-hundred percent (100%) multiplied by the sum of (x) Executive's annual base salary as in effect immediately prior to the date of Executive's Separation from Service, plus (y) Executive's target annual bonus for the calendar year in which Executive's Separation from Service occurs (which bonus shall be prorated for the portion of the calendar year that has elapsed prior to the date of Executive's Separation from Service); and

(iii) Subject to Section 3(c) and Executive's continued compliance with Section 4, for the period beginning on the date of Executive's Separation from Service and ending on the date which is twelve (12) full months following the date of Executive's Separation from Service (or, if earlier, the date on which the applicable continuation period under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("***COBRA***") expires) (the "***COBRA Coverage Period***"), the Company shall continue to provide Executive and his or her eligible dependents who were covered under the Company's health insurance plans as of the date of Executive's Separation from Service with health (including medical and dental) insurance benefits substantially similar to those provided to Executive and his or her dependents immediately prior to the date of such Separation from Service. If any of the Company's health benefits are self-funded as of the date of Executive's Separation from Service, or if the Company cannot provide the foregoing benefits in a manner that is exempt from or otherwise compliant with applicable law or the provision of such benefits may result in the Company incurring penalties under applicable law (including, without limitation, Section 409A of the Code and Section 2716 of the Public Health Service Act), instead of providing continued health insurance benefits as set forth above, the Company shall instead pay to Executive an amount equal to the monthly premium payment for Executive and his or her eligible dependents who were covered under the Company's health plans as of the date of Executive's Separation from Service (calculated by reference to the premium as of the date of Separation from Service) as currently taxable compensation, in substantially equal monthly installments over the COBRA Coverage Period (or the remaining portion thereof).

(b) Other Terminations. If Executive's employment is terminated by the Company for Cause, by Executive without Good Reason, or as a result of Executive's death or Permanent Disability, the Company shall not have any other or further obligations to Executive under this Agreement (including any financial obligations) except that Executive shall be entitled to receive the Accrued Obligations. The foregoing shall be in addition to, and not in lieu of, any and all other rights and remedies which may be available to the Company under the circumstances, whether at law or in equity.

(c) Release. As a condition to Executive's receipt of any post-termination benefits pursuant to Section 3(a) above (other than the Accrued Obligations), Executive shall execute and not revoke a general release of all claims in favor of the Company (the "***Release***") in the form substantially similar to that attached hereto as Exhibit A (and any applicable revocation period applicable to such Release shall have expired) within the sixty (60) day period following the date of Executive's Separation from Service.

(d) Exclusive Remedy. Except as otherwise expressly required by law (e.g., COBRA) or as specifically provided herein, all of Executive's rights to salary, severance, benefits, bonuses and other amounts hereunder (if any) accruing after the termination of Executive's employment shall cease upon such termination. In the event of a termination of Executive's employment with the Company, and except in the event of violation of applicable law by the Company relating to Executive's employment or the termination thereof, Executive's sole remedy shall be to receive the payments and benefits described in this Section 3.

(e) No Mitigation. Executive shall not be required to mitigate the amount of any payment provided for in this Section 3 by seeking other employment or otherwise, nor shall the amount of any payment or benefit provided for in this Section 3 be reduced by any compensation earned by Executive as the result of employment by another employer or self-employment or by retirement benefits; *provided*, *however*, that loans, advances or other amounts owed by Executive to the Company and its affiliates may be offset by the Company against amounts payable to Executive under this Section 3.

(f)Return of the Company's Property. If Executive's employment is terminated for any reason, the Company shall have the right, at its option, to require Executive to vacate his or her offices prior to or on the effective date of termination and to cease all activities on the Company's behalf. Upon the termination of his or her employment in any manner, as a condition to Executive's receipt of any post-termination benefits described in this Agreement, Executive shall immediately surrender to the Company all lists, books and records of, or in connection with, the Company's business, and all other property belonging to the Company and its affiliates, it being distinctly understood that all such lists, books and records, and other documents, are the property of the Company and its affiliates. Executive shall deliver to the Company a signed statement certifying compliance with this Section 3(f) prior to the receipt of any post-termination benefits described in this Agreement.

(g) Best Pay Provision.

(i) If any payment or benefit Executive would receive under this Agreement, when combined with any other payment or benefit Executive receives pursuant to the termination of Executive's employment with the Company and its affiliates ("***Payment***"), would (A) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (B) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then such Payment shall be either (1) the full amount of such Payment or (2) such lesser amount (with cash payments being reduced before stock option compensation) as would result in no portion of the Payment being subject to the Excise Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local employment taxes, income taxes, and the Excise Tax, results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax.

(ii) All determinations required to be made under this Section 3(g), including whether and to what extent the Payments shall be reduced and the assumptions to be utilized in arriving at such determination, shall be made by the nationally recognized certified public accounting firm used by the Company immediately prior to the effective date of the change in control giving rise to the application of this Section 3(g) or, if such firm declines to serve, such other nationally recognized certified public accounting firm as may be designated by the Company (the "***Accounting Firm***"). The Accounting Firm shall provide detailed supporting calculations both to Executive and the Company at such time as is requested by the Company. All fees and expenses of the Accounting Firm shall be borne solely by the Company. Any determination by the Accounting Firm shall be binding upon Executive and the Company. For purposes of making the calculations required by this Section 3(g), the Accounting Firm may make reasonable assumptions and approximations concerning applicable taxes and may rely on reasonable, good-faith interpretations concerning the application of Sections 280G and 4999 of the Code.

4. Confidentiality and Proprietary Rights. Executive and the Company have executed the Company's Confidentiality and Proprietary Rights Agreement, a copy of which is attached to this Agreement as Exhibit B and incorporated herein by reference (the "***Confidentiality and Proprietary Rights Agreement***"). The Company shall be entitled to cease all severance payments and benefits to Executive in the event of his or his material breach of this Section 4. Nothing in this Agreement or in the Confidentiality and Proprietary Rights Agreement shall be deemed to restrict Executive's right to communicate directly with, cooperate with, provide information to, or report possible violations of federal law or regulation to, any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 806 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation, including, but not limited to, the U.S. Securities and Exchange Commission, the U.S. Commodity Futures Trading Commission, or the U.S. Department of Justice.

5. Agreement to Arbitrate. Any dispute, claim or controversy based on, arising out of or relating to Executive's employment or this Agreement shall be settled by final and binding arbitration in San Jose, California, before a single neutral arbitrator in accordance with the Employment Arbitration Rules and Procedures (the "***Rules***") of Judicial Arbitration and Mediation Services ("***JAMS***"), and judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction. The Rules may be

found online at www.jamsadr.com. Arbitration may be compelled pursuant to the California Arbitration Act (Code of Civil Procedure §§ 1280 et seq.). If the parties are unable to agree upon an arbitrator, one shall be appointed by JAMS in accordance with its Rules. Each party shall pay the fees of its own attorneys, the expenses of its witnesses and all other expenses connected with presenting its case; *provided*, *however*, Executive and the Company agree that, to the extent permitted by law, the arbitrator may, in his or her discretion, award reasonable attorneys' fees to the prevailing party; *provided*, *further*, that the prevailing party shall be reimbursed for such fees, costs and expenses within forty-five (45) days following any such award, but in no event later than the last day of the Executive's taxable year following the taxable year in which the fees, costs and expenses were incurred; *provided*, *further*, that the parties' obligations pursuant to this sentence shall terminate on the tenth (10^{th}) anniversary of the date of Executive's termination of employment; *provided*, *however*, that Executive shall retain the right to file administrative charges with or seek relief through any government agency of competent jurisdiction, and to participate in any government investigation, including but not limited to (a) claims for workers' compensation, state disability insurance or unemployment insurance; (b) claims for unpaid wages or waiting time penalties brought before the California Division of Labor Standards Enforcement; *provided*, *however*, that any appeal from an award or from denial of an award of wages and/or waiting time penalties shall be arbitrated pursuant to the terms of this Agreement; and (c) claims for administrative relief from the United States Equal Employment Opportunity Commission and/or the California Department of Fair Employment and Housing (or any similar agency in any applicable jurisdiction other than California); *provided*, *further*, that Executive shall not be entitled to obtain any monetary relief through such agencies other than workers' compensation benefits or unemployment insurance benefits. Other costs of the arbitration, including the cost of any record or transcripts of the arbitration, JAMS' administrative fees, the fee of the arbitrator, and all other fees and costs, shall be borne by the Company. This Section 5 is intended to be the exclusive method for resolving any and all claims by the parties against each other for payment of damages under this Agreement or relating to Executive's employment; *provided*, *however*, that neither this Agreement nor the submission to arbitration shall limit the parties' right to seek provisional relief, including without limitation injunctive relief, in any court of competent jurisdiction pursuant to California Code of Civil Procedure § 1281.8 or any similar statute of an applicable jurisdiction. Seeking any such relief shall not be deemed to be a waiver of such party's right to compel arbitration. Both Executive and the Company expressly waive their right to a jury trial.

