HARMONIC INC
Form 10-K
March 01, 2019
Table of Content

2018 Annual Report

Table of Content

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-K

(Mark One)
ý ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the Fiscal Year Ended December 31, 2018
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
Commission File No. 000-25826

HARMONIC INC.
(Exact name of Registrant as specified in its charter)

Delaware	77-0201147
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

4300 North First Street
San Jose, CA 95134
(408) 542-2500
(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)
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 $.001 per share	The NASDAQ Stock Market LLC

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 ý
Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes ¨ No ý
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 ý 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 during the preceding 12 months (or for such shorter period that the Registrant was required to submit and post such files). Yes ý 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 the 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. ý
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	¨	Accelerated filer	ý
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 Exchange Act).   Yes ¨   No ý

Based on the reported closing sale price of the Common Stock on The NASDAQ Global Select Market on June 29, 2018, the aggregate market value of the voting Common Stock held by non-affiliates of the Registrant was approximately $106,193,000. Shares of Common Stock held by each executive officer and director and by each person who owns 5% or more of the outstanding Common Stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of shares outstanding of the Registrant's Common Stock, $.001 par value, was 88,678,700 on February 22, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the Registrant's 2018 Annual Meeting of Stockholders (which will be filed with the Securities and Exchange Commission within 120 days of the end of the fiscal year ended December 31, 2018) are incorporated by reference in Part III of this Annual Report on Form 10-K.

Table of Content

HARMONIC INC.
FORM 10-K
TABLE OF CONTENTS

Table of Content

Forward Looking Statements

Some of the statements contained in this Annual Report on Form 10-K are forward-looking statements that involve risk and uncertainties. The statements contained in this Annual Report on Form 10-K that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), including, without limitation, statements regarding our expectations, beliefs, intentions or strategies regarding the future. In some cases, you can identify forward-looking statements by terminology such as, "may," "will," "should," "expects," "plans," "anticipates," "believes," "intends," "estimates," "predicts," "potential," or "continue" or the negative of these terms or other comparable terminology. These forward-looking statements include, but are not limited to, statements regarding:

- developing trends and demands in the markets we address, particularly emerging markets;
- economic conditions, particularly in certain geographies, and in financial markets;
- new and future products and services;
- spending of our customers;
- our strategic direction, future business plans and growth strategy;
- industry and customer consolidation;
- expected demand for and benefits of our products and services;
- concentration of revenue sources;
- expectations regarding our CableOS solutions;
- expectations regarding the impact of warrants issued to Comcast on our business;
- potential future acquisitions and dispositions;
- anticipated results of potential or actual litigation;
- our competitive environment;
- the impact of our restructuring plans;
- the impact of governmental regulations, including with respect to tariffs and economic sanctions;
- anticipated revenue and expenses, including the sources of such revenue and expenses;
- expected impacts of changes in accounting rules;
- expectations regarding the usability of our inventory and the risk that inventory will exceed forecasted demand;
- expectations and estimates related to goodwill and intangible assets and their associated carrying value;
- expectations regarding the applicability of tax provisions, including with respect to credits related to our acquisition of Thomson Video Networks ("TVN"); and
- use of cash, cash needs and ability to raise capital, including repaying or refinancing our convertible notes.

These statements are subject to known and unknown risks, uncertainties and other factors, which may cause our actual results to differ materially from those implied by the forward-looking statements. Important factors that may cause actual results to differ from expectations include those discussed in "Risk Factors" beginning on page 14 in this Annual Report on Form 10-K. All forward-looking statements included in this Annual Report on Form 10-K are based on information available to us on the date thereof, and we assume no obligation to update any such forward-looking statements. The terms "Harmonic," "Company," "we," "us," "its," and "our", as used in this Annual Report on Form 10-K, refe Harmonic Inc. and its subsidiaries and its predecessors as a combined entity, except where the context requires otherwise.

Table of Content

PART I

Item 1. BUSINESS

We are a leading global provider of (i) versatile and high performance video delivery software, products, system solutions and services that enable our customers to efficiently create, prepare, store, playout and deliver a full range of high-quality broadcast and "over-the-top" (OTT) video services to consumer devices, including televisions, personal computers, laptops, tablets and smart phones and (ii) cable access solutions that enable cable operators to more efficiently and effectively deploy high-speed internet, for data, voice and video services to consumers.

We operate in two segments, Video and Cable Access. Our Video business provides video processing and production and playout solutions and services worldwide to cable operators and satellite and telecommunications (telco) pay-TV service providers, which we refer to collectively as "service providers," and to broadcast and media companies, including streaming media companies. Our Video business infrastructure solutions are delivered either through shipment of our products, software licenses or as software-as-a-service ("SaaS") subscriptions. Our Cable Access business provides cable access solutions and related services, including our CableOS software-based cable access solution, primarily to cable operators globally.

Across our two business segments, we derived approximately 54% of our revenue from the Americas in 2018. The Europe, Middle East and Africa (EMEA) and Asia Pacific (APAC) regions accounted for 27% and 19% of our 2018 revenue, respectively.

Harmonic was initially incorporated in California in June 1988, and was reincorporated in Delaware in May 1995. Our principal executive offices are located at 4300 North First Street, San Jose, California 95134. Our telephone number is (408) 542-2500. Our Internet website is http://www.harmonicinc.com. Other than the information expressly set forth in this Annual Report on Form 10-K, the information contained or referred to on our website is not part of this report.

Industry Overview and Market Trends

Video Business

We believe our customers must continue to employ innovative technologies and services to address key trends in the dynamic video industry.

Demand for Video Services Anytime, Anywhere, on any Device. In our ubiquitous multiscreen video environment, video programming and content needs to be transformed into multiple formats, bit rates and resolutions for display on a broad range of devices.

Demand for High Quality Video. Consumer demand for high quality video anytime, anywhere and on any device requires ever-increasing bandwidth capacity in service providers' networks, as well as technology that maximizes network bandwidth efficiency. With the advent of Ultra High Definition (Ultra HD) televisions and OTT services increasingly being rendered in "4K" high resolution and consuming approximately four times the bandwidth of traditional HD channels, we believe next generation compression technologies, such as High Efficiency Video Compression (HEVC) or advances in H.264/AVC codecs, as well as increasing requirements for HDR encoding, will continue to remain a high priority for distributors of video.

Streaming Video Service. Consumer demand for video download and streaming services from streaming media companies such as Netflix, Hulu, Google (YouTube), Amazon (Prime Video) and Apple (iTunes) continue to experience significant global growth. These and other similar services aggregate third-party and original content and stream video "over-the-top" (OTT) to any Internet-connected device utilizing Internet service providers' networks at no incremental infrastructure cost to the consumer.

Time-Shifted Viewing. "Time-shifting" technologies include digital video recorders (DVRs), cloud and network DVRs (cDVR and nDVR) that allow a subscriber to store programming on the service provider's servers or in the cloud, and video-on-demand (VOD) services.

In response to these trends and the success of OTT streaming media companies, as well as the growing trend of "cord-cutters" (i.e., consumers who cancel traditional pay-TV subscriptions in favor of streaming services), "cord-shavers" (i.e., consumers who switch to smaller bundles of pay-TV subscriptions) and "cord-nevers" (i.e., consumers who have never had a pay-TV subscription):

4

Table of Content

- service providers and broadcast and media companies continue to provide more of their own OTT streaming video services, including OTT streaming of live (or "linear") television programming;
- we believe providers of these OTT services will continue to expand monetization opportunities with personalized and dynamic ad insertion, thereby expanding technological and infrastructure requirements;
- service providers are competing to offer higher quality video signals in HD, including evolving initiatives to deliver video in 4K Ultra HD resolution;
- service providers are developing and expanding their content delivery and Internet Protocol (IP) networks, and increasing the capacity and efficiency of their networks with investments in various delivery infrastructure technologies to, among other things, maximize video quality and minimize bandwidth utilization;
- service providers continue to consolidate to achieve greater economies of scale and subscriber concentration, and acquire media companies to expand their content libraries and capabilities to develop original content;
- service providers continue to enhance and differentiate their content offerings, either through in-house development of new content or through acquisitions of existing content brands; and
- service providers have an ongoing need, despite the migration of traffic to OTT, to provide services over their existing broadcast distribution infrastructures.

We believe that the delivery of video over IP will continue to change traditional video viewing habits and distribution methods and alter the traditional advertising and subscription business models of major service providers.

Our Video Markets

Service Providers

- Cable Operators. Cable operators continue to focus on various initiatives to improve and differentiate their service offerings from competing service providers, including: bundled digital video, voice and high speed data services; expansion of VOD libraries and on-demand and streaming service offerings; upgraded consumer-facing applications; video delivery over IP to broadband enabled consumer devices; and capacity enhancement of high-speed data services.
- Satellite Operators. Satellite operators around the world have established digital television services that serve tens of millions of subscribers, with the ability to provide tens of thousands of linear channels. We believe these linear services will continue to grow, particularly in emerging markets, while, in parallel, satellite operators launch new streaming services, such as Sling TV and DirecTV Now, to address younger generation viewers and new consumption habits.
- Telcos. Telcos have established video offerings to successfully compete in the video marketplace, including high-quality HD content, larger VOD libraries, time-shifting television services, bundled voice, data and video packages and, more recently, streaming services. In many cases, telcos are making significant infrastructure investments to expand their video offerings into IP services and gain market share, while certain telcos are also acquiring satellite and/or cable companies to achieve market reach and scale.

Broadcast and Media Companies

- Network broadcasters, programmers and content owners require video contribution and distribution solutions to transmit live programming of news and sports to their studios for subsequent broadcast, and deliver the same programming and content to service providers for distribution to their subscribers. Broadcasters generally produce their own news and sports highlight content, along with hundreds of channels of network programming that is played-to-air under strict reliability requirements using playout servers and software.
- With broadcast and media companies continuing to expand their offerings to support a wide range of live and linear content and making content available in higher quality video formats and on-demand, we believe these trends are accelerating demand for functionally collapsed playout systems with integrated media orchestration software, as well as increasing demand for media servers and video-optimized storage solutions equipped to support higher resolution formats. In addition, in order to achieve faster time-to-market and reduce operational costs, we believe content providers are adopting cloud-based technologies and transitioning portions of their operations into public cloud environments, thereby enabling expanded services at a more rapid pace, the distribution of video directly to consumers or to distributors over IP and public networks, and more efficient and scalable global operations.

5

Table of Content

- In the terrestrial broadcasting market, while broadcasters in various countries that have not yet completed converting from analog to digital transmission continue with change-over efforts, operators in numerous other countries around the world are adopting the next generation of digital transmission technologies, such as the DVB-T2 standard and ATSC 3.0 standards. The ongoing conversion from analog to digital transmission and the adoption of next-generation transmission standards provides the opportunity to deliver new channels, HD and Ultra HD services, premium content, and interactive services.

Over-the-Top (OTT)

- According to a 2017 Cisco study, IP video traffic accounts for a significant majority of Internet traffic globally, and video traffic will only continue to increase for the foreseeable future. We believe service providers and broadcast and media companies with OTT services and offerings will continue to require high-quality video processing solutions and new technologies in order to process and distribute large amounts of live and VOD content from a wide variety of sources to a broad array of consumer devices, and to optimize adaptive bitrate video streaming quality and bandwidth utilization.
- With the continued proliferation of OTT streaming content and program channels similar to channels currently available from service providers, monetizing this content through the use of national, regionalized and personalized advertising delivered to the varied devices of individual viewers has become a key area of focus for companies with OTT offerings. We believe OTT ad insertion and other related content customization solutions will continue to attract increased investments from OTT companies.

Emerging Markets

- With a growing middle class across emerging markets, we believe the Pay-TV business will continue to grow for the foreseeable future in the Asia Pacific region, South Asia, the Middle East, Africa and Central and South America. We currently derive a meaningful portion of our revenue from countries in emerging markets.
- Many consumers who are entering the middle class are now able to afford a monthly video service to gain access to their favorite programs and movies. We believe some of the leading video service providers serving emerging markets will experience high subscriber growth rates and may become worldwide industry leaders.
- We believe subscribers in these markets will demand increasingly sophisticated video services over time as consumer consumption trends in these markets track to those in more developed markets. A growing number of new regional OTT entrants in emerging markets, where global brands such as Netflix and Amazon's Prime Video are less dominant, are delivering a variety of OTT services and experiencing rapid growth. As a result, we believe that the infrastructure and technology investments of these service providers and new market entrants are likely to grow significantly for the foreseeable future.
- Media companies addressing emerging markets are aggressively investing in the creation of new content, particularly content that is localized and responsive to consumer demands, with the goal of creating strong brands and a growing, loyal customer base. We believe that this growth in content creation will require these media companies to significantly increase their capabilities in video storage, processing and related technologies.

Video Infrastructure Technology Trends

- Network Function Virtualization. We believe the industry will continue to adopt network function virtualization and unified video processing systems, whereby what had been historically discrete hardware video processing functions are integrated into software and run on the latest Intel processors in order to leverage high-performance and scalable appliance-based hardware, and as software-only virtual instances designed to run on private and/or public cloud environments.
- Unified Video Playout & Processing Systems. A unified video processing system requires software-based channel origination and playout capabilities, with integrated functionality such as graphics and branding insertion and media orchestration, and an integrated control system that streamlines playout processes, improves video quality, enables time-shift and cDVR functionality, while reducing server overhead. Also, when playout functionality is deployed to the cloud, the compression and OTT packaging and origin functionality (in addition to the capability to distribute over traditional broadcast distribution networks) associated with the playout will necessarily also need to be deployed in the cloud.
-

By combining historically discrete video chain functions into a unified playout and distribution system where content can be ingested, formatted, stored, played-to-air and compressed, packaged and delivered, we believe functionally collapsed video playout infrastructures with integrated control systems will enable content providers

Table of Content

to produce more channels in higher resolution formats faster and more cost-effectively, and provide content in the widest possible range of formats.

- Outsourcing of Video Infrastructure Functionality. We believe there is industry momentum for shifting virtualized and unified video processing infrastructure from broadcast center or production facilities to third party SaaS offerings hosted on public cloud infrastructure. We believe this transition enables media companies and new OTT entrants to more rapidly adapt to market dynamics, utilize A/B testing methodologies to optimize service offerings and expand within and beyond core markets.

Cable Access Business

Industry Challenges

Cable operators continue to face challenges from the rapid growth of demand for broadband bandwidth in their networks, driven primarily by:

- more users with more connected devices and applications;
- bundled digital video, voice and high speed data services; and
- bandwidth-intensive VOD and OTT streaming video services, and cloud applications.

In addition, the operation of network infrastructure is space, power and personnel intensive. Hardware-centric networks can also be expensive to update or replace. To remain competitive, especially in the face of heightened competition from non-cable service providers such as telcos to deliver gigabit data rates, cable operators need to significantly upgrade existing equipment and network technologies.

Technology Trends

- DOCSIS 3.1. We believe the cable industry will continue to deploy the DOCSIS 3.1 standard, which enables high bandwidth data transfer over existing broadband infrastructure.
- Virtualization. We believe cable operators are moving toward more software-driven architectures. Virtualized software solutions that are decoupled from underlying hardware and run on commercial off-the-shelf (COTS) servers and/or cloud architectures allow for significantly increased efficiencies, upgradability, configuration flexibility, service agility and scalability not feasible with hardware-centric approaches. We believe a software-based cable access solution can significantly reduce cable headend costs, especially costs related to physical space and power consumption, and increase operational efficiency, and that the deployment of these systems will be an important step in cable operators' transition to all-IP networks.
- Distributed Access Architecture. In addition to centralized cable access solutions, we believe there is growing interest in distributed Remote PHY solutions, particularly in competitive gigabit service markets where cable operators are competing with fiber-to-the-home (FTTH) services and are extending fiber networks deeper into their access networks. A Remote PHY architecture coupled with a software-based cable access solution running on COTS servers at a headend, and the distribution of Remote PHY nodes closer to end users, alleviates the power and space requirements of centralized systems at headend sites due to the fact that the RF processing is distributed into the field outside of the headend. We believe this distributed architecture will enable service providers to efficiently scale to support data and IP video growth.