6. At-Will Employment Relationship. Executive's employment with the Company is at-will and not for any specified period and may be terminated at any time, with or without Cause or advance notice, by either Executive or the Company. Any change to the at-will employment relationship must be by specific, written agreement signed by Executive and an authorized representative of the Company. Nothing in this Agreement is intended to or should be construed to contradict, modify or alter this at-will relationship.

7. General Provisions.

7.1 Successors and Assigns. The rights of the Company under this Agreement may, without the consent of Executive, be assigned by the Company, in its sole and unfettered discretion, to 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. The Company will require any successor (whether direct or indirect, by purchase, merger or otherwise) to all or substantially all of the business or assets of the Company expressly to assume and to agree to perform this Agreement in the same manner and to the same extent that the Company would be required to perform it if no such succession had taken place; *provided*, *however*, that no such assumption shall relieve the Company of its obligations hereunder; *provided*, *further*, that the failure of any such successor to so assume this Agreement shall constitute a material breach of this Agreement. As used in this Agreement, the "***Company***" shall mean the Company as hereinbefore defined and any successor to its business and/or assets as aforesaid which assumes and agrees to perform this Agreement by operation of law or otherwise. Executive shall not be entitled to assign any of Executive's rights or obligations under this Agreement.

This Agreement shall inure to the benefit of and be enforceable by Executive's personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

7.2 Severability. In the event any provision of this Agreement is found to be unenforceable by an arbitrator or court of competent jurisdiction, such provision shall be deemed modified to the extent necessary to allow enforceability of the provision as so limited, it being intended that the parties shall receive the benefit contemplated herein to the fullest extent permitted by law. If a deemed modification is not satisfactory in the judgment of such arbitrator or court, the unenforceable provision shall be deemed deleted, and the validity and enforceability of the remaining provisions shall not be affected thereby.

7.3 Interpretation; Construction. The headings set forth in this Agreement are for convenience only and shall not be used in interpreting this Agreement. This Agreement has been drafted by legal counsel representing the Company, but Executive has participated in the negotiation of its terms. Furthermore, Executive acknowledges that Executive has had an opportunity to review and revise the Agreement and have it reviewed by legal counsel, if desired, and, therefore, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement. Either party's failure to enforce any provision of this Agreement shall not in any way be construed as a waiver of any such provision, or prevent that party thereafter from enforcing each and every other provision of this Agreement.

7.4 Governing Law and Venue. This Agreement will be governed by and construed in accordance with the laws of the United States and the State of California applicable to contracts made and to be performed wholly within such State, and without regard to the conflicts of laws principles thereof. Any suit brought hereon shall be brought in the state or federal courts sitting in Santa Clara County, California, the Parties hereby waiving any claim or defense that such forum is not convenient or proper. Each party hereby agrees that any such court shall have in personam jurisdiction over it and consents to service of process in any manner authorized by California law.

7.5 Notices. Any notice required or permitted by this Agreement shall be in writing and shall be delivered as follows with notice deemed given as indicated: (a) by personal delivery when delivered personally; (b) by overnight courier upon written verification of receipt; (c) by telecopy or facsimile transmission upon acknowledgment of receipt of electronic transmission; or (d) by certified or registered mail, return receipt requested, upon verification of receipt. Notice shall be sent to Executive at the address set forth below and to the Company at its principal place of business, or such other address as either party may specify in writing.

7.6 Survival. Sections 1 ("Definitions"), 3 ("Severance"), 4 ("Confidentiality and Proprietary Rights"), 5 ("Agreement to Arbitrate") and 7 ("General Provisions") of this Agreement shall survive termination of Executive's employment by the Company.

7.7 Entire Agreement. This Agreement and the Confidentiality and Proprietary Rights Agreement incorporated herein by reference together constitute the entire agreement between the parties in respect of the subject matter contained herein and therein and supersede all prior or simultaneous representations, discussions, negotiations, and agreements, whether written or oral, including, without limitation, the Existing Agreement. This Agreement may be amended or modified only with the written consent of Executive and an authorized representative of the Company. No oral waiver, amendment or modification will be effective under any circumstances whatsoever. Notwithstanding the foregoing or anything herein to the contrary, although severance provided under this Agreement may offset severance provided under the Executive's Change in Control Severance Agreement made by and between the Company and the Executive effective as of October 16, 2017 (the "***CIC Severance Agreement***") (as specified in Section 3(a)(v) thereof), the CIC Severance Agreement is outside the scope of the foregoing integration provision and shall continue in full force and effect.

7.8 Code Section 409A.

(a) To the extent applicable, this Agreement shall be interpreted in accordance with Code Section 409A and Department of Treasury regulations and other interpretive guidance issued thereunder. Each series of installment payments made under this Agreement is hereby designated as a series of "separate payments" within the meaning of Section 409A of the Code.

(b)If the Executive is a "specified employee" (as defined in Section 409A of the Code), as determined by the Company in accordance with Section 409A of the Code, on the date of the Executive's Separation from Service, to the extent that the payments or benefits under this Agreement are subject to Section 409A of the Code and the delayed payment or distribution of all or any portion of such amounts to which Executive is entitled under this Agreement is required in order to avoid a prohibited distribution under Section 409A(a)(2)(B)(i) of the Code, then such portion deferred pursuant to this Section 7.8(b) shall be paid or distributed to Executive in a lump sum on the earlier of (i) the date that is six (6)-months following Executive's Separation from Service, (ii) the date of Executive's death or (iii) the earliest date as is permitted under Section 409A of the Code. Any remaining payments due under the Agreement shall be paid as otherwise provided herein.

(c)Notwithstanding anything to the contrary in this Agreement, in-kind benefits and reimbursements provided under this Agreement during any tax year of Executive shall not affect in-kind benefits or reimbursements to be provided in any other tax year of Executive and are not subject to liquidation or exchange for another benefit. Notwithstanding anything to the contrary in this Agreement, reimbursement requests must be timely submitted by Executive and, if timely submitted, reimbursement payments shall be made to Executive as soon as administratively practicable following such submission, but in no event later than the last day of Executive's taxable year following the taxable year in which the expense was incurred. In no event shall Executive be entitled to any reimbursement payments after the last day of Executive's taxable year following the taxable year in which the expense was incurred. This section shall only apply to in-kind benefits and reimbursements that would result in taxable compensation income to Executive.

7.9 Consultation with Legal and Financial Advisors. By executing this Agreement, Executive acknowledges that this Agreement confers significant legal rights, and may also involve the waiver of rights under other agreements; that the Company has encouraged Executive to consult with Executive's personal legal and financial advisors; and that Executive has had adequate time to consult with Executive's advisors before executing this Agreement.

7.10 Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

(Signature Page Follows)

THE PARTIES TO THIS AGREEMENT HAVE READ THE FOREGOING AGREEMENT AND FULLY UNDERSTAND EACH AND EVERY PROVISION CONTAINED HEREIN. WHEREFORE, THE PARTIES HAVE EXECUTED THIS AGREEMENT ON THE DATES SHOWN BELOW.

XPERI CORPORATION

Dated: By:

Name: Kris Graves
Title: Chief Human Resources Officer

EXECUTIVE

Dated:

Print Name:

Address:

-

EXHIBIT A

GENERAL RELEASE OF CLAIMS

[*The language in this Release may change based on legal developments and evolving best practices; provided, however, that no new post-termination covenants shall be imposed on Executive; this form is provided as an example of what will be included in the final Release document.*]

This General Release of Claims (“***Release***”) is entered into as of this _____ day of ________, ____, between __________ (“***Executive***”), and Xperi Corporation, a Delaware corporation (the “***Company***”) (collectively referred to herein as the “***Parties***”).