Our Products and Solutions

Video Processing and Delivery Solutions

We offer a range of products and solutions that address the demand and market trends shaping our industry, including next-generation software-based media processing platforms. Our video processing solutions, which include network management software and application software and hardware products, provide our customers with the ability to acquire a variety of signals from different sources and in different protocols in order to deliver a variety of real-time and stored content to their subscribers for viewing on a broad range of devices.

Cloud media processing. An increasing number of service providers and media professionals are looking to cloud-based architectures for their media processing workflows, which is a fundamental shift from traditional, hardware-based approaches. We have addressed, and continue to address, this changing landscape with our VOS Cluster software application, which transforms traditional video processing and delivery architectures into a fully integrated set of cloud-native functions and enables ease of migration between data center computing, public clouds and private clouds, thereby accelerating the time to

7

Table of Content

market for new broadcast and OTT services. Our VOS360 offering provides these same capabilities in a public cloud environment, and maintenance operations of the VOS Cluster are the responsibility of Harmonic.

Broadcast and OTT encoders. Our high-performance encoders compress video, audio and data channels to low bit rates while maintaining high video quality. Our latest software-based Electra encoders can deliver video in multiple formats, including standard, HD and Ultra HD, and in any video compression standard, including MPEG-2, MPEG-4 AVC and HEVC. This capability allows the encoders to converge workflows targeted for all forms of video delivery, whether broadcast, cable, satellite, IPTV or OTT. Today's Electra and VOS solutions all leverage the same Harmonic PURE Compression Engine, a software-based technology that incorporates many of the encoding algorithm and processing techniques developed by Harmonic over the past two decades. The benefits of the PURE Compression Engine include a faster rate of video quality innovation, the ability to dynamically balance workflow efficiency and resource utilization, and improved investment protection. Our EyeQ real-time content-aware encoding solution is an optional enhancement for systems featuring PURE Compression. The EyeQ compression solution leverages the mechanics of the human eye to assess video quality and optimize encoding parameters in real time. Our VOS Cluster software application supports a subset of broadcast and OTT encoding functionality.

Contribution encoders. Our ViBE contribution encoders provide broadcasters with video compression solutions for real-time news gathering, live sports coverage and other remote events, and enable our customers to deliver these feeds to their studios for further processing. Our latest models can encode HD and Ultra HD video signals in HEVC or AVC 4:2:2 10-bit resolution, enabling the transmission of very high-quality video with very low latency.

High-density transcoders and stream processing. We offer high-density, real-time transcoding of video for broadcast and OTT delivery with our Electra XT Xtream transcoder. This modular and scalable platform is designed to cost effectively transcode any incoming audio and video signal at a "good enough" video quality. Our latest ProStream X and ProStream XVM real-time stream processing systems are software-based and provide high-performance, high-throughput processing for mission-critical IP video delivery applications, including multiplexing, scrambling, splicing and blackout switching. Our VOS Software Cluster software application supports stream processing.

Multiscreen delivery. Our VOS Cluster software application enables the packaging and delivery of high-quality OTT services, including live streaming, VOD, catch-up TV, start-over TV, nDVR and cDVR services through hypertext transfer protocol (HTTP) streaming to any device. Capabilities include real-time and file-based transcoding, stream packaging, and multiscreen workflow management, as well as support for digital rights management (DRM) processes with a number of DRM partners. Our VOS Cluster application ingests transcoded, segmented and encrypted output from Electra systems to provide high-volume live adaptive bitrate streaming and the delivery of time-shifted services.

Decoders and descramblers. Our family of ProView integrated receivers-decoder (IRD) products allows service providers to acquire content delivered via satellite, IP or terrestrial networks for distribution to their subscribers. These products, including the ProView 7100 and ProView 8100 series, are used by broadcasters to decode signals backhauled from live news and sporting events in contribution applications, as well as by content owners looking to distribute their content in a controlled manner to a large base of video service providers. Our VOS Cluster software applications support a subset of these decoding and descrambling capabilities.

Video servers. Our video playout solutions, including media orchestration software, are based on scalable video servers used by broadcast and media companies to create and playout television channels. Our Spectrum family of video server systems are used by broadcast and media companies to create play-to-air television channels. Our customers typically use these video server products to record incoming content from either live feeds or from tapes, encoding that content in real-time into standard media files that are then stored in the server's file system until the content is needed for playback as part of a scheduled playlist. Clips stored in the server are decoded in real-time and played-to-air according to a playout schedule in a frame-accurate, back-to-back manner to create a seamless television channel. Our Spectrum servers support SD, HD and Ultra HD programming, as well as many different media formats. Our Polaris media orchestration software solutions work with our Spectrum products and provide our customers with playout management and control tools for channel-in-a-box and integrated channel playout applications. Our VOS Cluster software application supports a subset of these video server functionalities.

Video-optimized Storage

MediaGrid. Our MediaGrid shared storage system is a scale-out, network-attached storage system with a built-in media file system optimized for media production workflows. Architected as a clustered storage system with a distributed file system, MediaGrid provides highly scalable storage capacity and access bandwidth to support demanding media production applications, such as video editing, content transformation and media library management. In addition, MediaGrid systems are increasingly being employed for VOD, time-shifted television services and OTT adaptive bitrate streaming. Our VOS Cluster

Table of Content

software application relies on external infrastructure for storage, and is compatible with MediaGrid video-optimized storage when deployed into a customer’s traditional data center environment.

Unified Video Playout and Processing SaaS

Cloud-native SaaS solutions. Our VOS360 SaaS solution provides the functionality of our VOS Cluster in public cloud environments and is designed to be deployable in any public cloud infrastructure. With the VOS360 service, the maintenance operations of the VOS Cluster are the responsibility of Harmonic.

Cable Access Products and Solutions

Software-Based Cable Access Solution. As demand continues to rapidly grow for high-speed broadband services such as OTT streaming, VOD, time-shift TV and cloud DVR, we believe we can help cable operators take advantage of this opportunity with our CableOS software-based cable access solution, an end-to-end cable access solution that we believe delivers unprecedented scalability, agility and cost savings. Our CableOS solution enables the migration to multi-gigabit broadband capacity and the fast deployment of DOCSIS 3.1 data, video and voice services. We believe our solution resolves space and power constraints in the headend and hub, eliminates dependence on hardware upgrade cycles, and reduces total cost of ownership. Our CableOS solution can be deployed based on a centralized, distributed Remote PHY or hybrid architecture.

Edge QAM products. Our Narrowcast Services Gateway (NSG) products are fully integrated edge gateway products that integrate routing, multiplexing, scrambling and modulation into a single package for the delivery of narrowcast services to subscribers over cable networks. NSG systems allow cable operators to deliver IP signals from the headend to the edge of the network for subsequent modulation onto a HFC network. Originally developed for VOD applications, the NSG has evolved to support multiple applications, including switched digital video and modular CMTS applications, as well as large-scale VOD deployments.

Since we historically have not addressed the CMTS market and 2018 was our first year of generating revenues in this new market, we believe that our CableOS solution, which includes a software-based CMTS, will have an opportunity to be sold into a significantly larger and growing market, with growth driven by virtualization and the distributed Remote PHY architecture.

Technical Support and Professional Services

We provide maintenance and support services to most of our customers under service level agreements that are generally renewed on an annual basis. We also provide consulting, implementation and integration services to our customers worldwide. We draw upon our expertise in broadcast television, communications networking and compression technology to design, integrate and install complete solutions for our customers, including integration with third-party products and services. We offer a broad range of services, including program management, technical design and planning, building and site preparation, integration and equipment installation, end-to-end system testing and comprehensive training.

Customers

We sell our products to a variety of cable, satellite and telco, and broadcast and media companies. Set forth below is a representative list of our significant end user and integrator/reseller customers, listed alphabetically, based, in part, on revenue during 2018.

United States	International
AT&T	Arquiva
Buckeye Cable	Bell TV
Charter Communications	Groupe Canal+
Comcast	Netorium
Cox Communications	SCSK Corp.
DigitalGlue	Sky Italia
Dish Network	Sky Perfect JSAT Corp.
GatesAir	Sony
Heartland Video Systems	Telecom Argentina
Turner Broadcasting	Vodafone

9

Sales to our 10 largest customers in 2018, 2017 and 2016 accounted for approximately 37%, 24% and 28% of our net revenue, respectively. Although we continue to seek to broaden our customer base by penetrating new markets and further expanding internationally, we expect to see continuing industry consolidation and customer concentration. During 2018, Comcast accounted for 15% of our net revenue. During 2017 and 2016, no single customer accounted for more than 10% of our net revenue. The loss of any significant customer, or any material reduction in orders from any significant customer, or our failure to qualify our new products with any significant customer could materially and adversely affect our operating results, financial condition and cash flows. In addition, we are involved in most quarters in one or more relatively large individual transactions. A decrease in the number of relatively larger individual transactions in which we are involved in any quarter could adversely affect our operating results for that quarter.

Sales and Marketing

In the U.S. and internationally, we sell our products through our own direct sales force, as well as through independent resellers and systems integrators. Our direct sales team is organized geographically and by major customers and markets to support customer requirements. Our principal sales offices outside of the U.S. are located in Europe and Asia, and we have a support center in Switzerland to support our international customers and operations. Our international resellers are generally responsible for importing our products and providing certain installation, technical support and other services to customers in their territory after receiving training from us.

Our direct sales force and resellers are supported by a highly trained technical staff, which includes application engineers who work closely with our customers to develop technical proposals and design systems to optimize system performance and economic benefits for our customers. Our technical support teams provide a customized set of services, as required, for ongoing maintenance, support-on-demand and training for our customers and resellers, both in our facilities and on-site.

Our product management organization develops strategies for product lines and markets and, in conjunction with our sales force, identifies the evolving technical and application needs of customers so that our product development resources can be most effectively and efficiently deployed to meet anticipated product requirements. Our product management organization is also responsible for setting price levels, demand forecasting and general support of the sales force, particularly at major accounts.

Our corporate marketing organization is responsible for building awareness of the Harmonic brand in our markets and driving engagement with our strategies, solutions and products. The group develops all of our corporate messaging and manages all customer and industry communication channels, including public relations, Web and social media, events and trade shows, as well as demand generation marketing campaigns in conjunction with our sales force.

Manufacturing and Suppliers

We rely on third-party contract manufacturers to assemble our products and the subassemblies and modules for our products. In 2003, we entered into an agreement with Plexus Services Corp. to act as our primary contract manufacturer. Plexus currently provides us with a majority, of the products we purchase from our contract manufacturers. This agreement has automatic annual renewals, unless prior notice for nonrenewal is given, and has been automatically renewed for a term expiring in October 2019. We do not generally maintain long-term agreements with any of our contract manufacturers.

Many components, subassemblies and modules necessary for the manufacture or integration of our products are obtained from a sole supplier or a limited group of suppliers. While we expend considerable efforts to qualify additional component sources, consolidation of suppliers in the industry and the small number of viable alternatives have limited the results of these efforts. We do not generally maintain long-term agreements with any of our suppliers.

Intellectual Property

As of December 31, 2018, we held 81 issued U.S. patents and 53 issued foreign patents and had 91 patent applications pending. Although we attempt to protect our intellectual property rights through patents, trademarks, copyrights, licensing arrangements, maintaining certain technology as trade secrets and other measures, we cannot assure you that any patent, trademark, copyright or other intellectual property rights owned by us will not be invalidated, circumvented or challenged, that such intellectual property rights will provide competitive advantages to us, or that any of our pending or future patent applications will be issued with the claims, or the scope of the claims, sought by us, if at all. We cannot assure you that others

Table of Content

will not develop technologies that are similar or superior to our technology, duplicate our technology or design around the patents that we own. In addition, effective patent, copyright and trade secret protection may be unavailable or limited in which we do business or may do business in the future.

We enter into confidentiality or license agreements with our employees, consultants, vendors and customers as needed, and generally limit access to, and distribution of, our proprietary information. However, no assurances can be given that these actions will prevent misappropriation of our technology. In addition, if necessary, we are prepared to take legal action, in the future, to enforce our patents and other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement or invalidity. Any such litigation could result in substantial costs and diversion of resources, including management time, and could negatively affect our business, operating results, financial position and cash flows.

In order to successfully develop and market our products, we may be required to enter into technology development or licensing agreements with third parties. Although many companies are often willing to enter into such technology development or licensing agreements, we cannot assure you that such agreements can be negotiated on reasonable terms or at all. The failure to enter into technology development or licensing agreements, when necessary, could limit our ability to develop and market new products and could harm our business.

Backlog

We schedule production of our products and solutions based upon our backlog, open contracts, informal commitments from customers and sales projections. Our backlog consists of unfilled firm purchase orders by our customers which have not been completed. Approximately 82% of our backlog is projected to be converted to revenue within a rolling one-year period. As of December 31, 2018 and 2017, we had backlog, including deferred revenue, of $186.4 million and $224.4 million, respectively. Delivery schedules on such orders may be deferred or canceled for a number of reasons, including reductions in spending by our customers or changes in specific customer requirements. In addition, due to annual budget cycles at many of our customers, the amount of our backlog at any given time is not necessarily indicative of actual revenues for any succeeding period.

Competition

The markets for video infrastructure systems are extremely competitive and have been characterized by rapid technological change and declining average selling prices. The principal competitive factors in these markets include product performance, functionality and features, reliability, pricing, breadth of product offerings, brand recognition and awareness, sales and distribution capabilities, technical support and services, and relationships with end customers. We believe that we compete favorably in each of these categories.

Large integrated system suppliers, such as Arris Group, Cisco Systems and Ericsson, with which we have historically competed in our Video business segment, announced sale and divestiture transactions in the last several months that impacted these companies’ video businesses: Arris announced a definitive agreement to be acquired by CommScope; Cisco Systems sold its video solutions group (now called Synamedia) to Permira, a private equity firm; and Ericsson completed the sale of a majority stake in its MediaKind video technology business to One Equity Partners, a private equity firm. In certain product lines, our competitors include companies such as ATEME and Elemental Technologies (an Amazon Web Services company). With respect to production and playout products, competitors include Evertz Microsystems, EVS, Grass Valley (a Belden brand) and Imagine Communications. In the OTT market, our competitors include end-to-end online video platforms such as Brightcove and Verizon Digital Media Services, who provide comprehensive OTT infrastructure solutions, some of which overlap with our products and services.

Our competitors in our Cable Access business include Arris, Casa Systems, Cisco Systems and Huawei Technologies.

Research and Development

We have historically devoted a significant amount of our resources to research and development. Research and development expenses in 2018, 2017 and 2016 were approximately $89.2 million, $96.0 million and $98.4 million, respectively. Research and development expenses as a percentage of revenue in 2018, 2017 and 2016 were approximately 22.1%, 26.8% and 24.2%, respectively. Our internal research and development activities are conducted primarily in the United States (California, Oregon and New Jersey), France, Israel and Hong Kong. In addition, a portion of our research and development is conducted through third-party partners with engineering resources in Ukraine and in India.

Table of Content

Our research and development program is primarily focused on developing new products and systems, and adding new features and other improvements to existing products and systems. Our development strategy is to identify features, products and systems, in both software and hardware solutions, that are, or are expected to be, needed by our customers. For our Video business segment, our current research and development efforts are focused on next-generation video processing and delivery across different deployment environments, particularly cloud-native and SaaS delivery models, and enhanced video compression, video quality, and multiscreen solutions. We also devote significant resources to production and playout and distribution solutions. With respect to our Cable Access business segment, our major research and development efforts are focused on cable access solutions for both video and data, particularly the ongoing development of our centralized and distributed CableOS software-based cable access solutions.

Our success in designing, developing, manufacturing and selling new or enhanced products will depend on a variety of factors, including the identification of market demand for new products, product selection, timely product design and development, product performance, effective manufacturing and assembly processes and sales and marketing. Because of the complexity inherent in such research and development efforts, we cannot assure you that we will successfully develop new products, or that new products developed by us will achieve market acceptance. Our failure to successfully develop and introduce new products would materially and adversely affect our business, operating results, financial condition and cash flows.

Employees

As of December 31, 2018, we employed a total of 1,162 full time employees, including 425 in research and development, 190 in sales, 293 in service and support, 57 in operations, 78 in marketing (corporate and product) and 119 in a general and administrative capacity. Of those employees, 375 were located in the U.S. and 787 employees were located in foreign countries in South America, the Middle East, Europe, Asia and Canada. From time to time, we also employ a number of temporary employees and consultants on a contract basis. Our employees in France are represented by labor unions and an employee works council. None of our other employees are represented by a labor union with respect to their employment with us. We have not experienced any work stoppages, and we consider our relations with our employees to be good.

Table of Content

Available Information

Harmonic makes available free of charge, on the Harmonic web site, the Company's Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K (via link to the SEC website, which itself is available at http://www.sec.gov), and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after Harmonic files such material with, or furnishes such material to, the Securities and Exchange Commission. The address of the Harmonic web site is http://www.harmonicinc.com. Except as expressly set forth in this Form 10-K, the contents of our web site are not incorporated into, or otherwise to be regarded as part of, this report.

Table of Content

Item 1A. RISK FACTORS

We depend on cable, satellite and telco, and broadcast and media industry spending for our revenue and any material decrease or delay in spending in any of these industries would negatively impact our operating results, financial condition and cash flows.

Our revenue has been derived from worldwide sales to service providers and broadcast and media companies, as well as, in recent years, streaming media companies. We expect that these markets will provide our revenue for the foreseeable future. Demand for our products will depend on the magnitude and timing of spending by customers in each of these markets for the purpose of creating, expanding or upgrading their systems. These spending patterns are dependent on a variety of factors, including:

- the impact of general economic conditions, actual and projected;
- access to financing;
- annual budget cycles of customers in each of the industries we serve;
- the impact of industry consolidation;
- customers suspending or reducing spending in anticipation of: (i) new video or cable industry standards; (ii) industry trends and technology shifts, such as virtualization and cloud-based solutions, and (iii) new products, such as products and services based on our VOS software platform or our CableOS software-based cable access solution;
- delayed or reduced spending as customers transition to or contemplate adopting new business and operating models enabled by software- and cloud-based solutions, including software-as-a-service (SaaS) unified video processing solutions;
- federal, state, local and foreign government regulation of telecommunications, television broadcasting and streaming media;
- overall demand for communication services and consumer acceptance of new video and data technologies and services;
- competitive pressures, including pricing pressures;
- the impact of fluctuations in currency exchange rates; and
- discretionary end-user customer spending patterns.

In the past, specific factors contributing to reduced spending have included:

- weak or uncertain economic and financial conditions in the U.S. or one or more international markets;
- uncertainty related to development of digital video industry standards;
- delays in evaluations of new services, new standards and systems architectures by many operators;
- emphasis by operators on generating revenue from existing customers, rather than from new customers, through construction, expansion or upgrades;

• a reduction in the amount of capital available to finance projects of our customers and potential customers;

• proposed and completed business combinations and divestitures by our customers and the length of regulatory review of each;

• completion of a new system or significant expansion or upgrade to a system; and

Table of Content

• bankruptcies and financial restructuring of major customers.

In the past, adverse economic conditions in one or more of the geographies in which we offer our products have adversely affected our customers' spending in those geographies and, as a result, our business. During challenging economic times, and in tight credit markets, many customers may delay or reduce capital expenditures. This could result in reductions in revenue from our products, longer sales cycles, difficulties in collection of accounts receivable, slower adoption of new technologies and increased price competition. If global economic and market conditions, or economic conditions in the U.S., Europe or other key markets, deteriorate, we could experience a material and adverse effect on our business, results of operations, financial condition and cash flows. Additionally, since most of our international revenue is denominated in U.S. dollars, global economic and market conditions may impact currency exchange rates and cause our products to become relatively more expensive to customers in a particular country or region, which could lead to delayed or reduced spending in those countries or regions, thereby negatively impacting our business and financial condition.

In addition, industry consolidation has in the past constrained, and may in the future constrain or delay, spending by our customers. Further, if our product portfolio and product development plans do not position us well to capture an increased portion of the spending of customers in the markets on which we focus, our revenue may decline.

As a result of these various factors and potential issues related to customer spending, we may not be able to maintain or increase our revenue in the future, and our operating results, financial condition and cash flows could be materially and adversely affected.

The markets in which we operate are intensely competitive.

The markets for our products are extremely competitive and have been characterized by rapid technological change and declining average sales prices in the past.

Large integrated system suppliers, such as Arris Group, Cisco Systems and Ericsson, with which we have historically competed in our Video business segment, announced sale and divestiture transactions in the last several months that impacted these companies' video businesses: Arris announced a definitive agreement to be acquired by CommScope; Cisco Systems sold its video solutions group (now called Synamedia) to Permira, a private equity firm; and Ericsson completed the sale of a majority stake in its MediaKind video technology business to One Equity Partners, a private equity firm. In certain product lines, our competitors include companies such as ATEME and Elemental Technologies (an Amazon Web Services company). With respect to production and playout products, competitors include Evertz Microsystems, EVS, Grass Valley (a Belden brand) and Imagine Communications. In the OTT market, our competitors include end-to-end online video platforms such as Brightcove and Verizon Digital Media Services, who provide comprehensive OTT infrastructure solutions, some of which overlap with our products and services. Our competitors in our Cable Access business include Arris, Casa Systems, Cisco Systems and Huawei Technologies.

A number of our principal business competitors in both of our business segments are substantially larger and/or may have access to greater financial, technical, marketing and other resources than we have. Consolidation in the Video industry has led to the acquisition of a number of our historic competitors over the last several years by substantially larger companies and private equity firms. With respect to our Cable Access business, our competitors are also substantially larger than us, and the pending acquisition of Arris by CommScope will create a significantly larger combined business.

In addition, some of our larger competitors have more long-standing and established relationships with domestic and foreign customers. Many of these large enterprises are in a better position to withstand any significant reduction in spending by customers in our markets. They often have broader product lines and market focus, and may not be as susceptible to downturns in a particular market. These competitors may also be able to bundle their products together to meet the needs of a particular customer, and may be capable of delivering more complete solutions than we are able to provide. To the extent large enterprises that currently do not compete directly with us choose to enter our markets by acquisition or otherwise, competition would likely intensify.

Further, some of our competitors that have greater financial resources have offered, and in the future may offer, their products at lower prices than we offer for our competing products or on more attractive financing or payment terms, which has in the past caused, and may in the future cause, us to lose sales opportunities and the resulting revenue or to reduce our prices in response to that competition. Also, some competitors that are smaller than we are have engaged in, and may continue to engage in, aggressive price competition in order to gain customer traction and market share. Reductions in prices for any of our products could materially and adversely affect our operating margins and revenue.

Table of Content

Additionally, certain customers and potential customers have developed, and may continue to develop, their own solutions that may cause such customers or potential customers to not consider our product offerings or to displace our installed products with their own solutions. The growing availability of open source codecs and related software, as well as new server chipsets that incorporate encoding technology, has, in certain respects, lowered the barriers to entry for the video processing industry. The development of solutions by potential and existing customers and the reduction of the barriers to entry to enter the video processing industry could result in increased competition and adversely affect our results of operations and business.

If any of our competitors' products or technologies were to become the industry standard, our business could be seriously harmed. If our competitors are successful in bringing their products to market earlier than us, or if these products are more technologically capable than ours, our revenue could be materially and adversely affected.

We need to develop and introduce new and enhanced products in a timely manner to meet the needs of our customers and to remain competitive.

All of the markets we address are characterized by continuing technological advancement, changes in customer requirements and evolving industry standards. To compete successfully, we must continually design, develop, manufacture and sell new or enhanced products that provide increasingly higher levels of performance and reliability and meet our customers changing needs. However, we may not be successful in those efforts if, among other things, our products:

- are not cost effective;

- are not brought to market in a timely manner;

- are not in accordance with evolving industry standards;

- fail to meet market acceptance or customer requirements; or

- are ahead of the needs of their markets.

We are currently developing and marketing products based on the latest video compression standards, such as HEVC, which provides significantly greater compression efficiency, thereby making more bandwidth available to operators. At the same time, we continue to devote development resources to enhance the existing AVC/H.264 compression of our products, which many of our customers continue to require. There can be no assurance that these efforts will be successful in the near future, or at all, or that our competitors will not take significant market share in encoding or transcoding.

We continue to focus our development efforts on key product solutions in our Video and Cable Access businesses. Our VOS solution is a software-based, cloud-enabled platform that unifies the entire media processing chain, from ingest to delivery. We have launched a number of VOS-based product solutions and services, including our VOS Cluster and VOS360 SaaS solutions, and continue to develop and expand the capabilities of our VOS software platform. In our Cable Access business, we have launched and continue to develop our CableOS software-based cable access solutions.

Many of these products and initiatives are intended to integrate existing and new features and functions in response to shifts in customer demands in the relevant market, as well as to general technology trends that we believe will significantly impact our industry. The success of these significant and costly development efforts will be predicated, for certain products and initiatives, on the timing of market adoption of the new standards on which the resulting products are based, and for other products, the timing of customer adoption of our products and solutions, as well as our ability to timely develop the features and capabilities of our products and solutions. If new standards or some of our new products are adopted later than we predict or not adopted at all, or if adoption occurs earlier than we are able to deliver the applicable products or functionality, we risk spending significant research and development time and dollars on products or features that may never achieve market acceptance or that miss the customer demand window and thus do not produce the revenue that a timely introduction would have likely produced.

If we fail to develop and market new and enhanced products on a timely basis, our operating results, financial condition and cash flows could be materially and adversely affected.

Our software-based cable access product initiatives expose us to certain technology transition risks that may adversely impact our operating results, financial condition and cash flows.

We believe our CableOS software-based cable access solutions, supporting centralized, distributed Remote PHY or hybrid configurations, will significantly reduce cable headend costs and increase operational efficiency, and are an important step in cable operators' transition to all-IP networks. If we are unsuccessful in developing and deploying our cable access solutions in a timely manner, or are otherwise delayed in making our solutions available to our customers, our business may be adversely impacted, particularly if our competitors develop and market similar products and solutions before we do.

We believe software-based cable access solutions will, over time, replace and make obsolete current CMTS solutions, which is a market our products have historically not addressed, as well as cable edge-QAM products. If demand for our software-based cable access solutions is weaker than expected, , our near and long-term operating results, financial condition and cash flows could be adversely impacted. Further, in September 2016 we granted Comcast a warrant (the "Warrant") to purchase shares of our common stock to further incentivize them to purchase our products and adopt our technologies, particularly our CableOS software-based cable access solution. If Comcast deploys our CableOS solution in its networks more slowly than we anticipate or at a scale below our expectations, we may be unable to fully realize the anticipated benefits of our relationship with Comcast and our business and operating results, financial condition and cash flows could be materially and adversely affected. Moreover, if competitors adapt new cable industry technology standards into competing cable access solutions faster than we do, or promulgate a new or competitive architecture for next-generation cable access solutions that renders our CableOS solution obsolete, our business may be adversely impacted.

The sales cycle for our CableOS solutions tends to be long. For cable operators, upgrading or expanding network infrastructure is complex and expensive, and investing in a CableOS solution is a significant strategic decision that may require considerable time to evaluate, test and qualify. Potential customers need to ensure our CableOS solution will interoperate with the various components of its existing network infrastructure, including third-party equipment, servers and software. In addition, since we are a relatively new entrant into the CMTS market, we need to demonstrate significant performance, functionality and/or cost advantages with our CableOS solutions that outweigh customer switching costs. If sales cycles are significantly longer than anticipated or we are otherwise unsuccessful in growing our CableOS sales, our operating results, financial condition and cash flows could be materially and adversely affected.

Our future growth depends on market acceptance of several broadband services, on the adoption of new broadband technologies, and on several other broadband industry trends.

Future demand for many of our products will depend significantly on the growing market acceptance of emerging broadband services, including digital video, VOD, Ultra HD, IP video services (particularly streaming to tablet computers, connected TVs and mobile devices) and very high-speed data services. The market demand for such emerging services is rapidly growing, with many custom or proprietary systems in use, which increases the challenge of delivering interoperable products intended to address the requirements of such services.

The effective delivery of these services will depend, in part, on a variety of new network architectures, standards and devices, such as:

• the adoption of cloud-native media processing architectures;

• the adoption of advanced video compression standards, such as next generation H.264 compression and HEVC;

• the adoption of our cable access solutions;

• fiber to the premises, or FTTP, networks designed to facilitate the delivery of video services by telcos;

• the greater use of protocols such as IP;

• the further adoption of bandwidth-optimization techniques, such as DOCSIS 3.0 and DOCSIS 3.1 and associated specifications; and

• the introduction of new consumer devices, such as advanced set-top boxes, cloud DVRs, connected TVs, tablet computers, and a variety of smart phone mobile devices.

If adoption of these emerging services and/or technologies is not as widespread or as rapid as we expect, or if we are unable to develop new products based on these technologies on a timely basis, our operating results, financial condition and cash flows could be materially and adversely affected.

Furthermore, other technological, industry and regulatory trends and requirements may affect the growth of our business.

Table of Content

These trends and requirements include the following:

• convergence, whereby network operators bundle video, voice and data services to consumers, including mobile delivery options;

• the increasing availability of traditional broadcast video content and video-on-demand on the Internet;

• adoption of high-bandwidth technology, such as DOCSIS 3.x, next generation LTE and FTTP;

• the use of digital video by businesses, governments and educational institutions;

• efforts by regulators and governments in the U.S. and internationally to encourage the adoption of broadband and digital technologies, as well as to regulate broadband access and delivery;

• consumer interest in higher resolution video such as Ultra HD or retina-display technologies on mobile devices;

• the need to develop partnerships with other companies involved in video infrastructure workflow and broadband services;

• the continued adoption of the television viewing behaviors of consumers in developed economies by the growing middle class across emerging economies;

• the extent and nature of regulatory attitudes towards issues such as network neutrality, competition between operators, access by third parties to networks of other operators, local franchising requirements for telcos to offer video, and other new services, such as mobile video; and

• the outcome of disputes and negotiations between content owners and service providers regarding rights of service providers to store and distribute recorded broadcast content, which outcomes may drive adoption of one technology over another in some cases.

If we fail to recognize and respond to these trends, by timely developing products, features and services required by these trends, we are likely to lose revenue opportunities and our operating results, financial condition and cash flows could be materially and adversely affected.

We depend significantly on our international revenue and are subject to the risks associated with international operations, including those of our resellers, contract manufacturers and outsourcing partners, which may negatively affect our operating results.

Revenue derived from customers outside of the U.S. in the fiscal years ended December 31, 2018, 2017 and 2016 represented approximately 55%, 63% and 58% of our revenue, respectively. Although no assurance can be given with respect to international sales growth in any one or more regions, we expect that international revenue will likely continue to represent, from year to year, a majority, and potentially increasing, percentage of our annual revenue for the foreseeable future. A significant percentage of our revenue is generated from sales to resellers, value-added resellers (“VARs”) and systems integrators, particularly in emerging market countries. Furthermore, the majority of our employees are based in our international offices and locations, and most of our contract manufacturing occurs outside of the U.S. In addition, we outsource a portion of our research and development activities to certain third-party partners with development centers located in different countries, particularly Ukraine and India.