WHEREAS, Executive and the Company are parties to that certain Severance Agreement dated as of _______, ____ (the “***Agreement***”);

WHEREAS, the Parties agree that Executive is entitled to certain severance benefits under the Agreement, subject to Executive’s execution of this Release; and

WHEREAS, the Company and Executive now wish to fully and finally to resolve all matters between them.

NOW, THEREFORE, in consideration of, and subject to, the severance benefits payable to Executive pursuant to the Agreement, the adequacy of which is hereby acknowledged by Executive, and which Executive acknowledges that he or she would not otherwise be entitled to receive, Executive and the Company hereby agree as follows:

1. General Release of Claims by Executive.

(a)Executive, on behalf of himself or herself and his or her executors, heirs, administrators, representatives and assigns, hereby agrees to release and forever discharge the Company and all predecessors, successors and their respective parent corporations, affiliates, related, and/or subsidiary entities, and all of their past and present investors, directors, shareholders, officers, general or limited partners, employees, attorneys, agents and representatives, and the employee benefit plans in which Executive is or has been a participant by virtue of his or her employment with or service to the Company (collectively, the “***Company Releasees***”), from any and all claims, debts, demands, accounts, judgments, rights, causes of action, equitable relief, damages, costs, charges, complaints, obligations, promises, agreements, controversies, suits, expenses, compensation, responsibility and liability of every kind and character whatsoever (including attorneys’ fees and costs), whether in law or equity, known or unknown, asserted or unasserted, suspected or unsuspected (collectively, “***Claims***”), which Executive has or may have had against such entities based on any events or circumstances arising or occurring on or prior to the date hereof or on or prior to the date hereof, arising directly or indirectly out of, relating to, or in any other way involving in any manner whatsoever Executive’s employment by or service to the Company or the termination thereof, including any and all claims arising under federal, state, or local laws relating to employment, including without limitation claims of wrongful discharge, breach of express or implied contract, fraud, misrepresentation, defamation, or liability in tort, and claims of any kind that may be brought in any court or administrative agency including, without limitation, claims under Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. Section 2000, et seq.; the Americans with Disabilities Act, as amended, 42 U.S.C. § 12101 et seq.; the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 701 et seq.; the Civil Rights Act of 1866, and the Civil Rights Act of 1991; 42 U.S.C. Section 1981, et seq.; the Age Discrimination in Employment Act, as amended, 29 U.S.C. Section 621, et seq. (the “***ADEA***”); the

Equal Pay Act, as amended, 29 U.S.C. Section 206(d); regulations of the Office of Federal Contract Compliance, 41 C.F.R. Section 60, et seq.; the Family and Medical Leave Act, as amended, 29 U.S.C. § 2601 et seq.; the Fair Labor Standards Act of 1938, as amended, 29 U.S.C. § 201 et seq.; the Employee Retirement Income Security Act, as amended, 29 U.S.C. § 1001 et seq.; and the California Fair Employment and Housing Act, California Government Code Section 12940, et seq.

Notwithstanding the generality of the foregoing, Executive does not release the following claims:

(i) Claims for unemployment compensation or any state disability insurance benefits pursuant to the terms of applicable state law;

(ii) Claims for workers' compensation insurance benefits under the terms of any worker's compensation insurance policy or fund of the Company;

(iii) Claims pursuant to the terms and conditions of the federal law known as COBRA;

(iv) Claims for indemnity under the bylaws of the Company, as provided for by California law or under any applicable insurance policy or indemnification agreement with respect to Executive's liability as an employee, director or officer of the Company;

(v) Claims based on any right Executive may have to enforce the Company's executory obligations under the Agreement (including, for the avoidance of doubt, Claims to enforce the Company's obligations to pay or provide payments and benefits that are contingent on the effectiveness of this Release); and

(vi) Claims Executive may have to vested or earned compensation and benefits.

(b)EXECUTIVE ACKNOWLEDGES THAT HE OR SHE HAS BEEN ADVISED OF AND IS FAMILIAR WITH THE PROVISIONS OF CALIFORNIA CIVIL CODE SECTION 1542, WHICH PROVIDES AS FOLLOWS:

"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH, IF KNOWN BY HIM OR HER, MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR."

BEING AWARE OF SAID CODE SECTION, EXECUTIVE HEREBY EXPRESSLY WAIVES ANY RIGHTS HE OR SHE MAY HAVE THEREUNDER, AS WELL AS UNDER ANY OTHER STATUTES OR COMMON LAW PRINCIPLES OF SIMILAR EFFECT.

(c) Executive acknowledges that this Release was presented to him or her on the date indicated above and that Executive is entitled to have twenty-one (21) days' time in which to consider it. Executive further acknowledges that the Company has advised him or her that he or she is waiving his or her rights under the ADEA, and that Executive should consult with an attorney of his or her choice before signing this Release, and Executive has had sufficient time to consider the terms of this Release. Executive represents and acknowledges that if Executive executes this Release before twenty-one (21) days have elapsed, Executive does so knowingly, voluntarily, and upon the advice and with the approval of Executive's legal counsel (if any), and that Executive voluntarily waives any remaining consideration period.

(d) Executive understands that after executing this Release, Executive has the right to revoke it within seven (7) days after his or her execution of it. Executive understands that this Release will not become effective and enforceable unless the seven (7) day revocation period passes and Executive does not revoke the Release in writing. Executive understands that this Release may not be revoked after the seven (7) day revocation period has passed. Executive also understands that any revocation of this Release must be made in writing and delivered to the Company at its principal place of business within the seven (7) day period.

(e) Executive understands that this Release shall become effective, irrevocable, and binding upon Executive on the eighth (8th) day after his or her execution of it, so long as Executive has not revoked it within the time period and in the manner specified in clause (d) above. Executive further understands that Executive will not be given any severance benefits under the Agreement unless this Release is effective on or before the date that is sixty (60) days following the date of Executive's Separation from Service (as defined in the Agreement).

(f)Nothing in this Release shall be deemed to restrict Executive's right to communicate directly with, cooperate with, provide information to, or report possible violations of federal law or regulation to, any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 806 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation, including, but not limited to, the U.S. Securities and Exchange Commission, the U.S. Commodity Futures Trading Commission, or the U.S. Department of Justice.

2. No Assignment. Executive represents and warrants to the Company Releasees that there has been no assignment or other transfer of any interest in any Claim that Executive may have against the Company Releasees. Executive agrees to indemnify and hold harmless the Company Releasees from any liability, claims, demands, damages, costs, expenses and attorneys' fees incurred as a result of any such assignment or transfer from Executive.

3. Severability. In the event any provision of this Release is found to be unenforceable by an arbitrator or court of competent jurisdiction, such provision shall be deemed modified to the extent necessary to allow enforceability of the provision as so limited, it being intended that the parties shall receive the benefit contemplated herein to the fullest extent permitted by law. If a deemed modification is not satisfactory in the judgment of such arbitrator or court, the unenforceable provision shall be deemed deleted, and the validity and enforceability of the remaining provisions shall not be affected thereby.

4. Interpretation; Construction. The headings set forth in this Release are for convenience only and shall not be used in interpreting this Agreement. This Release has been drafted by legal counsel representing the Company, but Executive has participated in the negotiation of its terms. Furthermore, Executive acknowledges that Executive has had an opportunity to review and revise the Release and have it reviewed by legal counsel, if desired, and, therefore, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Release. Either party's failure to enforce any provision of this Release shall not in any way be construed as a waiver of any such provision, or prevent that party thereafter from enforcing each and every other provision of this Release.

5. Governing Law and Venue. This Release will be governed by and construed in accordance with the laws of the United States of America and the State of California applicable to contracts made and to be performed wholly within such State, and without regard to the conflicts of laws principles thereof. Any suit brought hereon shall be brought in the state or federal courts sitting in Santa Clara County, California, the Parties hereby waiving any claim or defense that such forum is not convenient or proper.

Each party hereby agrees that any such court shall have in personam jurisdiction over it and consents to service of process in any manner authorized by California law.