Our international operations, the international operations of our resellers, contract manufacturers and outsourcing partners, and our efforts to maintain and increase revenue in international markets are subject to a number of risks, which are generally greater with respect to emerging market countries, including the following:

• growth and stability of the economy in one or more international regions;

• fluctuations in currency exchange rates;

• changes in foreign government regulations and telecommunications standards;

Table of Content

• import and export license requirements, tariffs, taxes, economic sanctions, contractual limitations and other trade barriers;

• our significant reliance on resellers and others to purchase and resell our products and solutions, particularly in emerging market countries;

• availability of credit, particularly in emerging market countries;

• longer collection periods and greater difficulty in enforcing contracts and collecting accounts receivable, especially from smaller customers and resellers, particularly in emerging market countries;

• compliance with the U.S. Foreign Corrupt Practices Act (the "FCPA"), the U.K. Bribery Act and/or similar anti-corruption and anti-bribery laws, particularly in emerging market countries;

• the burden of complying with a wide variety of foreign laws, treaties and technical standards;

• fulfilling "country of origin" requirements for our products for certain customers;

• difficulty in staffing and managing foreign operations;

• business and operational disruptions or delays caused by political, social and economic instability and unrest, including risks related to terrorist activity, particularly in emerging market countries (e.g., recent significant civil, political and economic disturbances in Ukraine);

• changes in economic policies by foreign governments, including the imposition and potential continued expansion of economic sanctions by the U.S. and the European Union on the Russian Federation;

• changes in diplomatic and trade relationships, including the imposition of new trade restrictions, trade protection measures, import or export requirements, trade embargoes and other trade barriers, including those imposed by the U.S. against China;

• any negative economic impacts resulting from the political environment in the U.S. or the U.K.'s referendum to exit the European Union; and

• business and economic disruptions and delays caused by outbreaks of disease, epidemics and potential pandemics.

We have certain international customers who are billed in their local currency, primarily the Euro, British pound and Japanese yen, which subjects us to foreign currency risk. In addition, a portion of our operating expenses relating to the cost of certain international employees, are denominated in foreign currencies, primarily the Euro, Israeli shekel, British pound, Singapore dollar, Chinese yuan and Indian rupee. Although we do hedge against the Euro, British pound, Israeli shekel and Japanese yen, gains and losses on the conversion to U.S. dollars of accounts receivable, accounts payable and other monetary assets and liabilities arising from international operations may contribute to fluctuations in our operating results. Furthermore, payment cycles for international customers are typically longer than those for customers in the U.S. Unpredictable payment cycles could cause us to fail to meet or exceed the expectations of security analysts and investors for any given period.

Most of our international revenue is denominated in U.S. dollars, and fluctuations in currency exchange rates could cause our products to become relatively more expensive to customers in a particular country or region, leading to a reduction in revenue or profitability from sales in that country or region. The potential negative impact of a strong

U.S. dollar on our business may be exacerbated by the significant devaluation of a number of foreign currencies. Also, if the U.S. dollar were to weaken against many foreign currencies, there can be no assurance that a weaker dollar would lead to growth in customer spending in foreign markets.

Our operations outside the U.S. also require us to comply with a number of U.S. and international regulations that prohibit improper payments or offers of payments to foreign governments and their officials and political parties for corrupt purposes. For example, our operations in countries outside the U.S. are subject to the FCPA and similar laws, including the U.K. Bribery Act. Our activities in certain emerging countries create the risk of unauthorized payments or offers of payments by one of our employees, consultants, sales agents or channel partners that could be in violation of various anti-corruption laws, even though these parties may not be under our control. Under the FCPA and U.K. Bribery Act, companies may be held liable for the corrupt actions taken by their directors, officers, employees, channel partners, sales agents, consultants, or other strategic or local

Table of Content

partners or representatives. We have internal control policies and procedures with respect to FCPA compliance, have implemented FCPA training and compliance programs for our employees, and include in our agreements with resellers a requirement that those parties comply with the FCPA. However, we cannot provide assurances that our policies, procedures and programs will prevent violations of the FCPA or similar laws by our employees or agents, particularly in emerging market countries, and as we expand our international operations. Any such violation, even if prohibited by our policies, could result in criminal or civil sanctions against us.

The effect of one or more of these international risks could have a material and adverse effect on our business, financial condition, operating results and cash flows.

We purchase several key components, subassemblies and modules used in the manufacture or integration of our products from sole or limited sources, and we rely on contract manufacturers and other subcontractors.

Many components, subassemblies and modules necessary for the manufacture or integration of our products are obtained from a sole supplier or a limited group of suppliers. For example, we depend on two suppliers for certain video encoding chips which are incorporated into several products. Our reliance on sole or limited suppliers, particularly foreign suppliers, and our reliance on contractors for manufacturing and installation of our products, involves several risks, including a potential inability to obtain an adequate supply of required components, subassemblies or modules; reduced control over costs, quality and timely delivery of components, subassemblies or modules; supplier discontinuation of components, subassemblies or modules we require; and timely installation of products. In addition, our financial results may be impacted by tariffs imposed by the U.S. on goods from other countries and tariffs imposed by other countries on U.S. goods, including the tariffs proposed by the U.S. government on various imports from China and by the Chinese government on certain U.S. goods, the scope and duration of which, if implemented, remain uncertain. If any such tariffs are imposed on products or components that we import, including those obtained from a sole supplier or a limited group of suppliers, we could experience reduced revenues or may have to raise our prices, either of which could have an adverse effect on our business, financial condition and operating results.

These risks could be heightened during a substantial economic slowdown, because our suppliers and subcontractors are more likely to experience adverse changes in their financial condition and operations during such a period. Further, these risks could materially and adversely affect our business if one of our sole sources, or a sole source of one of our suppliers or contract manufacturers, is adversely affected by a natural disaster. While we expend resources to qualify additional component sources, consolidation of suppliers and the small number of viable alternatives have limited the results of these efforts. Managing our supplier and contractor relationships is particularly difficult during time periods in which we introduce new products and during time periods in which demand for our products is increasing, especially if demand increases more quickly than we expect.

Plexus Services Corp., which manufactures our products at its facilities in Malaysia, currently serves as our primary contract manufacturer, and currently provides us with a majority, by dollar amount, of the products that we purchase from our contract manufacturers. Most of the products manufactured by our French and Israeli operations are outsourced to another third-party manufacturer in France and Israel, respectively. From time to time we assess our relationship with our contract manufacturers, and we do not generally maintain long-term agreements with any of our suppliers or contract manufacturers. Our agreement with Plexus has automatic annual renewals, unless prior notice is given by either party, and has been automatically renewed for a term expiring in October 2019.

Difficulties in managing relationships with any of our current contract manufacturers, particularly Plexus, that manufacture our products off-shore, or any of our suppliers of key components, subassemblies and modules used in our products, could impede our ability to meet our customers’ requirements and adversely affect our operating results. An inability to obtain adequate and timely deliveries of our products or any materials used in our products, or the inability of any of our contract manufacturers to scale their production to meet demand, or any other circumstance that would require us to seek alternative sources of supply, could negatively affect our ability to ship our products on a timely basis, which could damage relationships with current and prospective customers and harm our business and materially and adversely affect our revenue and other operating results. Furthermore, if we fail to meet customers' supply expectations, our revenue would be adversely affected and we may lose sales opportunities, both short and long term, which could materially and adversely affect our business and our operating results, financial condition and cash flows. Increases, from time to time, in demand on our suppliers and subcontractors from our customers or from other parties have, on occasion, caused delays in the availability of certain components and products. In response, we may increase our inventories of certain components and products and expedite shipments of our products when necessary. These actions could increase our costs and could also increase our risk of holding obsolete or excess inventory, which, despite our use of a demand order fulfillment model, could materially and adversely affect our business, operating results, financial condition and cash flows.

Table of Content

The loss of one or more of our key customers, a failure to continue diversifying our customer base, or a decrease in the number of larger transactions could harm our business and our operating results.

Historically, a significant portion of our revenue has been derived from relatively few customers, due in part to the consolidation of media customers. Sales to our top 10 customers in the fiscal years ended December 31, 2018, 2017 and 2016 accounted for approximately 37%, 24% and 28% of revenue, respectively. Although we have broadened our customer base by further penetrating new markets and expanding internationally, we expect to see continuing industry consolidation and customer concentration.

In the fiscal year ended December 31, 2018, Comcast accounted for 15% of our net revenue. In the fiscal year ended December 31, 2017 and 2016, no single customer accounted for more than 10% of our net revenue. Further consolidation in the cable industry could lead to additional revenue concentration for us. The loss of any significant customer, or any material reduction in orders from any other significant customer, or our failure to qualify our new products with any significant customer could materially and adversely affect, either long term or in a particular quarter, our operating results, financial condition and cash flows. Further, if Comcast Cable does not continue to increase its deployment of our products and solutions in connection with the Warrant we issued to them in September 2016, or does so more slowly or at a scale that is lower than we anticipate, we may be unable to realize the anticipated benefits of the Warrant and our operating results, financial condition and cash flows could be materially and adversely effected.

In addition, we are involved in most quarters in one or more relatively large individual transactions. A decrease in the number of the relatively larger individual transactions in which we are involved in any quarter could materially and adversely affect our operating results for that quarter.

As a result of these and other factors, we may be unable to increase our revenues from some or all of the markets we address, or to do so profitably, and any failure to increase revenues and profits from these customers could materially and adversely affect our operating results, financial condition and cash flows.

We rely on resellers, value-added resellers and systems integrators for a significant portion of our revenue, and disruptions to, or our failure to develop and manage our relationships with these customers or the processes and procedures that support them could adversely affect our business.

We generate a significant percentage of our revenue through sales to resellers, VARs and systems integrators that assist us with fulfillment or installation obligations. We expect that these sales will continue to generate a significant percentage of our revenue in the future. Accordingly, our future success is highly dependent upon establishing and maintaining successful relationships with a variety of channel partners.

We generally have no long-term contracts or minimum purchase commitments with any of our reseller, VAR or system integrator customers, and our contracts with these parties do not prohibit them from purchasing or offering products or services that compete with ours. Our competitors may provide incentives to any of our reseller, VAR or systems integrator customers to favor their products or, in effect, to prevent or reduce sales of our products. Any of our reseller, VAR or systems integrator customers may independently choose not to purchase or offer our products. Many of our resellers, and some of our VARs and system integrators are small, are based in a variety of international locations, and may have relatively unsophisticated processes and limited financial resources to conduct their business. Any significant disruption of our sales to these customers, including as a result of the inability or unwillingness of these customers to continue purchasing our products, or their failure to properly manage their business with respect to the purchase of, and payment for, our products, or their ability to comply with our policies and procedures as well as applicable laws, could materially and adversely affect our business, operating results, financial condition and cash flows. In addition, our failure to continue to establish or maintain successful relationships with reseller, VAR and systems integrator customers could likewise materially and adversely affect our business, operating results, financial condition and cash flows.

We have made, and may continue to make, acquisitions, and any acquisition could disrupt our operations, cause dilution to our stockholders and materially and adversely affect our business, operating results, cash flows and financial condition.

As part of our business strategy, from time to time we have acquired, and we may continue to acquire, businesses, technologies, assets and product lines that we believe complement or expand our existing business. For example, in February 2016, we announced the closing of our acquisition of TVN, which is headquartered in Rennes, France. Acquisitions involve numerous risks, including the following:

• unanticipated costs or delays associated with an acquisition;

Table of Content

• difficulties in the assimilation and integration of acquired operations, technologies and/or products;

• potential disruption of our business and the diversion of management’s attention from the regular operations of the business during the acquisition process;

• the challenges of managing a larger and more geographically widespread operation and product portfolio after the closing of the acquisition;

• potential adverse effects on new and existing business relationships with suppliers, contract manufacturers, resellers, partners and customers;

• compliance with regulatory requirements, such as local employment regulations and organized labor in France;

• risks associated with entering markets in which we may have no or limited prior experience;

• the potential loss of key employees of acquired businesses and our own business as a result of integration;

• difficulties in bringing acquired products and businesses into compliance with applicable legal requirements in jurisdictions in which we operate and sell products;

• impact of known potential liabilities or unknown liabilities, including litigation and infringement claims, associated with companies we acquire;

• substantial charges for acquisition costs or for the amortization of certain purchased intangible assets, deferred stock compensation or similar items;

• substantial impairments to goodwill or intangible assets in the event that an acquisition proves to be less valuable than the price we paid for it;

• difficulties in establishing and maintaining uniform financial and other standards, controls, procedures and policies;

• delays in realizing, or failure to realize, the anticipated benefits of an acquisition; and

• the possibility that any acquisition may be viewed negatively by our customers or investors or the financial markets.

Competition within our industry for acquisitions of businesses, technologies, assets and product lines has been, and is likely to continue to be, intense. As such, even if we are able to identify an acquisition that we would like to consummate, we may not be able to complete the acquisition on commercially reasonable terms or because the target chooses to be acquired by another company. Furthermore, in the event that we are able to identify and consummate any future acquisitions, we may, in each of those acquisitions:

• issue equity securities which would dilute current stockholders’ percentage ownership;

• incur substantial debt to finance the acquisition or assume substantial debt in the acquisition;

• incur significant acquisition-related expenses;

• assume substantial liabilities, contingent or otherwise; or

• expend significant cash.

These financing activities or expenditures could materially and adversely affect our operating results, cash flows and financial condition or the price of our common stock. Alternatively, due to difficulties in the capital or credit markets at the time, we may be unable to secure capital necessary to complete an acquisition on reasonable terms, or at all. Moreover, even if we were to obtain benefits from acquisitions in the form of increased revenue and earnings per share, there may be a delay between the time the expenses associated with an acquisition are incurred and the time we recognize such benefits.

Table of Content

In addition to the risks outlined above, if we are unable to successfully receive payment of any significant portion of TVN's existing French R&D tax credit receivables from the French tax authority as expected, or are unable to successfully apply for or otherwise obtain the financial benefit of new French R&D tax credits in future years, our ability to achieve the anticipated benefits of the acquisition as well as our business, operating results and financial condition could be adversely affected.

As of December 31, 2018, we had approximately $241 million of goodwill recorded on our balance sheet associated with prior acquisitions. In the event we determine that our goodwill is impaired, we would be required to write down all or a portion of such goodwill, which could result in a material non-cash charge to our results of operations in the period in which such write-down occurs.

If we are unable to successfully address one or more of these risks, our business, operating results, financial condition and cash flows could be materially and adversely affected.

We may not be able to effectively manage our operations.

In recent years, we have expanded our international operations significantly. For example, upon the closing of our acquisition of TVN on February 29, 2016, we added 438 employees, most of whom are based in France.

As of December 31, 2018, we had 787 employees in our international operations, representing approximately 68% of our worldwide workforce. Our ability to manage our business effectively in the future, including with respect to any future growth, our operation as both a hardware and increasingly software-centric business, the integration of any acquisition efforts such as our recent acquisition of TVN, and the breadth of our international operations, will require us to train, motivate and manage our employees successfully, to attract and integrate new employees into our overall operations, to retain key employees and to continue to improve and evolve our operational, financial and management systems. There can be no assurance that we will be successful in any of these efforts, and our failure to effectively manage our operations could have a material and adverse effect on our business, operating results, cash flows and financial condition.

We face risks associated with having outsourced engineering resources located in Ukraine.

We outsource a portion of our research and development activities for both our Video and Cable Access business segments to a third-party partner with engineering resources located in Ukraine. Political, social and economic instability and unrest or violence in Ukraine, including the ongoing conflict with Russian-backed separatists or conflict with the Russian Federation directly, could cause disruptions to the business and operations of our outsourcing partner, which could slow or delay the development work our partner is undertaking for us. Instability, unrest or conflict could limit or prevent our employees from traveling to, from, or within Ukraine to direct and coordinate our outsourced engineering teams, or cause us to shift all or portions of the development work occurring in Ukraine to other locations or countries. The resulting delays could negatively impact our product development efforts, operating results and our business.

In order to manage our growth, we must be successful in addressing management succession issues and attracting and retaining qualified personnel.

Our future success will depend, to a significant extent, on the ability of our management to operate effectively, both individually and as a group. We must successfully manage transition and replacement issues that may result from the departure or retirement of members of our executive management. We cannot provide assurances that changes of management personnel in the future would not cause disruption to operations or customer relationships or a decline in our operating results.

We are also dependent on our ability to retain and motivate our existing highly qualified personnel, in addition to attracting new highly qualified personnel. Competition for qualified management, technical and other personnel is often intense, particularly in Silicon Valley, Israel and Hong Kong where we have significant research and development activities, and we may not be successful in attracting and retaining such personnel. Competitors and others have in the past attempted, and are likely in the future to attempt, to recruit our employees. While our employees are required to sign standard agreements concerning confidentiality, non-solicitation and ownership of inventions, we generally do not have non-competition agreements with our personnel. The loss of the services of any of our key personnel, the inability to attract or retain highly qualified personnel in the future or delays in hiring such personnel, particularly senior management and engineers and other technical personnel, could negatively affect our business and operating results. Furthermore, a certain portion of our personnel in the U.S. is comprised of foreign nationals whose ability to work for us depends on obtaining the necessary visas. Our ability to hire and retain foreign nationals in the U.S., and their ability to remain and work in the U.S., is affected by various laws and regulations,

Table of Content

including limitations on the availability of visas. Changes in U.S. laws or regulations affecting the availability of visas may adversely affect our ability to hire or retain key personnel and as a result may impair our operations.

We face risks associated with having facilities and employees located in Israel.

As of December 31, 2018, we maintained facilities in Israel with a total of 168 employees, or approximately 14% of our worldwide workforce. Our employees in Israel engage in a number of activities, for both our Video and Cable Access business segments, including research and development, product development, and supply chain management for certain product lines and sales activities.

As such, we are directly affected by the political, economic and military conditions affecting Israel. Any significant conflict involving Israel could have a direct effect on our business or that of our Israeli contract manufacturers, in the form of physical damage or injury, restrictions from traveling or reluctance to travel to from or within Israel by our Israeli and other employees or those of our subcontractors, or the loss of Israeli employees to active military duty. Most of our employees in Israel are currently obligated to perform annual reserve duty in the Israel Defense Forces, and approximately 11% of those employees were called for active military duty in 2018. In the event that more of our employees are called to active duty, certain of our research and development activities may be significantly delayed and adversely affected. Further, the interruption or curtailment of trade between Israel and its trading partners, as a result of terrorist attacks or hostilities, conflicts between Israel and any other Middle Eastern country or organization, or any other cause, could significantly harm our business. Additionally, current or future tensions or conflicts in the Middle East could materially and adversely affect our business, operating results, financial condition and cash flows.

Our operating results are likely to fluctuate significantly and, as a result, may fail to meet or exceed the expectations of securities analysts or investors, causing our stock price to decline.

Our operating results have fluctuated in the past and are likely to continue to fluctuate in the future, on an annual and a quarterly basis, as a result of several factors, many of which are outside of our control. Some of the factors that may cause these fluctuations include:

• the level and timing of spending of our customers in the U.S., Europe and in other markets;

• economic and financial conditions specific to each of the cable, satellite and telco, and broadcast and media industries, as well as general economic and financial market conditions, including any stemming from an unstable political environment in the United States or abroad as well as those resulting from regulatory, trade or tax policy changes from the Tax Cuts and Jobs Act that was enacted in December 2017 (the “TCJA”);

• changes in market acceptance of and demand for our products or our customers’ services or products;

• the timing and amount of orders, especially from large individual transactions and transactions with our significant customers;

• the mix of our products sold and the effect it has on gross margins;

• the timing of revenue recognition, including revenue recognition on sales arrangements and from transactions with significant service and support components, which may span several quarters;

• our transition to a SaaS subscription model for our Video business, which may cause near-term declines in revenue;

• the timing of completion of our customers’ projects;

• the length of each customer product upgrade cycle and the volume of purchases during the cycle;

• competitive market conditions, including pricing actions by our competitors;

• the level and mix of our domestic and international revenue;

• new product introductions by our competitors or by us;

Table of Content

- uncertainty in both the U.K. and the European Union due to the U.K.'s referendum to exit the European Union, which could adversely affect our results, financial condition and prospects;
- changes in domestic and international regulatory environments affecting our business;
- the evaluation of new services, new standards and system architectures by our customers;
- the cost and timely availability to us of components, subassemblies and modules;
- the mix of our customer base, by industry and size, and sales channels;
- changes in our operating and extraordinary expenses;
- the timing of acquisitions and dispositions by us and the financial impact of such transactions;
- impairment of our goodwill and intangibles;
- the impact of litigation, such as related litigation expenses and settlement costs;
- write-downs of inventory and investments;
- changes in our effective federal tax rate, including as a result of changes in our valuation allowance against our deferred tax assets, and changes in our effective state tax rates, including as a result of apportionment;
- changes to tax rules related to the deferral of foreign earnings and compliance with foreign tax rules;
- the impact of applicable accounting guidance on accounting for uncertainty in income taxes that requires us to establish reserves for uncertain tax positions and accrue potential tax penalties and interest; and
- the impact of applicable accounting guidance on business combinations that requires us to record charges for certain acquisition related costs and expenses and generally to expense restructuring costs associated with a business combination subsequent to the acquisition date.

The timing of deployment of our products by our customers can be subject to a number of other risks, including the availability of skilled engineering and technical personnel, the availability of third-party equipment and services, our customers' ability to negotiate and enter into rights agreements with video content owners that provide our customers with the right to deliver certain video content, and our customers' need for local franchise and licensing approvals.

We often recognize a substantial portion of our quarterly revenue in the last month of the quarter. We establish our expenditure levels for product development and other operating expenses based on projected revenue levels for a specified period, and expenses are relatively fixed in the short term. Accordingly, even small variations in the timing of revenue, particularly from relatively large individual transactions, can cause significant fluctuations in operating results in a particular quarter.

As a result of these factors and other factors, our operating results in one or more future periods may fail to meet or exceed the expectations of securities analysts or investors. In that event, the trading price of our common stock would likely decline.

Fluctuations in our future effective tax rates could affect our future operating results, financial condition and cash flows.

We are required to periodically review our deferred tax assets and determine whether, based on available evidence, a valuation allowance is necessary. The realization of our deferred tax assets, which are predominantly in the U.S., is dependent upon the generation of sufficient U.S. and foreign taxable income in the future to offset these assets. Based on our evaluation, a history of operating losses in recent years has led to uncertainty with respect to our ability to realize certain of our net deferred tax assets, and as a result we recorded a net increase in valuation allowance of $0.9 million and $9.0 million in 2018 and 2017, respectively, against our U.S. net deferred tax assets. The increases in valuation allowance in 2018 and 2017 were offset partially by the valuation allowance release of $1.5 million and $5.8 million, respectively. The releases of valuation allowance were associated with our foreign subsidiaries and a one-time benefit in 2017 of $2.6 million relating to the refund of alternative minimum tax credit carryforwards related to the TCJA.

Table of Content

The calculation of tax liabilities involves dealing with uncertainties in the application of complex global tax regulations. We recognize potential liabilities 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 taxes will be due. In the event we determine that it is appropriate to create a reserve or increase an existing reserve for any such potential liabilities, the amount of the additional reserve is charged as an expense in the period in which it is determined. If payment of these amounts ultimately proves to be unnecessary, the reversal of the liabilities would result in tax benefits being recognized in the period when we determine the liabilities are no longer necessary. If the estimate of tax liabilities proves to be less than the ultimate tax assessment for the applicable period, a further charge to expense in the period such short fall is determined would result. Either such charge to expense could have a material and adverse effect on our operating results for the applicable period.

Our future effective income tax rates could be adversely affected if tax authorities challenge our international tax structure or if the relative mix of U.S. and international income changes for any reason. Accordingly, there can be no assurance that our income tax rate will be less than the U.S. federal statutory rate in future periods.

The United States recently passed a comprehensive tax reform bill that could adversely affect our financial performance.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act of 2017, or the Tax Act. The Tax Act makes broad and complex changes to the U.S. tax code. The changes include, but are not limited to, reducing the U.S. federal corporate tax rate from 35% to 21%, imposing a mandatory one-time transition tax on certain unrepatriated earnings of foreign subsidiaries, eliminating the corporate alternative minimum tax, or AMT, and a requirement to pay a minimum tax on foreign earnings for tax years beginning after December 31, 2017. Notwithstanding the reduction in the corporate income tax rate, the overall impact of the new federal tax law is uncertain, and our financial performance could be adversely affected. In addition, it is uncertain if, and to what extent, various states will conform to the new tax law and foreign countries will react by adopting tax legislation or taking other actions that could adversely affect our business.

We or our customers may face intellectual property infringement claims from third parties.

Our industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. In particular, leading companies in the telecommunications industry have extensive patent portfolios. Also, patent infringement claims and litigation by entities that purchase or control patents, but do not produce goods or services covered by the claims of such patents (so-called "non-practicing entities" or "NPEs"), have increased rapidly over the last decade or so. From time to time, third parties, including NPEs, have asserted, and may assert in the future, patent, copyright, trademark and other intellectual property rights against us or our customers. Our suppliers and their customers, including us, may have similar claims asserted against them. A number of third parties, including companies with greater financial and other resources than us, have asserted patent rights to technologies that are important to us.

Any intellectual property litigation, regardless of its outcome, could result in substantial expense and significant diversion of the efforts of our management and technical personnel. An adverse determination in any such proceeding could subject us to significant liabilities and temporary or permanent injunctions and require us to seek licenses from third parties or pay royalties that may be substantial. Furthermore, necessary licenses may not be available on terms satisfactory to us, or at all. An unfavorable outcome on any such litigation matter could require that we pay substantial damages, could require that we pay ongoing royalty payments, or could prohibit us from selling certain of our products. Any such outcome could have a material and adverse effect on our business, operating results, financial condition and cash flows.

Our suppliers and customers may have intellectual property claims relating to our products asserted against them. We have agreed to indemnify some of our suppliers and most of our customers for patent infringement relating to our products. The scope of this indemnity varies, but, in some instances, includes indemnification for damages and expenses (including reasonable attorney's fees) incurred by the supplier or customer in connection with such claims. If a supplier or a customer seeks to enforce a claim for indemnification against us, we could incur significant costs defending such claim, the underlying claim or both. An adverse determination in either such proceeding could subject us to significant liabilities and have a material and adverse effect on our operating results, cash flows and financial condition.

We may be the subject of litigation which, if adversely determined, could harm our business and operating results.

We may be subject to claims arising in the normal course of business. The costs of defending any litigation, whether in cash expenses or in management time, could harm our business and materially and adversely affect our operating results and cash flows. An unfavorable outcome on any litigation matter could require that we pay substantial damages, or, in connection with any intellectual property infringement claims, could require that we pay ongoing royalty payments or prohibit us from

Table of Content

selling certain of our products. In addition, we may decide to settle any litigation, which could cause us to incur significant settlement costs. A settlement or an unfavorable outcome on any litigation matter could have a material and adverse effect on our business, operating results, financial condition and cash flows.

We may sell one or more of our product lines, from time to time, as a result of our evaluation of our products and markets, and any such divestiture could adversely affect our continuing business and our expenses, revenues, results of operation, cash flows and financial position.

We periodically evaluate our various product lines and may, as a result, consider the divestiture of one or more of those product lines. We have sold product lines in the past, and any prior or future divestiture could adversely affect our continuing business and expenses, revenues, results of operations, cash flows and financial position.

Divestitures of product lines have inherent risks, including the expense of selling the product line, the possibility that any anticipated sale will not occur, delays in closing any sale, the risk of lower-than-expected proceeds from the sale of the divested business, unexpected costs associated with the separation of the business to be sold from the seller's information technology and other operating systems, and potential post-closing claims for indemnification or breach of transition services obligations of the seller. Expected cost savings, which are offset by revenue losses from divested businesses, may also be difficult to achieve or maximize due to the seller's fixed cost structure, and a seller may experience varying success in reducing fixed costs or transferring liabilities previously associated with the divested business.

We could be negatively affected as a result of a future proxy contest and the actions of activist stockholders.

If a proxy contest with respect to election of our directors is initiated in the future, or if other activist stockholder activities occur, our business could be adversely affected because:

• responding to a proxy contest and other actions by activist stockholders can be costly and time-consuming, disrupting our operations and diverting the attention of management and our employees;

• perceived uncertainties as to our future direction caused by activist activities may result in the loss of potential business opportunities, and may make it more difficult to attract and retain qualified personnel and business partners; and

• if individuals are elected to our Board with a specific agenda, it may adversely affect our ability to effectively and timely implement our strategic plans.

Our failure to adequately protect our proprietary rights and data may adversely affect us.

At December 31, 2018, we held 81 issued U.S. patents and 53 issued foreign patents, and had 91 patent applications pending. Although we attempt to protect our intellectual property rights through patents, trademarks, copyrights, licensing arrangements, maintaining certain technology as trade secrets and other measures, we can give no assurances that any patent, trademark, copyright or other intellectual property rights owned by us will not be invalidated, circumvented or challenged, that such intellectual property rights will provide competitive advantages to us, or that any of our pending or future patent applications will be issued with the scope of the claims sought by us, if at all. We can give no assurances that others will not develop technologies that are similar or superior to our technologies, duplicate our technologies or design around the patents that we own. In addition, effective patent, copyright and trade secret protection may be unavailable or limited in certain foreign countries in which we do business or may do business in the future.

We may enter into confidentiality or license agreements with our employees, consultants, and vendors and our customers, as needed, and generally limit access to, and distribution of, our proprietary information. Nevertheless, we cannot provide assurances that the steps taken by us will prevent misappropriation of our technology. In addition, we have taken in the past, and may take in the future, legal action to enforce our patents and other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement or invalidity. Such litigation could result in substantial costs and diversion of management time and other resources, and could materially and adversely affect our business, operating results, financial condition and cash flows.

Table of Content

Our products include third-party technology and intellectual property, and our inability to acquire new technologies or use third-party technology in the future could harm our business.

In order to successfully develop and market certain of our planned products, we may be required to enter into technology development or licensing agreements with third parties. Although companies with technology useful to us are often willing to enter into technology development or licensing agreements with respect to such technology, we cannot provide assurances that such agreements may be negotiated on commercially reasonable terms, or at all. The failure to enter, or a delay in entering, into such technology development or licensing agreements, when necessary or desirable, could limit our ability to develop and market new products and could materially and adversely affect our business.

We incorporate certain third-party technologies, including software programs, into our products, and, as noted, intend to utilize additional third-party technologies in the future. In addition, the technologies that we license may not operate properly or as specified, and we may not be able to secure alternatives in a timely manner, either of which could harm our business. We could face delays in product releases until alternative technology can be identified, licensed or developed, and integrated into our products, if we are able to do so at all. These delays, or a failure to secure or develop adequate technology, could materially and adversely affect our business, operating results, financial condition and cash flows.

Our use of open source software in some of our products may expose us to certain risks.

Some of our products contain software modules licensed for use from third-party authors under open source licenses. Use and distribution of open source software may entail greater risks than use of third-party commercial software, as open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the code. Some open source licenses contain requirements that we make available source code for modifications or derivative works we create based upon the type of open source software we use. If we combine our proprietary software with open source software in a certain manner, we could, under certain of the open source licenses, be required to release the source code of our proprietary software to the public. This could allow our competitors to create similar products with lower development effort and in less time and ultimately could result in a loss of product sales for us.