6. Entire Agreement. This Release and the Agreement constitute the entire agreement of the Parties in respect of the subject matter contained herein and therein and supersede all prior or simultaneous representations, discussions, negotiations and agreements, whether written or oral. This Release may be amended or modified only with the written consent of Executive and an authorized representative of the Company. No oral waiver, amendment or modification will be effective under any circumstances whatsoever.

7. Counterparts. This Release may be executed in multiple counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument.

(Signature Page Follows)

IN WITNESS WHEREOF, and intending to be legally bound, the Parties have executed the foregoing Release as of the date first written above.

Executive	**Xperi Corporation**
	By:
Print Name:	Print Name:
	Title:

EXHIBIT B

CONFIDENTIALITY AND PROPRIETARY RIGHTS AGREEMENT

[Attached]

EXHIBIT 10.31+

CHANGE IN CONTROL SEVERANCE AGREEMENT

This Change in Control Severance Agreement ("***Agreement***") is made by and between Xperi Corporation, a Delaware corporation (the "***Company***"), and Murali Dharan ("***Executive***"), effective as of October 16, 2017 (such date, the "***Effective Date***"). For purposes of this Agreement (other than Section 1(c) below), the "***Company***" shall mean the Company and its subsidiaries.

The parties agree as follows:

1. Definitions. For purposes of this Agreement, the following terms shall have the following meanings:

(a)"***Board***" shall mean the Board of Directors of the Company.

(b)"***Cause***" shall mean any of the following: (i) Executive's gross negligence or willful misconduct in the performance of his or her duties to the Company and its affiliates; (ii) Executive's willful and habitual neglect of or failure to perform Executive's duties of consulting or employment (which neglect or failure is not caused by Executive's illness or mental or physical disability), which neglect or failure is not cured within thirty (30) days after written notice thereof is received by Executive (it being agreed that a failure of the Company and its affiliates to meet performance objectives shall not, alone, constitute a failure by Executive to perform his duties); (iii) Executive's commission of any material act of fraud, dishonesty or financial or accounting impropriety with respect to the Company and its affiliates which results in a personal benefit to Executive; (iv) Executive's failure to cooperate with the Company and its affiliates in any investigation or formal proceeding initiated by a governmental authority or otherwise approved by the Board or the Audit Committee of the Board (which failure is not caused by Executive's illness or mental or physical disability), which failure is not cured within thirty (30) days after written notice thereof is received by Executive; (v) Executive's conviction of or plea of guilty or *nolo contendere* to felony criminal conduct (other than moving vehicle violations); (vi) Executive's material violation of the Company's Confidentiality and Proprietary Rights Agreement (as defined below) or similar agreement that Executive has entered into with the Company; or (vii) Executive's material breach of any obligation or duty under this Agreement or material violation of any written employment or other Company policies that have previously been furnished to Executive, which breach or violation is not cured within thirty (30) days after written notice thereof is received by Executive, if such breach or violation is capable of being cured.

(c) "***Change in Control***" shall mean and include each of the following:

(i) A transaction or series of transactions (other than an offering of the Company's common stock to the general public through a registration statement filed with the Securities and Exchange Commission) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Securities Exchange Act of 1934, as amended (the "***Exchange Act***")) (other than the Company, any of its subsidiaries, an employee benefit plan maintained by the Company or any of its subsidiaries or a "person" that, prior to such transaction, directly or indirectly controls, is controlled by, or is under common control with, the Company) directly or indirectly acquires beneficial ownership (within the meaning of Rule 13d-3 under the Exchange Act) of securities of the Company possessing more than fifty percent (50%) of the total combined voting power of the Company's securities outstanding immediately after such acquisition; or

(ii) The consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or business combination or (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(A) Which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "***Successor Entity***")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities immediately after the transaction, and

(B) After which no person or group beneficially owns voting securities representing fifty percent (50%) or more of the combined voting power of the Successor Entity; *provided, however,* that no person or group shall be treated for purposes of this Section 1(c)(ii)(B) as beneficially owning fifty percent (50%) or more of combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction.

The Board shall have full and final authority, which shall be exercised in its discretion, to determine conclusively whether a Change in Control of the Company has occurred pursuant to the above definition, and the date of the occurrence of such Change in Control and any incidental matters relating thereto.

Notwithstanding the foregoing, to the extent required by Section 409A of the Code, if a Change in Control would give rise to a payment or benefit event with respect to any payment or benefit hereunder that constitutes "nonqualified deferred compensation," the transaction or event constituting the Change in Control must also constitute a "change in control event" (as defined in Treasury Regulation §1.409A-3(i)(5)) in order to give rise to the payment or benefit, to the extent required by Section 409A of the Code.

(d) "***Code***" means the Internal Revenue Code of 1986, as amended, and the Treasury Regulations and other interpretive guidance thereunder.

(e) "***Good Reason***" shall mean the occurrence of any of the following events or conditions without Executive's written consent:

(i)a material diminution in Executive's authority, duties or responsibilities;

(ii)a material diminution in Executive's base compensation or target annual bonus opportunity, unless such reduction is imposed across-the-board to senior management of the Company (and Executive and the Company agree that without limiting any argument that a lesser diminution is material, any diminution of ten percent (10%) or more measured against Executive's base compensation and target bonus opportunity as in effect on the Effective Date shall be deemed material for purposes of this clause (ii));

(iii) a material change in the geographic location at which Executive must perform his or her duties (and the Company and Executive acknowledge and agree that a change in the geographic location at which Executive must perform his or her duties by more than forty-five (45) miles shall constitute a material change for purposes of this Agreement); or

(iv) any other action or inaction that constitutes a material breach by the Company or any successor or affiliate of its obligations to Executive under this Agreement.

Executive must provide written notice to the Company of the occurrence of any of the foregoing events or conditions without Executive's written consent within ninety (90) days of Executive learning of the occurrence of such event. The Company or any successor or affiliate shall have a period of thirty (30) days to cure such event or condition after receipt of written notice of such event from Executive. Any voluntary Separation from Service for "Good Reason" following such thirty (30) day cure period must occur no later than the date that is six (6) months following the occurrence of one of the foregoing events or conditions without Executive's written consent.

(f) "***Performance Awards***" means any Stock Awards granted to Executive providing for vesting based upon the Executive's or the Company's performance.

(g) "***Permanent Disability***" means Executive's inability to perform the essential functions of his or her position, with or without reasonable accommodation, for a period of at least one hundred twenty (120) consecutive days because of a physical or mental impairment.

(h) "***Separation from Service***" means a "separation from service" within the meaning of Section 409A of the Code.

(i) "***Stock Awards***" means all stock options, restricted stock units and such other equity-based awards granted pursuant to the Company's equity award plans or agreements.

2. Term.

(a) The term of this Agreement (the "***Term***") shall continue until the earlier of (i) the second anniversary of the Effective Date, or (ii) the date on which all payments or benefits required to be made or provided hereunder have been made or provided in their entirety, except to the extent the Term is automatically extended pursuant to Section 2(b).

(b) Notwithstanding the provisions of Section 2(a), the then-effective Term shall automatically be extended in the event that the Term would otherwise expire during the period commencing upon the first public announcement of a definitive agreement that would result in a Change in Control (even though still subject to approval of the Company's stockholders and other conditions and contingencies) and ending on the date that is eighteen (18) months following the occurrence of such Change in Control. Such extension shall be upon the terms and conditions of this Agreement as then in effect, provided that such extension of the Term of this Agreement shall expire upon the first to occur of the first public announcement of the termination of such definitive agreement or the date that is eighteen (18) months following the occurrence of such Change in Control.

(c) Notwithstanding the provisions of Sections 2(a) and (b), the obligation of the Company to make payments or provide benefits pursuant to this Agreement to which Executive has acquired a right in accordance with the applicable provisions of this Agreement prior to the expiration of the Term shall survive the termination of this Agreement until such payments and benefits have been provided in full.

3. Severance.

(a) If Executive has a Separation from Service as a result of Executive's discharge by the Company without Cause or by reason of Executive's resignation for Good Reason, in either case within sixty (60) days prior to a Change in Control or within eighteen (18) months following a Change in Control, Executive shall be entitled to receive, in lieu of any severance benefits to which Executive may otherwise be entitled under any severance plan or program of the Company, the benefits provided below, which, with respect to clause (ii), will be payable in a lump sum on the day that is sixty (60) days following the date of Executive's Separation from Service:

(i)The Company shall pay to Executive his or her fully earned but unpaid base salary, when due, through the date of Executive's Separation from Service at the rate then in effect, reimbursement of business expenses incurred prior to the date of Executive's Separation from Service and properly submitted in accordance with Company policy, plus all other benefits, if any, under any Company group retirement plan, nonqualified deferred compensation plan, equity award plan or agreement (other than any such plan or agreement pertaining to Stock Awards whose treatment is prescribed by Section 3(a)(iv) below), health benefits plan or other Company group benefit plan to which Executive may be entitled pursuant to the terms of such plans or agreements at the time of Executive's Separation from Service (the "***Accrued Obligations***");

(ii) Subject to Section 3(c) and Executive's continued compliance with Section 4, Executive shall be entitled to receive severance pay in an amount equal to one hundred percent (100%) multiplied by the sum of (x) Executive's annual base salary as in effect immediately prior to the date of Executive's Separation from Service, plus (y) Executive's target annual bonus for the calendar year in which Executive's Separation from Service occurs;

(iii) Subject to Section 3(c) and Executive's continued compliance with Section 4, for the period beginning on the date of Executive's Separation from Service and ending on the date which is twelve (12) full months following the date of Executive's Separation from Service (or, if earlier, the date on which the applicable continuation period under the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended ("***COBRA***") expires) (the "***COBRA Coverage Period***"), the Company shall continue to provide Executive and his or her eligible dependents who were covered under the Company's health insurance plans as of the date of Executive's Separation from Service with health (including medical and dental) insurance benefits substantially similar to those provided to Executive and his or her dependents immediately prior to the date of such Separation from Service. If any of the Company's health benefits are self-funded as of the date of Executive's Separation from Service, or if the Company cannot provide the foregoing benefits in a manner that is exempt from or otherwise compliant with applicable law or the provision of such benefits may result in the Company incurring penalties under applicable law (including, without limitation, Section 409A of the Code and Section 2716 of the Public Health Service Act), instead of providing continued health insurance benefits as set forth above, the Company shall instead pay to Executive an amount equal to the monthly premium payment for Executive and his or her eligible dependents who were covered under the Company's health plans as of the date of Executive's Separation from Service (calculated by reference to the premium as of the date of Separation from Service) as currently taxable compensation in substantially equal monthly installments over the COBRA Coverage Period (or the remaining portion thereof);

(iv) Subject to Section 3(c) and Executive's continued compliance with Section 4, the vesting and/or exercisability of each of Executive's outstanding Stock Awards (other than Performance Awards, which will vest as to the "target" number of shares subject to such performance Awards, except to the extent alternative acceleration is specifically provided for pursuant to the grant documents) shall be accelerated in full effective as of the later of (A) the date of Executive's Separation from Service or (B) the date of the Change in Control (provided that payment or settlement of such Stock Awards may be delayed as provided in the grant documents to the extent required by Section 409A of the Code). Nothing in this Section 3(a)(iv) shall be construed to limit any more favorable vesting applicable to Executive's Stock Awards in the Company's equity plan(s) and/or the stock award agreements under which the Stock Awards were granted. The foregoing provisions are hereby deemed to be a part of each Stock Award and to supersede any less favorable provision in any agreement or plan regarding such Stock Award; and

(v) Notwithstanding any other provision of this Agreement to the contrary, any severance benefits payable to Executive under this Agreement shall be reduced by any severance benefits payable by the Company or an affiliate of the Company to such individual under any other policy, plan, program, agreement or arrangement, including, without limitation, any severance agreement between such individual and any entity.

(b) Other Terminations. If Executive's employment is terminated by the Company without Cause or by Executive for Good Reason more than sixty (60) days prior to a Change in Control or more than eighteen (18) months following a Change in Control, or at any time by the Company for Cause, by Executive without Good Reason, or as a result of Executive's death or Permanent Disability, the Company shall not have any other or further obligations to Executive under this Agreement (including any financial obligations) except that Executive shall be entitled to receive the Accrued Obligations. The foregoing shall be in addition to, and not in lieu of, any and all other rights and remedies which may be available to the Company under the circumstances, whether at law or in equity.

(c) Release. As a condition to Executive's receipt of any post-termination benefits pursuant to Section 3(a) above (other than the Accrued Obligations), Executive shall execute and not revoke a general release of all claims in favor of the Company (the "***Release***") in the form substantially similar to that attached hereto as Exhibit A (and any applicable revocation period applicable to such Release shall have expired) within the sixty (60) day period following the date of Executive's Separation from Service.

(d) Exclusive Remedy. Except as otherwise expressly required by law (e.g., COBRA) or as specifically provided herein, all of Executive's rights to salary, severance, benefits, bonuses and other amounts hereunder (if any) accruing after the termination of Executive's employment shall cease upon such termination. In the event of a termination of Executive's employment with the Company, and except in the event of violation of applicable law by the Company relating to Executive's employment or the termination thereof, Executive's sole remedy shall be to receive the payments and benefits described in this Section 3 plus, subject to Section 3(a)(v) above, any payments due to Executive under the Severance Agreement (defined below).

(e) No Mitigation. Executive shall not be required to mitigate the amount of any payment provided for in this Section 3 by seeking other employment or otherwise, nor shall the amount of any payment or benefit provided for in this Section 3 be reduced by any compensation earned by Executive as the result of employment by another employer or self-employment or by retirement benefits; *provided*, *however*, that loans, advances or other amounts owed by Executive to the Company may be offset by the Company and its affiliates against amounts payable to Executive under this Section 3.

(f)Return of the Company's Property. If Executive's employment is terminated for any reason, the Company shall have the right, at its option, to require Executive to vacate his or her offices prior to or on the effective date of termination and to cease all activities on the Company's behalf. Upon the termination of his or her employment in any manner, as a condition to Executive's receipt of any post-termination benefits described in this Agreement, Executive shall immediately surrender to the Company all lists, books and records of, or in connection with, the Company's business, and all other property belonging to the Company and its affiliates, it being distinctly understood that all such lists, books and records, and other documents, are the property of the Company and its affiliates. Executive shall deliver to the Company a signed statement certifying compliance with this Section 3(f) prior to the receipt of any post-termination benefits described in this Agreement.

(g)Best Pay Provision.

(i) If any payment or benefit Executive would receive under this Agreement, when combined with any other payment or benefit Executive receives pursuant to the termination of Executive's employment with the Company and its affiliates ("***Payment***"), would (A) constitute a "parachute payment" within the meaning of Section 280G of the Code, and (B) but for this sentence, be subject to the excise tax imposed by Section 4999 of the Code (the "***Excise Tax***"), then such Payment shall be either (1) the full amount of such Payment or (2) such lesser amount (with cash payments being reduced before stock option compensation) as would result in no portion of the Payment being subject to the Excise Tax, whichever of the foregoing amounts, taking into account the applicable federal, state and local employment taxes, income taxes, and the Excise Tax, results in Executive's receipt, on an after-tax basis, of the greater amount of the Payment notwithstanding that all or some portion of the Payment may be subject to the Excise Tax.

(ii) All determinations required to be made under this Section 3(g), including whether and to what extent the Payments shall be reduced and the assumptions to be utilized in arriving at such determination, shall be made by the nationally recognized certified public accounting firm used by the Company immediately prior to the effective date of the Change in Control or, if such firm declines to serve, such other nationally recognized certified public accounting firm as may be designated by the Company (the "***Accounting Firm***"). The Accounting Firm shall provide detailed supporting calculations both to Executive and the Company at such time as is requested by the Company. All fees and expenses of the Accounting Firm shall be borne solely by the Company. Any determination by the Accounting Firm shall be binding upon Executive and the Company. For purposes of making the calculations required by this Section 3(g), the Accounting Firm may make reasonable assumptions and approximations concerning applicable taxes and may rely on reasonable, good-faith interpretations concerning the application of Sections 280G and 4999 of the Code.