Although we monitor our use of open source closely, it is possible our past, present or future use of open source has triggered or may trigger the foregoing requirements. Furthermore, the terms of many open source licenses have not been interpreted by U.S. courts, and there is a risk that such licenses could be construed in a manner that could impose unanticipated conditions or restrictions on our ability to commercialize our products. In such event, we could be required to seek licenses from third parties in order to continue offering our products, to re-engineer our products or to discontinue the sale of our products in the event re-engineering cannot be accomplished on a timely basis, any of which could materially and adversely affect our operating results, financial condition and cash flows.

We are subject to import and export control and trade and economic sanction laws and regulations that could subject us to liability or impair our ability to compete in international markets.

Our products are subject to U.S. export control laws, and may be exported outside the U.S. only with the required export license or through an export license exception, in most cases because we incorporate encryption technology into certain of our products. We are also subject to U.S. trade and economic sanction regulations which include prohibitions on the sale or supply of certain products and services to U.S. embargoed or sanctioned countries, governments, persons and entities. In addition, various countries regulate the import of certain technology and have enacted laws that could limit our ability to distribute our products, or could limit our customers’ ability to implement our products, in those countries. Although we take precautions and have processes in place to prevent our products and services from being provided in violation of such laws, our products may have been in the past, and could in the future be, provided inadvertently in violation of such laws, despite the precautions we take. If we fail to comply with these laws, we and certain of our employees could be subject to civil or criminal penalties, including the possible loss of export privileges, monetary penalties, and, in extreme cases, imprisonment of responsible employees for knowing and willful violations of these laws. Additionally, our business and operating results be adversely affected through penalties, reputational harm, loss of access to certain markets, or otherwise.

In addition, we may be subject to customs duties that could have a significant adverse impact on our operating results or, if we are able to pass on the related costs in any particular situation, would increase the cost of the related product to our customers. As a result, the future imposition of significant increases in the level of customs duties or the creation of import quotas on our products in Europe or in other jurisdictions, or any of the limitations on international sales described above, could have a material adverse effect on our business, operating results, financial condition and cash flows. Further, some of our customers in Europe have been, or are being, audited by local governmental authorities regarding the tariff classifications used for importation of our products. Import duties and tariffs vary by country and a different tariff classification for any of our

Table of Content

products may result in higher duties or tariffs, which could have an adverse impact on our operating results and potentially increase the cost of the related products to our customers.

We may need additional capital in the future and may not be able to secure adequate funds at all or on terms acceptable to us.

We engage in the design, development and manufacture and sale of a variety of video and cable access products and system solutions, which has required, and will continue to require, significant research and development expenditures.

We believe that our existing cash of approximately $66 million at December 31, 2018 will satisfy our cash requirements for at least the next 12 months. However, we may need to raise additional funds to take advantage of presently unanticipated strategic opportunities, satisfy our other cash requirements from time to time, or strengthen our financial position. Our ability to raise funds may be adversely affected by a number of factors, including factors beyond our control, such as weakness in the economic conditions in markets in which we sell our products and continued uncertainty in financial, capital and credit markets. There can be no assurance that equity or debt financing will be available to us on reasonable terms, if at all, when and if it is needed.

We may raise additional financing through public or private equity offerings, debt financings, or corporate partnership or licensing arrangements. To the extent we raise additional capital by issuing equity securities or convertible debt, our stockholders may experience dilution. To the extent that we raise additional funds through collaboration and licensing arrangements, it may be necessary to relinquish some rights to our technologies or products, or grant licenses on terms that are not favorable to us. To the extent we raise capital through debt financing arrangements, we may be required to pledge assets or enter into covenants that could restrict our operations or our ability to incur further indebtedness and the interest on such debt may adversely affect our operating results.

If adequate capital is not available, or is not available on reasonable terms, when needed, we may not be able to take advantage of acquisition or other market opportunities, to timely develop new products, or to otherwise respond to competitive pressures.

Cybersecurity incidents, including data security breaches or computer viruses, could harm our business by disrupting our business operations, compromising our products and services, damaging our reputation or exposing us to liability.

Cyber criminals and hackers may attempt to penetrate our network security, misappropriate our proprietary information or cause business interruptions. Because the techniques used by such computer programmers to access or sabotage networks change frequently and may not be recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures. In the past, we have faced compromises to our network security. While we have invested in and continue to update our network security and cybersecurity infrastructure and systems, if our cybersecurity systems fail to protect against unauthorized access, sophisticated cyber-attacks, phishing schemes, data protection breaches, computer viruses, denial-of-service attacks and similar disruptions from unauthorized tampering or human error, our ability to conduct our business effectively could be damaged in a number of ways, including:

• our intellectual property and other proprietary data, or financial assets, could be stolen;

• our ability to manage and conduct our business operations could be seriously disrupted;

• defects and security vulnerabilities could be introduced into our product, software and SaaS offerings, thereby damaging the reputation and perceived reliability and security of our products; and

• personally identifiable data of our customers, employees and business partners could be compromised.

Should any of the above events occur, our reputation, competitive position and business could be significantly harmed, and we could be subject to claims for liability from customers, third parties and governmental authorities. Additionally, we could incur significant costs in order to upgrade our cybersecurity systems and remediate damages. Consequently, our business, operating results, financial condition and cash flows could be materially and adversely affected. In addition, our business operations utilize and rely upon numerous third party vendors, manufacturers, solution providers, partners and consultants, and any failure of such third parties' cybersecurity measures could materially and adversely affect or disrupt our business.

Table of Content

Our operating results could be adversely affected by natural disasters affecting us or impacting our third-party manufacturers, suppliers, resellers or customers.

Our corporate headquarters is located in California, which is prone to earthquakes. We have employees, consultants and contractors located in regions and countries around the world. In the event that any of our business, sales or research and development centers or offices in the U.S. or internationally are adversely affected by an earthquake or by any other natural disaster, we may sustain damage to our operations and properties, which could cause a sustained interruption or loss of affected operations, and cause us to suffer significant financial losses.

We rely on third-party contract manufacturers for the production of our products. Any significant disruption in the business or operations of such manufacturers or of their or our suppliers could adversely impact our business. Our principal contract manufacturers and several of their and our suppliers and our resellers have operations in locations that are subject to natural disasters, such as severe weather, tsunamis, floods, fires and earthquakes, which could disrupt their operations and, in turn, our operations.

In addition, if there is a natural disaster in any of the locations in which our significant customers are located, we face the risk that our customers may incur losses or sustained business interruption, or both, which may materially impair their ability to continue their purchase of products from us. Accordingly, natural disaster in one of the geographies in which we, or our third-party manufacturers, their or our suppliers or our customers, operate could have a material and adverse effect on our business, operating results, cash flows and financial condition.

Our business and industry are subject to various laws and regulations that could adversely affect our business, operating results, cash flows and financial condition.

Our business and industry are regulated under various federal, state, local and international laws. For example, we are subject to environmental regulations such as the European Union’s Waste Electrical and Electronic Equipment (WEEE) and Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directives and similar legislation enacted in other jurisdictions worldwide. Our failure to comply with these laws could result in our being directly or indirectly liable for costs, fines or penalties and third-party claims, and could jeopardize our ability to conduct business in such regions and countries. We expect that our operations will be affected by other new environmental laws and regulations on an ongoing basis. Although we cannot predict the ultimate impact of any such new laws and regulations, they would likely result in additional costs, and could require that we redesign or change how we manufacture our products, any of which could have a material and adverse effect on our operating results, financial condition and cash flows.

We are subject to the Sarbanes-Oxley Act of 2002 which, among other things, requires an annual review and evaluation of our internal control over financial reporting. If we conclude in future periods that our internal control over financial reporting is not effective or if our independent registered public accounting firm is unable to provide an unqualified attestation as of future year-ends, we may incur substantial additional costs in an effort to correct such problems, and investors may lose confidence in our financial statements, and our stock price may decrease in the short term, until we correct such problems, and perhaps in the long term, as well.

We are subject to requirements under the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 that require us to conduct research, disclose, and report whether or not our products contain certain conflict minerals sourced from the Democratic Republic of Congo or its surrounding countries. The implementation of these requirements could adversely affect the sourcing, availability, and pricing of the materials used in the manufacture of components used in our products. In addition, we may incur certain additional costs to comply with the disclosure requirements, including costs related to conducting diligence procedures to determine the sources of conflict minerals that may be used or necessary to the production of our products and, if applicable, potential changes to products, processes or sources of supply as a consequence of such verification activities. It is also possible that we may face reputational harm if we determine that certain of our products contain minerals not determined to be conflict-free and/or we are unable to alter our products, processes or sources of supply to avoid such materials.

Changes in telecommunications legislation and regulations in the U.S. and other countries could affect our sales and the revenue we are able to derive from our products. In particular, on December 14, 2017, the U.S. Federal Communications Commission (FCC) voted to repeal the “net neutrality” rules and return to a “light-touch” regulatory framework. The FCC’s new rules, which took effect in June 2018, granted providers of broadband internet access services greater freedom to make changes to their services, including, potentially, changes that may discriminate against or otherwise harm our business. However, a number of parties have appealed these rules, which appeals are currently being reviewed by the D.C. Circuit Court of Appeals; thus the future impact of the FCC's repeal and any changes thereto remains uncertain. Additionally, on September

Table of Content

30, 2018, California enacted the California Internet Consumer Protection and Net Neutrality Act of 2018, making California the fourth state to enact a state-level net neutrality law since the FCC repealed its nationwide regulations, mandating that all broadband services in California must be provided in accordance with state net neutrality requirements. The U.S. Department of Justice has sued to block the law going into effect, and California has agreed to delay enforcement until the resolution of the FCC's repeal of the federal rules. A number of other states are considering legislation or executive actions that would regulate the conduct of broadband providers. We cannot predict whether the FCC order or state initiatives will be modified, overturned, or vacated by legal action of the court, federal legislation, or the FCC. The repeal of the net neutrality rules or other regulations dealing with access by competitors to the networks of incumbent operators could slow or stop infrastructure and services investments or expansion by service providers. Increased regulation of our customers' pricing or service offerings could limit their investments and, consequently, revenue from our products. The impact of new or revised legislation or regulations could have a material adverse effect on our business, operating results, financial condition and cash flows.

Some anti-takeover provisions contained in our certificate of incorporation and bylaws, as well as provisions of Delaware law, could impair a takeover attempt.

We have provisions in our certificate of incorporation and bylaws that could have the effect of rendering more difficult or discouraging an acquisition deemed undesirable by our Board. These include provisions:

• authorizing blank check preferred stock, which could be issued with voting, liquidation, dividend and other rights superior to our common stock;

• limiting the liability of, and providing indemnification to, our directors and officers;

• limiting the ability of our stockholders to call, and bring business before, special meetings;

• requiring advance notice of stockholder proposals for business to be conducted at meetings of our stockholders and for nominations of candidates for election to our Board;

• controlling the procedures for conducting and scheduling of Board and stockholder meetings; and

• providing the Board with the express power to postpone previously scheduled annual meetings and to cancel previously scheduled special meetings.

These provisions could delay hostile takeovers, changes in control of the Company or changes in our management. As a Delaware corporation, we are also subject to provisions of Delaware law, including Section 203 of the Delaware General Corporation law, which prevents some stockholders holding more than 15% of our outstanding common stock from engaging in certain business combinations without approval of the holders of substantially all of our outstanding common stock. Any provision of our certificate of incorporation or bylaws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

The nature of our business requires the application of complex revenue and expense recognition rules and the current legislative and regulatory environment affecting generally accepted accounting principles is uncertain. Significant changes in current principles could affect our financial statements going forward and changes in financial accounting standards or practices may cause adverse, unexpected financial reporting fluctuations and harm our operating results. The accounting rules and regulations that we must comply with are complex and subject to interpretation by the Financial Accounting Standards Board (the "FASB"), the SEC and various bodies formed to promulgate and interpret appropriate accounting principles. Recent actions and public comments from the FASB and the SEC have focused on the integrity of financial reporting and internal controls. In addition, many companies' accounting policies are being subject to heightened scrutiny by regulators and the public. Further, the accounting rules and regulations are continually changing in ways that could materially impact our financial statements. For example, in May 2014, the FASB issued Accounting Standards Update ("ASU") No. 2014-09, Revenue from Contracts with Customers ("Topic 606"), as amended, which superseded nearly all existing revenue recognition guidance. We adopted the new revenue standard in our first quarter of 2018 using a modified retrospective approach. In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842), to amend the existing accounting standard for lease accounting. The Company expects to adopt the new standard on January 1, 2019 and use the effective date as the date of initial application. (See Note 2, "Summary of Significant Accounting Policies" for additional information.)

Table of Content

We are implementing a new enterprise resource planning system, and if this new system proves ineffective or if we experience issues with the transition, we may be unable to timely or accurately prepare financial reports, make payments to our suppliers and employees, or invoice and collect from our users.

We are implementing a new enterprise resource planning, or ERP system. Our ERP system is critical to our ability to accurately maintain books and records and to prepare our financial statements. The transition to our new ERP system may be disruptive to our business if the ERP system does not work as planned or if we experience issues relating to the implementation. Such disruptions could impact our ability to timely or accurately make payments to our suppliers and employees, and could also inhibit our ability to invoice, and collect from our customers. Data integrity problems or other issues may be discovered which, if not corrected, could impact our business or financial results. In addition, we may experience periodic or prolonged disruption of our financial functions arising out of this conversion, general use of such system, other periodic upgrades or updates, or other external factors that are outside of our control. If we encounter unforeseen problems with our ERP system or other related systems and infrastructure, it could adversely affect our financial reporting systems and our ability to produce financial reports, the effectiveness of internal controls over financial reporting, and our business, operating results and financial condition could be adversely affected.

The conditional conversion feature of our convertible senior notes, if triggered, may adversely affect our financial condition and operating results.

In December 2015, we issued $128.3 million in aggregate principal amount of 4.0% convertible senior notes due 2020 (the “Notes”) through a private placement with a financial institution. The Notes bear interest at 4.0% per annum, which is payable semiannually in arrears on June 1 and December 1 of each year, commencing June 1, 2016. In the event the conditional conversion feature of the Notes is triggered, holders of the Notes will be entitled to convert the Notes at any time during specified periods at their option. If one or more holders elect to convert their Notes, unless we elect to satisfy our conversion obligation by delivering solely shares of our common stock (other than paying cash in lieu of delivering any fractional share), we would be required to settle a portion or all of our conversion obligation through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

The accounting method for convertible debt securities that may be settled in cash, such as the Notes, could have a material effect on our reported financial results.

Under Accounting Standards Codification 470-20, Debt with Conversion and Other Options, which we refer to as ASC 470-20, an entity must separately account for the liability and equity components of the convertible debt instruments (such as the Notes) that may be settled entirely or partially in cash upon conversion in a manner that reflects the issuer’s economic interest cost. The effect of ASC 470-20 on the accounting for the Notes is that the equity component is required to be included in the additional paid-in capital section of stockholders’ equity on our consolidated balance sheet, and the value of the equity component is being treated as a debt discount. As a result, we are required to record a greater amount of non-cash interest expense in current and future periods presented as a result of the amortization of the discounted carrying value of the Notes to their face amount over the term of the Notes. The increased net loss resulting from the amortization of the debt discount under ASC 470-20 could adversely affect our reported or future financial results, the trading price of our common stock and the trading price of the Notes.

In addition, under certain circumstances, convertible debt instruments (such as the Notes) that may be settled entirely or partly in cash are currently accounted for utilizing the treasury stock method, the effect of which is that the shares issuable upon conversion of the Notes are not included in the calculation of diluted earnings per share except to the extent that the conversion value of the Notes exceeds their principal amount. Under the treasury stock method, for diluted earnings per share purposes, the transaction is accounted for as if the number of shares of common stock that would be necessary to settle such excess, if we elected to settle such excess in shares, are issued. We cannot be sure that the accounting standards in the future will continue to permit the use of the treasury stock method or circumstances would change such that we would no longer be permitted to use the treasury stock method. If we are unable to use the treasury stock method in accounting for the shares issuable upon conversion of the Notes, our diluted earnings per share may be adversely affected.