4. Confidentiality and Proprietary Rights. Executive and the Company have executed the Company's Confidentiality and Proprietary Rights Agreement, a copy of which is attached to this Agreement as Exhibit B and incorporated herein by reference (the "***Confidentiality and Proprietary Rights Agreement***"). The Company shall be entitled to cease all severance payments and benefits to Executive in the event of his or his material breach of this Section 4. Nothing in this Agreement or in the Confidentiality and Proprietary Rights Agreement shall be deemed to restrict Executive's right to communicate directly with, cooperate with, provide information to, or report possible violations of federal law or regulation to, any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 806 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation, including, but not limited to, the U.S. Securities and Exchange Commission, the U.S. Commodity Futures Trading Commission, or the U.S. Department of Justice.

5. Agreement to Arbitrate. Any dispute, claim or controversy based on, arising out of or relating to Executive's employment or this Agreement shall be settled by final and binding arbitration in San Jose, California, before a single neutral arbitrator in accordance with the Employment Arbitration Rules and Procedures (the "***Rules***") of Judicial Arbitration and Mediation Services ("***JAMS***"), and judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction. The Rules may be found online at www.jamsadr.com. Arbitration may be compelled pursuant to the California Arbitration Act (Code of Civil Procedure §§ 1280 et seq.). If the parties are unable to agree upon an arbitrator, one shall be appointed by JAMS in accordance with its Rules. Each party shall pay the fees of its own attorneys, the expenses of its witnesses and all other expenses connected with presenting its case; *provided*, *however*, Executive and the Company agree that, to the extent permitted by law, the arbitrator may, in his or her discretion, award reasonable attorneys' fees to the prevailing party; *provided*, *further*, that the prevailing party shall be reimbursed for such fees, costs and expenses within forty-five (45) days following any such award, but in no event later than the last day of the Executive's taxable year following the taxable year in which the fees, costs and expenses were incurred; *provided*, *further*, that the parties' obligations pursuant to this sentence shall terminate on the tenth (10th) anniversary of the date of Executive's termination of employment; *provided*, *however*, that Executive shall retain the right to file administrative charges with or seek relief through any government agency of competent jurisdiction, and to participate in any government investigation, including but not limited to (a) claims for workers' compensation, state disability insurance or unemployment insurance; (b) claims for unpaid wages or waiting time penalties brought before the California Division of Labor Standards Enforcement; *provided*, *however*, that any appeal from an award or from denial of an award of wages and/or waiting time penalties shall be arbitrated pursuant to the terms of

this Agreement; and (c) claims for administrative relief from the United States Equal Employment Opportunity Commission and/or the California Department of Fair Employment and Housing (or any similar agency in any applicable jurisdiction other than California); *provided*, *further*, that Executive shall not be entitled to obtain any monetary relief through such agencies other than workers' compensation benefits or unemployment insurance benefits. Other costs of the arbitration, including the cost of any record or transcripts of the arbitration, JAMS' administrative fees, the fee of the arbitrator, and all other fees and costs, shall be borne by the Company. This Section 5 is intended to be the exclusive method for resolving any and all claims by the parties against each other for payment of damages under this Agreement or relating to Executive's employment; *provided*, *however*, that neither this Agreement nor the submission to arbitration shall limit the parties' right to seek provisional relief, including without limitation injunctive relief, in any court of competent jurisdiction pursuant to California Code of Civil Procedure § 1281.8 or any similar statute of an applicable jurisdiction. Seeking any such relief shall not be deemed to be a waiver of such party's right to compel arbitration. Both Executive and the Company expressly waive their right to a jury trial.

6. <u>At-Will Employment Relationship</u>. Executive's employment with the Company is at-will and not for any specified period and may be terminated at any time, with or without Cause or advance notice, by either Executive or the Company. Any change to the at-will employment relationship must be by specific, written agreement signed by Executive and an authorized representative of the Company. Nothing in this Agreement is intended to or should be construed to contradict, modify or alter this at-will relationship.

7. <u>General Provisions</u>.

7.1 <u>Successors and Assigns</u>. The rights of the Company under this Agreement may, without the consent of Executive, be assigned by the Company, in its sole and unfettered discretion, to 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. The Company will require any successor (whether direct or indirect, by purchase, merger or otherwise) to all or substantially all of the business or assets of the Company expressly to assume and to agree to perform this Agreement in the same manner and to the same extent that the Company would be required to perform it if no such succession had taken place; *provided*, *however*, that no such assumption shall relieve the Company of its obligations hereunder; *provided*, *further*, that the failure of any such successor to so assume this Agreement shall constitute a material breach of this Agreement. As used in this Agreement, the "***Company***" shall mean the Company as hereinbefore defined and any successor to its business and/or assets as aforesaid which assumes and agrees to perform this Agreement by operation of law or otherwise. Executive shall not be entitled to assign any of Executive's rights or obligations under this Agreement. This Agreement shall inure to the benefit of and be enforceable by Executive's personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

7.2 <u>Severability</u>. In the event any provision of this Agreement is found to be unenforceable by an arbitrator or court of competent jurisdiction, such provision shall be deemed modified to the extent necessary to allow enforceability of the provision as so limited, it being intended that the parties shall receive the benefit contemplated herein to the fullest extent permitted by law. If a deemed modification is not satisfactory in the judgment of such arbitrator or court, the unenforceable provision shall be deemed deleted, and the validity and enforceability of the remaining provisions shall not be affected thereby.

7.3 <u>Interpretation; Construction</u>. The headings set forth in this Agreement are for convenience only and shall not be used in interpreting this Agreement. This Agreement has been drafted by legal counsel representing the Company, but Executive has participated in the negotiation of its terms. Furthermore, Executive acknowledges that Executive has had an opportunity to review and revise the Agreement and have it reviewed by legal counsel, if desired, and, therefore, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement. Either party's failure to enforce any provision of this Agreement shall not in any way be construed as a waiver of any such provision, or prevent that party thereafter from enforcing each and every other provision of this Agreement.

7.4 Governing Law and Venue. This Agreement will be governed by and construed in accordance with the laws of the United States and the State of California applicable to contracts made and to be performed wholly within such State, and without regard to the conflicts of laws principles thereof. Any suit brought hereon shall be brought in the state or federal courts sitting in Santa Clara County, California, the Parties hereby waiving any claim or defense that such forum is not convenient or proper. Each party hereby agrees that any such court shall have in personam jurisdiction over it and consents to service of process in any manner authorized by California law.

7.5 Notices. Any notice required or permitted by this Agreement shall be in writing and shall be delivered as follows with notice deemed given as indicated: (a) by personal delivery when delivered personally; (b) by overnight courier upon written verification of receipt; (c) by telecopy or facsimile transmission upon acknowledgment of receipt of electronic transmission; or (d) by certified or registered mail, return receipt requested, upon verification of receipt. Notice shall be sent to Executive at the address set forth below and to the Company at its principal place of business, or such other address as either party may specify in writing.

7.6 Survival. Sections 1 ("Definitions"), 3 ("Severance"), 4 ("Confidentiality and Proprietary Rights"), 5 ("Agreement to Arbitrate") and 7 ("General Provisions") of this Agreement shall survive termination of Executive's employment by the Company.

7.7 Entire Agreement. This Agreement and the Confidentiality and Proprietary Rights Agreement incorporated herein by reference together constitute the entire agreement between the parties in respect of the subject matter contained herein and therein and supersede all prior or simultaneous representations, discussions, negotiations, and agreements, whether written or oral, including, without limitation, the Existing Agreement. This Agreement may be amended or modified only with the written consent of Executive and an authorized representative of the Company. No oral waiver, amendment or modification will be effective under any circumstances whatsoever. Notwithstanding the foregoing or anything herein to the contrary, although severance provided under the Executive's Severance Agreement made by and between the Company and the Executive effective as of December 1, 2016 (the "***Severance Agreement***") may offset severance provided hereunder (as specified in Section 3(a)(v)), the Severance Agreement is outside the scope of the foregoing integration provision and shall continue in full force and effect.

7.8 Code Section 409A.

(a) To the extent applicable, this Agreement shall be interpreted in accordance with Code Section 409A and Department of Treasury regulations and other interpretive guidance issued thereunder. Each series of installment payments made under this Agreement is hereby designated as a series of "separate payments" within the meaning of Section 409A of the Code.