Our common stock price, and therefore the price of our Notes, may be extremely volatile, and the value of an investment in our stock may decline.

Our common stock price has been highly volatile. We expect that this volatility will continue in the future due to factors such as:

Table of Content

• general market and economic conditions;

• actual or anticipated variations in operating results;

• increases or decreases in the general stock market or to the stock prices of technology companies;

• announcements of technological innovations, new products or new services by us or by our competitors or customers;

• changes in financial estimates or recommendations by stock market analysts regarding us or our competitors;

• announcements by us or our competitors of significant acquisitions, dispositions, strategic partnerships, joint ventures or capital commitments;

• announcements by our customers regarding end user market conditions and the status of existing and future infrastructure network deployments;

• additions or departures of key personnel; and

• future equity or debt offerings or our announcements of these offerings.

In addition, in recent years, the stock market in general, and The NASDAQ Stock Market and the securities of technology companies in particular, have experienced extreme price and volume fluctuations. These fluctuations have often been unrelated or disproportionate to the operating performance of individual companies. These broad market fluctuations have in the past, and may in the future, materially and adversely affect our stock price, regardless of our operating results. In these circumstances, investors may be unable to sell their shares of our common stock at or above their purchase price over the short term, or at all.

Our stock price may decline if additional shares are sold in the market or if analysts drop coverage of or downgrade our stock.

Future sales of substantial amounts of shares of our common stock by our existing stockholders in the public market, or the perception that these sales could occur, may cause the market price of our common stock to decline. In addition, we issue additional shares upon exercise of stock options, including under our 2002 Employee Stock Purchase Plan (“ESPP”), and in connection with grants of restricted stock units (“RSUs”) on an ongoing basis. To the extent we do not elect to pay solely cash upon conversion of our Notes, we will also be required to issue additional shares of common stock upon conversion. Increased sales of our common stock in the market after exercise of outstanding stock options or grants of restricted stock units could exert downward pressure on our stock price. These sales also might make it more difficult for us to sell equity or equity-related securities in the future at a time and price we deem appropriate.

The trading market for our common stock relies in part on the availability of research and reports that third-party industry or securities analysts publish about us. If one or more of the analysts who do cover us downgrade our stock, our stock price may decline. If one or more of these analysts cease coverage of us, we could lose visibility in the market, which in turn could cause the liquidity of our stock and our stock price to decline.

Item 1B. UNRESOLVED STAFF COMMENTS

None.

33

Table of Content

Item 2. PROPERTIES

All of our facilities are leased, including our principal operations and corporate headquarters in San Jose, California. We have research and development centers in the United States, France, Israel and Hong Kong. We have sales and service offices primarily in the U.S. and various locations in Europe and Asia. Our leases, which expire at various dates through June 2028, are for an aggregate of approximately 388,000 square feet of space, (this excludes 49,000 square feet of space that is vacant and available for sublease). Our San Jose lease, which expires in August 2020, is for approximately 143,000 square feet of such space. We have two business segments: Video and Cable Access. Because of the interrelation of these segments, a majority of these segments use substantially all of the properties, at least in part, and we retain the flexibility to use each of the properties in whole or in part for each of the segments. We believe that the facilities that we currently occupy are adequate for our current needs and that suitable additional space will be available, as needed, to accommodate the presently foreseeable expansion of our operations.

Item 3. LEGAL PROCEEDINGS

In October 2011, Avid Technology, Inc. (“Avid”) filed a complaint in the United States District Court for the District of Delaware alleging that our MediaGrid product infringes two patents held by Avid. A jury trial on this complaint commenced on January 23, 2014 and, on February 4, 2014, the jury returned a unanimous verdict in favor of us, rejecting Avid’s infringement allegations in their entirety. In January 2015, Avid filed an appeal with respect to the jury’s verdict with the Federal Circuit. In January 2016, the Federal Circuit issued an order vacating the verdict of noninfringement and remanding the case to the trial court for a new trial on infringement.

In June 2012, Avid served a subsequent complaint in the United States District Court for the District of Delaware alleging that our Spectrum product infringes one patent held by Avid. The complaint sought injunctive relief and unspecified damages. In September 2013, the U.S. Patent Trial and Appeal Board (“PTAB”) authorized an inter partes review to be instituted as to claims 1-16 of the patent asserted in this second complaint. In July 2014, the PTAB issued a decision finding claims 1-10 invalid and claims 11-16 not invalid. We filed an appeal with respect to the PTAB’s decision on claims 11-16 in September 2014, and the Federal Circuit affirmed the PTAB’s decision in April 2016.

In July 2017, the court issued a scheduling order consolidating both cases and setting the trial date for November 6, 2017.

On October 19, 2017, the parties agreed to settle the consolidated cases by entering into a settlement and patent portfolio cross-license agreement, and the cases were dismissed with prejudice. In connection with the agreement, we recorded a $6.0 million litigation settlement expense in “Selling, general and administrative expenses” in our 2017 Consolidated Statement of Operations. Of the associated $6.0 million settlement liability, $2.5 million was paid in October 2017 and the remaining $1.5 million and $2.0 million will be paid in the second quarter of 2019 and the third quarter of 2020, respectively.

From time to time, we are involved in lawsuits as well as subject to various legal proceedings, claims, threats of litigation, and investigations in the ordinary course of business, including claims of alleged infringement of third-party patents and other intellectual property rights, commercial, employment, and other matters. While certain matters to which we are a party may specify the damages claimed, such claims may not represent reasonably possible losses. Given the inherent uncertainties of litigation, the ultimate outcome of these matters cannot be predicted at this time, nor can the amount of possible loss or range of loss, if any, be reasonably estimated.

An unfavorable outcome on any litigation matters could require us to pay substantial damages, or, in connection with any intellectual property infringement claims, could require us to pay ongoing royalty payments or could prevent us from selling certain of our products. As a result, a settlement of, or an unfavorable outcome on, any of the matters referenced above or other litigation matters could have a material adverse effect on our business, operating results, financial position and cash flows.

Our industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. From time to time, third parties have asserted, and may in the future assert, exclusive patent, copyright, trademark and other intellectual property rights against us or our customers. Such assertions arise in the normal course of our operations. The resolution of any such assertions and claims cannot be predicted with certainty.

Table of Content

Item 4. MINE SAFETY DISCLOSURE

Not applicable.

Table of Content

PART II

Item 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information of our Common Stock

Our common stock is traded on The NASDAQ Global Select Market under the symbol HLIT, and has been listed on NASDAQ since our initial public offering in 1995. The following table sets forth, for the periods indicated, the high and low sales price per share of our common stock as reported on The NASDAQ Global Select Market:

	2018		2017	
	Sales Price		Sales Price	
Quarter ended	High	Low	High	Low
First quarter	$4.20	$2.95	$6.10	$4.90
Second quarter	4.45	3.40	6.00	4.90
Third quarter	5.55	4.15	5.35	2.80
Fourth quarter	6.16	4.57	4.55	2.85

Holders

As of February 22, 2019, there were approximately 347 holders of record of our common stock.

Dividend Policy

We have never declared or paid any dividends on our capital stock. At this time, we expect to retain future earnings, if any, for use in the operation and expansion of our business and do not anticipate paying any cash dividends in the foreseeable future.

Repurchases of Equity Securities by the Issuer

There were no stock repurchases during the year ended December 31, 2018. Our stock repurchase program expired on December 31, 2016. Further stock repurchases would require authorization from the Board.

Sales of Unregistered Securities

There were no sales of unregistered securities during the year ended December 31, 2018.

Table of Content

Stock Performance Graph

Set forth below is a line graph comparing the annual percentage change in the cumulative return to the stockholders of our common stock with the cumulative return of The NASDAQ Telecommunications Index and of the Standard & Poor's (S&P) 500 Index for the period commencing December 31, 2013 and ending on December 31, 2018. The graph assumes that $100 was invested in each of the Company's common stock, the S&P 500 and The NASDAQ Telecommunications Index on December 31, 2013, and assumes the reinvestment of dividends, if any. The comparisons shown in the graph below are based upon historical data. Harmonic cautions that the stock price performance shown in the graph below is not indicative of, nor intended to forecast, the potential future performance of the Company's common stock.

	12/13	12/14	12/15	12/16	12/17	12/18
Harmonic Inc.	100.00	94.99	55.15	67.75	56.91	63.96
S&P 500	100.00	113.69	115.26	129.05	157.22	150.33
NASDAQ Telecom	100.00	102.75	100.20	106.61	130.48	130.76

The information contained in this Stock Performance Graph section shall not be deemed to be "soliciting material", "filed" or incorporated by reference in previous or future filings with the SEC, or subject to the liabilities of Section 18 of the Exchange Act, except to the extent that Harmonic specifically incorporates it by reference into a document filed under the Securities Act or the Exchange Act.

Table of Content

Item 6. SELECTED FINANCIAL DATA

The selected financial data set forth below as of December 31, 2018 and 2017, and for the fiscal years ended December 31, 2018, 2017 and 2016, are derived from our Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K. The selected financial data as of December 31, 2016, 2015 and 2014, and for the fiscal years ended December 31, 2015 and 2014 are derived from audited financial statements not included in this Annual Report on Form 10-K. This financial data should be read in conjunction with Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations, and the Consolidated Financial Statements and related notes included elsewhere in this Annual Report on Form 10-K. These historical results are not necessarily indicative of the results to be expected in the future.

On February 29, 2016, we completed our acquisition of TVN and applied the acquisition method of accounting for the business combination. The selected consolidated balance sheet data as of December 31, 2016 represents the consolidated statement of financial position of the combined company. The selected consolidated statement of operations data for the year ended December 31, 2016 of the combined entity includes 10 months of operating results of TVN, beginning March 1, 2016.

	Year ended December 31,				
	2018	2017	2016	2015	2014
	(In thousands, except per share amounts)				
Consolidated Statements of Operations Data					
Net revenue	$403,558	$358,246	$405,911	$377,027	$433,557
Cost of revenue	194,349	188,426	205,161	174,315	221,209
Gross profit	209,209	169,820	200,750	202,712	212,348
Operating expenses:					
Research and development	89,163	95,978	98,401	87,545	93,061
Selling, general and administrative	118,952	136,270	144,381	120,960	131,322
Amortization of intangibles	3,187	3,142	10,402	5,783	6,775
Restructuring and related charges	2,918	5,307	14,602	1,372	2,761
Total operating expenses	214,220	240,697	267,786	215,660	233,919
Loss from operations	(5,011)	(70,877)	(67,036)	(12,948)	(21,571)
Interest income (expense), net	(11,401)	(11,078)	(10,628)	(333)	132
Other expense, net	(536)	(2,222)	(31)	(282)	(356)
Loss on impairment of long-term investments	—	(530)	(2,735)	(2,505)	—
Loss from continuing operations before income taxes	(16,948)	(84,707)	(80,430)	(16,068)	(21,795)
Provision for (benefit from) income taxes	4,087	(1,752)	(8,116)	(407)	24,453
Loss from continuing operations	$(21,035)	$(82,955)	$(72,314)	$(15,661)	$(46,248)
Net loss per share from continuing operations:					
Basic and diluted	$(0.25)	$(1.02)	$(0.93)	$(0.18)	$(0.50)
Shares used in per share calculations:					
Basic and diluted	85,615	80,974	77,705	87,514	92,508

	As of December 31,				
	2018	2017	2016	2015	2014
	(In thousands)				
Consolidated Balance Sheet Data					
Cash, cash equivalents and short-term investments	$65,989	$57,024	$62,558	$152,794	$104,879
Working capital	$60,297	$29,686	$71,938	$201,250	$142,754
Total assets	$510,835	$508,059	$554,069	$524,957	$480,518
Convertible notes, long-term	$114,808	$108,748	$103,259	$98,295	$—
Total stockholders' equity	$228,250	$218,343	$270,641	$328,168	$371,813

39

Table of Content

Item 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion should be read in conjunction with the consolidated financial statements and the related notes. The following discussion contains forward-looking statements that reflect our plans, estimates and beliefs. Our actual results could differ materially from those discussed in the forward-looking statements. Factors that could cause or contribute to these differences include, but are not limited to, those discussed below and those listed under Item 1A, Risks Factors.

Business Overview

We are a leading global provider of (i) versatile and high performance video delivery software, products, system solutions and services that enable our customers to efficiently create, prepare, store, playout and deliver a full range of high-quality broadcast and OTT video services to consumer devices, including televisions, personal computers, laptops, tablets and smart phones and (ii) cable access solutions that enable cable operators to more efficiently and effectively deploy high-speed internet, for data, voice and video services to consumers' homes.

We do business in three geographic regions: the Americas, EMEA and APAC and operate in two segments, Video and Cable Access. Our Video business sells video processing, production and playout solutions, and services worldwide to cable operators and satellite and telecommunications ("telco") Pay-TV service providers, which we refer to collectively as "service providers," as well as to broadcast and media companies, including streaming media companies. Our Video business infrastructure solutions are delivered either through shipment of our products, software licenses or as software-as-a-service ("SaaS") subscriptions. Our Cable Access business sells cable access solutions and related services, including our CableOS software-based cable access solution, primarily to cable operators globally.

Historically, our revenue has been dependent upon capital spending in the cable, satellite, telco, broadcast and media industries, including streaming media. Our customers' capital spending patterns are dependent on a variety of factors, including but not limited to: economic conditions in the U.S. and international markets; access to financing; annual budget cycles of each of the industries we serve; impact of industry consolidations; and customers suspending or reducing capital spending in anticipation of new products or new standards, new industry trends and/or technology shifts. If our product portfolio and product development plans do not position us well to capture an increased portion of the capital spending in the markets in which we compete, our revenue may decline. As we attempt to further diversify our customer base in these markets, we may need to continue to build alliances with other equipment manufacturers, content providers, resellers and system integrators, managed services providers and software developers; adapt our products for new applications; take orders at prices resulting in lower margins; and build internal expertise to handle the particular operational, payment, financing and/or contractual demands of our customers, which could result in higher operating costs for us.

A majority of our revenue has been derived from relatively few customers, due in part to the consolidation of our service provider customers. Sales to our 10 largest customers in 2018, 2017 and 2016 accounted for approximately 37%, 24% and 28% of our revenue, respectively. Although we are attempting to broaden our customer base by penetrating new markets and further expanding internationally, we expect to see continuing industry consolidation and customer concentration. During 2018, Comcast accounted for 15% of our net revenue. During 2017 and 2016, no single customer accounted for more than 10% of our net revenue. The loss of any significant customer, any material reduction in orders by any significant customer, or our failure to qualify our new products with any significant customer could materially and adversely affect our operating results, financial condition and cash flows.

Our net revenue increased $45.3 million, or 13% in 2018, compared to 2017, primarily due to an increase in our Cable Access segment revenue of $52.1 million, partially offset by decrease in our Video segment revenue of $5.6 million. The increase in our Cable Access segment revenue in 2018 was primarily due to an increase in sales of CableOS related hardware, software and support services. The decrease in our Video segment revenue in 2018 was primarily due to a shift in product mix to software-based products.

Our Video segment customers continue to be cautious with investments in new technologies, such as next-generation IP architecture and Ultra HD. We believe a material and growing portion of the opportunities for our video business are linked to a migration by our customers to IP workflows and the distribution of linear and on-demand, OTT, and new mobile video services. We continue to steadily transition our video business away from legacy and customized computing hardware to more software-centric solutions and services, including OTT SaaS subscription offerings that enable video compression and processing through our VOS software platform running on standard off-the-shelf servers, data centers and in the cloud.