(b)If the Executive is a "specified employee" (as defined in Section 409A of the Code), as determined by the Company in accordance with Section 409A of the Code, on the date of the Executive's Separation from Service, to the extent that the payments or benefits under this Agreement are subject to Section 409A of the Code and the delayed payment or distribution of all or any portion of such amounts to which Executive is entitled under this Agreement is required in order to avoid a prohibited distribution under Section 409A(a)(2)(B)(i) of the Code, then such portion deferred pursuant to this Section 7.8(b) shall be paid or distributed to Executive in a lump sum on the earlier of (i) the date that is six (6)-months following Executive's Separation from Service, (ii) the date of Executive's death or (iii) the earliest date as is permitted under Section 409A of the Code. Any remaining payments due under the Agreement shall be paid as otherwise provided herein.

(c) Notwithstanding anything to the contrary in this Agreement, in-kind benefits and reimbursements provided under this Agreement during any tax year of Executive shall not affect in-kind benefits or reimbursements to be provided in any other tax year of Executive and are not subject to liquidation or exchange for another benefit. Notwithstanding anything to the contrary in this Agreement, reimbursement requests must be timely submitted by Executive and, if timely submitted, reimbursement payments shall be made to Executive as soon as administratively practicable following such submission, but in no event later than the last day of Executive's taxable year following the taxable year in which the expense was incurred. In no event shall Executive be entitled to any reimbursement payments after the last day of Executive's taxable year following the taxable year in which the expense was incurred. This section shall only apply to in-kind benefits and reimbursements that would result in taxable compensation income to Executive.

7.9 Consultation with Legal and Financial Advisors. By executing this Agreement, Executive acknowledges that this Agreement confers significant legal rights, and may also involve the waiver of rights under other agreements; that the Company has encouraged Executive to consult with Executive's personal legal and financial advisors; and that Executive has had adequate time to consult with Executive's advisors before executing this Agreement.

7.10 Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

(Signature Page Follows)

THE PARTIES TO THIS AGREEMENT HAVE READ THE FOREGOING AGREEMENT AND FULLY UNDERSTAND EACH AND EVERY PROVISION CONTAINED HEREIN. WHEREFORE, THE PARTIES HAVE EXECUTED THIS AGREEMENT ON THE DATES SHOWN BELOW.

XPERI CORPORATION

Dated: By:

Name: Kris Graves
Title: Chief Human Resources Officer

EXECUTIVE

Dated:
Print Name:

Address:

EXHIBIT A

GENERAL RELEASE OF CLAIMS

[The language in this Release may change based on legal developments and evolving best practices; provided, however, that no new post-termination covenants shall be imposed on Executive; this form is provided as an example of what will be included in the final Release document.]

This General Release of Claims ("***Release***") is entered into as of this _____ day of ________, ____, between ___________ ("***Executive***"), and Xperi Corporation, a Delaware corporation (the "***Company***") (collectively referred to herein as the "***Parties***").

WHEREAS, Executive and the Company are parties to that certain Change in Control Severance Agreement dated as of _______, ____ (the "***Agreement***");

WHEREAS, the Parties agree that Executive is entitled to certain severance benefits under the Agreement, subject to Executive's execution of this Release; and

WHEREAS, the Company and Executive now wish to fully and finally to resolve all matters between them.

NOW, THEREFORE, in consideration of, and subject to, the severance benefits payable to Executive pursuant to the Agreement, the adequacy of which is hereby acknowledged by Executive, and which Executive acknowledges that he or she would not otherwise be entitled to receive, Executive and the Company hereby agree as follows:

1. General Release of Claims by Executive.

(a)Executive, on behalf of himself or herself and his or her executors, heirs, administrators, representatives and assigns, hereby agrees to release and forever discharge the Company and all predecessors, successors and their respective parent corporations, affiliates, related, and/or subsidiary entities, and all of their past and present investors, directors, shareholders, officers, general or limited partners, employees, attorneys, agents and representatives, and the employee benefit plans in which Executive is or has been a participant by virtue of his or her employment with or service to the Company (collectively, the "***Company Releasees***"), from any and all claims, debts, demands, accounts, judgments, rights, causes of action, equitable relief, damages, costs, charges, complaints, obligations, promises, agreements, controversies, suits, expenses, compensation, responsibility and liability of every kind and character whatsoever (including attorneys' fees and costs), whether in law or equity, known or unknown, asserted or unasserted, suspected or unsuspected (collectively, "***Claims***"), which Executive has or may have had against such entities based on any events or circumstances arising or occurring on or prior to the date hereof or on or prior to the date hereof, arising directly or indirectly out of, relating to, or in any other way involving in any manner whatsoever Executive's employment by or service to the Company or the termination thereof, including any and all claims arising under federal, state, or local laws relating to employment, including without limitation claims of wrongful discharge, breach of express or implied contract, fraud, misrepresentation, defamation, or liability in tort, and claims of any kind that may be brought in any court or administrative agency including, without limitation, claims under Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. Section 2000, et seq.; the Americans with Disabilities Act, as amended, 42 U.S.C. § 12101 et seq.; the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 701 et seq.; the Civil Rights Act of 1866, and the Civil Rights Act of 1991; 42 U.S.C. Section 1981, et seq.; the Age Discrimination in Employment Act, as amended, 29 U.S.C. Section 621, et seq. (the "***ADEA***"); the

Equal Pay Act, as amended, 29 U.S.C. Section 206(d); regulations of the Office of Federal Contract Compliance, 41 C.F.R. Section 60, et seq.; the Family and Medical Leave Act, as amended, 29 U.S.C. § 2601 et seq.; the Fair Labor Standards Act of 1938, as amended, 29 U.S.C. § 201 et seq.; the Employee Retirement Income Security Act, as amended, 29 U.S.C. § 1001 et seq.; and the California Fair Employment and Housing Act, California Government Code Section 12940, et seq.

Notwithstanding the generality of the foregoing, Executive does not release the following claims:

(i) Claims for unemployment compensation or any state disability insurance benefits pursuant to the terms of applicable state law;

(ii) Claims for workers' compensation insurance benefits under the terms of any worker's compensation insurance policy or fund of the Company;

(iii) Claims pursuant to the terms and conditions of the federal law known as COBRA;

(iv) Claims for indemnity under the bylaws of the Company, as provided for by California law or under any applicable insurance policy or indemnification agreement with respect to Executive's liability as an employee, director or officer of the Company;

(v) Claims based on any right Executive may have to enforce the Company's executory obligations under the Agreement (including, for the avoidance of doubt, Claims to enforce the Company's obligations to pay or provide payments and benefits that are contingent on the effectiveness of this Release); and

(vi) Claims Executive may have to vested or earned compensation and benefits.

(b)EXECUTIVE ACKNOWLEDGES THAT HE OR SHE HAS BEEN ADVISED OF AND IS FAMILIAR WITH THE PROVISIONS OF CALIFORNIA CIVIL CODE SECTION 1542, WHICH PROVIDES AS FOLLOWS:

"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH, IF KNOWN BY HIM OR HER, MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR."

BEING AWARE OF SAID CODE SECTION, EXECUTIVE HEREBY EXPRESSLY WAIVES ANY RIGHTS HE OR SHE MAY HAVE THEREUNDER, AS WELL AS UNDER ANY OTHER STATUTES OR COMMON LAW PRINCIPLES OF SIMILAR EFFECT.

(c) Executive acknowledges that this Release was presented to him or her on the date indicated above and that Executive is entitled to have twenty-one (21) days' time in which to consider it. Executive further acknowledges that the Company has advised him or her that he or she is waiving his or her rights under the ADEA, and that Executive should consult with an attorney of his or her choice before signing this Release, and Executive has had sufficient time to consider the terms of this Release. Executive represents and acknowledges that if Executive executes this Release before twenty-one (21) days have elapsed, Executive does so knowingly, voluntarily, and upon the advice and with the approval of Executive's legal counsel (if any), and that Executive voluntarily waives any remaining consideration period.

(d) Executive understands that after executing this Release, Executive has the right to revoke it within seven (7) days after his or her execution of it. Executive understands that this Release will not become effective and enforceable unless the seven (7) day revocation period passes and Executive does not revoke the Release in writing. Executive understands that this Release may not be revoked after the seven (7) day revocation period has passed. Executive also understands that any revocation of this Release must be made in writing and delivered to the Company at its principal place of business within the seven (7) day period.

(e) Executive understands that this Release shall become effective, irrevocable, and binding upon Executive on the eighth (8th) day after his or her execution of it, so long as Executive has not revoked it within the time period and in the manner specified in clause (d) above. Executive further understands that Executive will not be given any severance benefits under the Agreement unless this Release is effective on or before the date that is sixty (60) days following the date of Executive's Separation from Service (as defined in the Agreement).

(f)Nothing in this Release shall be deemed to restrict Executive's right to communicate directly with, cooperate with, provide information to, or report possible violations of federal law or regulation to, any governmental agency or entity in accordance with the provisions of and rules promulgated under Section 21F of the Securities Exchange Act of 1934 or Section 806 of the Sarbanes-Oxley Act of 2002, or any other whistleblower protection provisions of state or federal law or regulation, including, but not limited to, the U.S. Securities and Exchange Commission, the U.S. Commodity Futures Trading Commission, or the U.S. Department of Justice.

2. No Assignment. Executive represents and warrants to the Company Releasees that there has been no assignment or other transfer of any interest in any Claim that Executive may have against the Company Releasees. Executive agrees to indemnify and hold harmless the Company Releasees from any liability, claims, demands, damages, costs, expenses and attorneys' fees incurred as a result of any such assignment or transfer from Executive.

3. Severability. In the event any provision of this Release is found to be unenforceable by an arbitrator or court of competent jurisdiction, such provision shall be deemed modified to the extent necessary to allow enforceability of the provision as so limited, it being intended that the parties shall receive the benefit contemplated herein to the fullest extent permitted by law. If a deemed modification is not satisfactory in the judgment of such arbitrator or court, the unenforceable provision shall be deemed deleted, and the validity and enforceability of the remaining provisions shall not be affected thereby.

4. Interpretation; Construction. The headings set forth in this Release are for convenience only and shall not be used in interpreting this Agreement. This Release has been drafted by legal counsel representing the Company, but Executive has participated in the negotiation of its terms. Furthermore, Executive acknowledges that Executive has had an opportunity to review and revise the Release and have it reviewed by legal counsel, if desired, and, therefore, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Release. Either party's failure to enforce any provision of this Release shall not in any way be construed as a waiver of any such provision, or prevent that party thereafter from enforcing each and every other provision of this Release.

5. Governing Law and Venue. This Release will be governed by and construed in accordance with the laws of the United States of America and the State of California applicable to contracts made and to be performed wholly within such State, and without regard to the conflicts of laws principles thereof. Any suit brought hereon shall be brought in the state or federal courts sitting in Santa Clara County, California, the Parties hereby waiving any claim or defense that such forum is not convenient or proper.

Each party hereby agrees that any such court shall have in personam jurisdiction over it and consents to service of process in any manner authorized by California law.

6. Entire Agreement. This Release and the Agreement constitute the entire agreement of the Parties in respect of the subject matter contained herein and therein and supersede all prior or simultaneous representations, discussions, negotiations and agreements, whether written or oral. This Release may be amended or modified only with the written consent of Executive and an authorized representative of the Company. No oral waiver, amendment or modification will be effective under any circumstances whatsoever.

7. Counterparts. This Release may be executed in multiple counterparts, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument.

(Signature Page Follows)

IN WITNESS WHEREOF, and intending to be legally bound, the Parties have executed the foregoing Release as of the date first written above.

EXECUTIVE	**XPERI CORPORATION**
	By:
Print Name:	Print Name:
	Title:

EXHIBIT B

CONFIDENTIALITY AND PROPRIETARY RIGHTS AGREEMENT

[Attached]

SUBSIDIARIES OF THE REGISTRANT

DigitalOptics Corporation MEMS, a Delaware corporation
DigitalOptics Corporation, a Delaware corporation
DLLNI LIMITED, a company organized under the laws of England and Wales
DTS (Asia) Limited, a company organized under the laws of Hong Kong
DTS (Asia) Limited, Korea Branch (S. Korea)
DTS (BVI) AZ Research Limited, a company organized under the laws of the British Virgin Islands
DTS (BVI) Limited, a company organized under the laws of British Virgin Islands
DTS Asia Limited Taiwan Branch (Taiwan)
DTS China Holding Limited, a company organized under the laws of British Virgin Islands
DTS China Licensing (Hong Kong) Ltd., a company organized under the laws of Hong Kong
DTS International Services GmbH (Germany)
dts Japan KK, a company organized under the laws of Japan
DTS Licensing Limited, an Irish limited corporation
DTS, Inc., a Delaware corporation
FotoNation Corporation, a Delaware corporation
FotoNation Limited, an Irish limited corporation
FotoNation SRL, a Romanian limited liability corporation
Guangzhou DTS Digital Theater Systems, Co. Ltd., a company organized under the People's Republic of China
iBiquity Digital Corporation, a Delaware corporation
iBiquity Digital, S. de R.L. de C.V., a company organized under the laws of Mexico
Invensas Bonding Technologies Inc. [f/k/a Ziptronix, Inc.] a Delaware corporation
Invensas Corporation, a Delaware corporation
Manzanita Systems, LLC, a California limited liability company
Phorus, Inc., a Delaware corporation
Tessera Advanced Technologies, Inc., a Delaware corporation
Tessera Intellectual Property Corp., a Delaware corporation
Tessera Technologies, Inc., a Delaware corporation
Tessera, Inc., a Delaware corporation
Xperi Canada Corporation, incorporated under the laws of Canada
Perceive Canada Corporation, incorporated under the laws of Canada
Perceive Corporation, a Delaware Corporation
Xcelsis Corporation, a Delaware Corporation

The names of other subsidiaries are omitted. Such subsidiaries would not, if considered in the aggregate as a single subsidiary, constitute a significant subsidiary within the meaning of Item 601(b)(21)(ii) of Regulation S-K.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (No. 333-224652, 333-219565 and 333-214862) and Post-Effective Amendments No.1 on Form S-8 (333-195948, 333-190138, 333-168597, 333-151659, 333-137933, 333-131457, 333-116369, 333-115311 and 333-112238) of Xperi Corporation of our report dated February 20, 2019 relating to the financial statements, financial statement schedule, and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

San Jose, CA
February 20, 2019

Exhibit 31.1

Certification of the Chief Executive Officer
Pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934

I, Jon Kirchner, certify that:

1. I have reviewed this annual report on Form 10-K of Xperi Corporation;

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 registrant 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.

February 20, 2019	/s/ Jon Kirchner
	Jon Kirchner
	Chief Executive Officer

Exhibit 31.2

Certification of the Chief Financial Officer
Pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934

I, Robert Andersen, certify that:

1. I have reviewed this annual report on Form 10-K of Xperi Corporation;

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 registrant 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 20, 2019

/s/ Robert Andersen

Robert Andersen
Executive Vice President and Chief Financial Officer

Exhibit 32.1

**CERTIFICATION PURSUANT TO
RULE 13a-14(b) OF THE SECURITIES EXCHANGE ACT OF 1934
AND 18 U.S.C. SECTION 1350**

In connection with the Annual Report of Xperi Corporation, a Delaware corporation (the “Company”), on Form 10-K for the year ended December 31, 2018 as filed with the Securities and Exchange Commission (the “Report”), I, Jon Kirchner, Chief Executive Officer, certify, pursuant to Rule 13a-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. § 1350, as adopted pursuant to § 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, as amended; 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/ Jon Kirchner

Jon Kirchner
Chief Executive Officer
February 20, 2019

**CERTIFICATION PURSUANT TO
RULE 13a-14(b) OF THE SECURITIES EXCHANGE ACT OF 1934
AND 18 U.S.C. SECTION 1350**

In connection with the Annual Report of Xperi Corporation, a Delaware corporation (the “Company”), on Form 10-K for the year ended December 31, 2018 as filed with the Securities and Exchange Commission (the “Report”), I, Robert Andersen, Chief Financial Officer of the Company, certify, pursuant to Rule 13a-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. § 1350, as adopted pursuant to § 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, as amended; 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/ Robert Andersen

Robert Andersen
Executive Vice President and Chief Financial Officer
February 20, 2019

A signed original of this written statement required by Rule 13a-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350 has been provided to the Registrant and will be retained by the Registrant and furnished to the Securities and Exchange Commission or its staff upon request.