Our Cable Access strategy is to continue to deliver software-based cable access technologies, which we refer to as our CableOS solutions, to our cable operator customers. We believe our CableOS software-based cable access solutions are superior to hardware-based systems and delivers unprecedented scalability, agility and cost savings for our customers. Our

Table of Content

CableOS solutions, which can be deployed based on a centralized, distributed Remote PHY or hybrid architecture, enable our customers to migrate to multi-gigabit broadband capacity and the fast deployment of DOCSIS 3.1 data, video and voice services. We believe our CableOS solutions resolve space and power constraints in the headend and hub, eliminate dependence on hardware upgrade cycles and significantly reduce total cost of ownership, and will help us become a major player in the cable access market. In the meantime, we believe our Cable Access segment is gaining momentum in the marketplace as our customers have begun to adopt new virtualized DOCSIS 3.1 CMTS solutions and distributed access architectures. While we are in the early stages of field trials and deployments and may experience near-term challenges, we continue to make progress in the development of our CableOS solutions and in the growth of our CableOS business, with expanded commercial deployments, field trials, and customer engagements since our first CableOS shipments in the fourth quarter of 2016.

To support our Cable Access strategy and foster the further development and growth of this segment, in September 2016, we issued Comcast a Warrant to further incentivize them to purchase our products and adopt our technologies, particularly our CableOS solutions. Pursuant to the Warrant, Comcast may, subject to certain vesting provisions, purchase up to 7,816,162 shares of our common stock, for a per share exercise price of $4.76. Because the Warrant is considered an incentive for Comcast to purchase certain of the Company’s products, the value of the Warrant is recorded as a reduction in the Company’s net revenues to the extent such value does not exceed net revenues from pertinent sales to Comcast. (See Note 16, “Warrants,” of the Notes to our Consolidated Financial Statements for additional information).

As the timing of our customers' investment decisions can be uncertain, we have implemented restructuring plans to better align the Company's resources and strategic goals. We continue to focus on expense controls on a company-wide basis. (See Note 10, “Restructuring and Related Charges” of the Notes to our Consolidated Financial Statements for additional information).

Our aggregate balance of cash and cash equivalents as of December 31, 2018 was $66.0 million, and we generated $12.3 million of cash from operations during the fiscal year ended December 31, 2018. We also entered into a $15 million line of credit with Silicon Valley Bank in September 2017 which has not been used to withdraw any cash till date. We expect that our current sources of liquidity will provide us adequate liquidity based on our current plan for the next twelve months.

Critical Accounting Policies, Judgments and Estimates

The preparation of financial statements and related disclosures requires Harmonic to make judgments, assumptions and estimates that affect the reported amounts of assets and liabilities, the disclosure of contingencies and the reported amounts of revenue and expenses in the financial statements and accompanying notes. Material differences may result in the amount and timing of revenue and expenses if different judgments or different estimates were made. See Note 2 of the Notes to our Consolidated Financial Statements for details of our accounting policies. Critical accounting policies, judgments and estimates that we believe have the most significant impact on Harmonic’s financial statements are set forth below:

- Revenue recognition;
- Valuation of inventories;
- Business combination;
- Impairment of goodwill or long-lived assets;
- Assessment of the probability of the outcome of current litigation;
- Accounting for income taxes; and
- Stock-based compensation.

Revenue Recognition

On January 1, 2018, the Company adopted ASC 606, Revenue from Contracts with Customers (“Topic 606”), using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. Results for the reporting period beginning January 1, 2018 are presented under Topic 606, while prior period amounts are not restated and continue to be reported in accordance with our historic accounting under ASC 605, Revenue Recognition (“Topic 605”). (See Note 2 “Summary of Significant Accounting Policies-Recently Adopted Accounting

Pronouncements” for additional information.)

Table of Content

Valuation of Inventories

We state inventories at the lower of cost or net realizable value. Cost is computed using standard cost, which approximates actual cost, on a first-in, first-out basis. We write down the cost of excess or obsolete inventory to net realizable value based on future demand forecasts and historical consumption. If there were to be a sudden and significant decrease in demand for our products, or if there were a higher incidence of inventory obsolescence because of rapidly changing technology and customer requirements, we could be required to record additional charges for excess and obsolete inventory and our gross margin could be adversely affected. Inventory management is of critical importance in order to balance the need to maintain strategic inventory levels to ensure competitive lead times against the risk of inventory obsolescence because of rapidly changing technology and customer requirements.

Business Combination

We applied the acquisition method of accounting for business combinations to our acquisition of TVN, which closed on February 29, 2016. (See Note 6, “Business Acquisition,” for additional information on TVN acquisition). Under this method of accounting, all assets acquired and liabilities assumed are recorded at their respective fair values at the date of the completion of the transaction. Determining the fair value of assets acquired and liabilities assumed requires management’s judgment and often involves the use of significant estimates and assumptions, including assumptions with respect to future cash inflows and outflows, discount rates, intangibles and other asset lives, among other items. Fair value is defined as the price that would be received in a sale of an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (an exit price). Market participants are assumed to be buyers and sellers in the principal (most advantageous) market for the asset or liability. Additionally, fair value measurements for an asset assume the highest and best use of that asset by market participants. As a result, we may have been required to value the acquired assets at fair value measurements that do not reflect its intended use of those assets. Use of different estimates and judgments could yield different results. Any excess of the purchase price over the fair value of the net assets acquired is recognized as goodwill.

Impairment of Goodwill or Long-lived Assets

Goodwill represents the difference between the purchase price and the estimated fair value of the identifiable assets acquired and liabilities assumed. We test for goodwill impairment at the reporting unit level, which is the same as our operating segment, on an annual basis in the fourth quarter of each of our fiscal years, and at any other time at which events occur or circumstances indicate that the carrying amount of goodwill may exceed its fair value.

In evaluating goodwill for impairment, we first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value (including goodwill). If we conclude that it is not more likely than not that the fair value of a reporting unit is less than its carrying value, then no further testing is required. However, if we conclude that it is more likely than not that the fair value of a reporting unit is less than its carrying value, then the two-step goodwill impairment test is performed to identify a potential goodwill impairment and measure the amount of impairment to be recognized, if any. The two-step impairment test involves estimating the fair value of all assets and liabilities of the reporting unit, including the implied fair value of goodwill, through either estimated discounted future cash flows or market-based methodologies.

During the fourth quarter of 2018, we performed goodwill impairment testing for our two reporting units as part of our annual goodwill impairment test and concluded that goodwill was not impaired. We have not recorded any impairment charges related to goodwill for any prior periods.

We evaluate the recoverability of intangible assets and other long-lived assets when indicators of impairment are present. When impairment indicators are present, we evaluate the recoverability of intangible assets and other long-lived assets on the basis of undiscounted cash flows expected to result from the use of each asset group and its eventual disposition. If the undiscounted expected future cash flows are less than the carrying amount of the asset, an impairment loss is recognized in order to write down the carrying value of the asset to its estimated fair market value.

Assessment of the Probability of the Outcome of Current Litigation

From time to time, we are involved in lawsuits as well as subject to various legal proceedings, claims, threats of litigation, and investigations in the ordinary course of business, including claims of alleged infringement of third-party patents and other intellectual property rights, commercial, employment and other matters. We assess potential liabilities in connection with each lawsuit and threatened lawsuits and accrue an estimated loss for these loss contingencies if both of the following conditions are met: information available prior to issuance of the financial statements indicates that it is probable that a liability has been incurred at the date of the financial statements and the amount of loss can be reasonably estimated. While certain matters to which we are a party specify the damages claimed, such claims may not represent reasonably probable losses. Given the inherent uncertainties of litigation, the ultimate outcome of these matters cannot be predicted at this time, nor can the amount of possible loss or range of loss, if any, be reasonably estimated.

An unfavorable outcome on any litigation matters could require us to pay substantial damages, or, in connection with any intellectual property infringement claims, could require us to pay ongoing royalty payments or could prevent us from selling certain of our products. As a result, a settlement of, or an unfavorable outcome on, any of the matters referenced above or other litigation matters could have a material adverse effect on our business, operating results, financial position and cash flows.

See Note 19, "Legal Proceedings," of the Notes to our Consolidated Financial Statements for additional information on the Avid litigation).

Accounting for Income Taxes

In preparing our financial statements, we estimate our income taxes for each of the jurisdictions in which we operate. This involves estimating our actual current tax expense and assessing temporary differences resulting from differing treatment of items, such as reserves and accruals, for tax and accounting purposes. These temporary differences result in deferred tax assets and liabilities, which are included within our Consolidated Balance Sheet.

We are subject to examination of our income tax returns by various tax authorities on a periodic basis. We regularly assess the likelihood of adverse outcomes resulting from such examinations to determine the adequacy of our provision for income taxes. We apply the provisions of the applicable accounting guidance regarding accounting for uncertainty in income taxes, which requires application of a more-likely-than-not threshold to the recognition and de-recognition of uncertain tax positions. If the recognition threshold is met, the applicable accounting guidance permits us to recognize a tax benefit measured at the largest amount of such tax benefit that, in our judgment, is more than fifty percent likely to be realized upon settlement. It further requires that a change in judgment related to the expected ultimate resolution of uncertain tax positions be recognized in earnings in the period in which such determination is made.

We file annual income tax returns in multiple taxing jurisdictions around the world. A number of years may elapse before an uncertain tax position is audited and finally resolved. While it is often difficult to predict the final outcome or the timing of resolution of any particular uncertain tax position, we believe that our reserves for income taxes reflect the most likely outcome. We adjust these reserves, as well as the related interest and penalties, in light of changing facts and circumstances. If our estimate of tax liabilities proves to be less than the ultimate assessment, a further charge to expense would result. If payment of these amounts ultimately proves to be unnecessary, the reversal of the liabilities would result in tax benefits being recognized in the period when we determine the liabilities are no longer necessary. Any changes in estimate, or settlement of any particular position, could have a material impact on our operating results, financial condition and cash flows.

Stock-based Compensation

We measure and recognize compensation expense for all stock-based compensation awards made to employees and non-employee directors, including stock options, restricted stock units and awards related to our Employee Stock Purchase Plan ("ESPP"), based upon the grant-date fair value of those awards. The grant date fair value of restricted stock units is based on the fair value of our common stock on the date of grant. The grant date fair value of our stock options and ESPP is estimated using the Black-Scholes option pricing model.

The determination of fair value of stock options and ESPP on the date of grant, using an option-pricing model, is affected by our stock price, as well as assumptions regarding a number of highly complex and subjective variables. These variables include our expected stock price volatility over the term of the awards, actual and projected employee stock option exercise behaviors, risk-free interest rates, and expected dividends. We estimated the expected life of the awards based on an analysis of our historical experience of employee exercise and post-vesting termination behavior considered in relation to the contractual life of the options and purchase rights. The risk-free interest rate assumption is based upon observed interest rates appropriate for the expected term of the awards. We do not currently pay cash dividends on our common stock and do not anticipate doing so in the foreseeable future. Accordingly, our expected dividend yield is zero.

Prior to January 1, 2017, stock-based compensation expense was recorded net of estimated forfeitures and, accordingly, was recorded for only those stock-based awards that we expected to vest. Upon the adoption of Accounting Standard Update No. 2016-09, Compensation - Stock Compensation (Topic 718) issued by the Financial Accounting Standards Board, our accounting policy was changed to account for forfeitures as they occur. The change was applied on a modified retrospective approach with a cumulative effect adjustment of $69,000 to retained earnings as of January 1, 2017 (which increased the accumulated deficit). The implementation of this accounting standard update has no impact to our statement of cash flows

Table of Content

because we do not have any excess tax benefits from share-based compensation as our tax provision is primarily under full valuation allowance. No prior periods were recast as a result of this change in accounting policy.
We recognize the stock-based compensation expense for performance-based RSUs ("PRSUs") based on the probability of achieving certain performance criteria, as defined in the PRSU agreements. We estimate the number of PRSUs ultimately expected to vest and recognize expense using the graded vesting attribution method over the requisite service period. Changes in our estimates related to probability of achieving certain performance criteria and number of PRSUs expected to vest could significantly affect the stock-based compensation expense from one period to the next.
If factors change and we employ different assumptions to determine the fair value of our stock-based compensation awards granted in future periods, the compensation expense may differ significantly from what we have recorded in the current period.
See Note 12, "Employee Benefit Plans and Stock-based Compensation," of the notes to our Consolidated Financial Statements for additional information.

Results of Operations
Net Revenue
The following table presents the breakdown of net revenue by geographical region (in thousands, except percentages):

	Year ended December 31,						
	2018	2017	2016	2018 vs. 2017		2017 vs. 2016	
Americas	$218,900	$171,736	$207,249	$47,164	27 %	$(35,513)	(17)%
EMEA	107,074	117,129	126,752	(10,055)	(9)%	(9,623)	(8)%
APAC	77,584	69,381	71,910	8,203	12 %	(2,529)	(4)%
Total net revenue	$403,558	$358,246	$405,911	$45,312	13 %	$(47,665)	(12)%
Regional revenue as a % of total net revenue:							
Americas	54 %	48 %	51 %				
EMEA	27 %	33 %	31 %				
APAC	19 %	19 %	18 %				

Fiscal 2018 compared to Fiscal 2017
Net revenue in the Americas increased $47.2 million, or 27% in 2018, compared to 2017, primarily due to an increase in revenue from sale of CableOS products and services.
EMEA net revenue decreased $10.1 million, or 9% in 2018, compared to 2017, primarily due to lower cable access volumes in the region and lower video product volumes as a result of soft demand for our traditional linear broadcast products, which was partially offset by increased volumes of OTT-related products as customers transition to OTT.
APAC net revenue increased $8.2 million, or 12% in 2018 compared to 2017, primarily due to improved demand from our service provider and broadcast and media customers for our video products and services.
Fiscal 2017 compared to Fiscal 2016
Net revenue in the Americas decreased $35.5 million, or 17%, in 2017 compared to 2016, primarily due to decreased demand for our video products as customers transition investment from traditional linear broadcast video products to our new OTT and SaaS solutions, which are being used to stream premium video content to mobile devices, computers and smart TVs, including large screen Ultra HD TVs.
EMEA net revenue decreased $9.6 million, or 8%, in 2017 compared to 2016, primarily due to the aforementioned shift from traditional broadcast Pay-TV products to OTT technologies and SaaS subscriptions, partially offset by an increase in Cable Access segment revenue as a result of increased customer demand for our new CableOS solution, compared to 2016.

Table of Content

APAC net revenue decreased $2.5 million, or 4% in 2017 compared to 2016, primarily due to timing of customer investments in video infrastructure as well as the negative impact from the technology shift in both segments.

Gross Profit

The following presents the gross profit and gross profit as a percentage of net revenue (“gross margin”) (in thousands, except percentages):

	Year ended December 31,						
	2018	2017	2016	2018 vs. 2017		2017 vs. 2016	
Gross profit	$209,209	$169,820	$200,750	$39,389	23%	$(30,930)	(15)%
As a percentage of net revenue (“gross margin”)	51.8 %	47.4 %	49.5 %	4.4 %		(2.1)%	

Our gross margins are dependent upon, among other factors, the proportion of software sales, product mix, customer mix, product introduction costs, price reductions granted to customers and achievement of cost reductions.

Gross margin increased 4.4% in 2018, as compared to 2017, primarily due to more favorable margins generated in our Cable Access segment due to increased CableOS activity. Our Video segment gross margin also improved marginally, primarily due to a favorable product mix.

Gross margin decreased 2.1% in 2017, as compared to 2016, primarily due to an unfavorable product mix, including transition from our traditional linear broadcast products to our new SaaS solutions, as well as lower service margins due to increased CableOS field trial activities and new production introduction costs, higher under-absorbed factory overhead costs, primarily driven by lower revenue and purchase levels year over year. In 2017, we recorded an inventory obsolescence charge of approximately $3.7 million for our legacy Cable Access product lines, compared to $4.0 million in 2016.

Research and Development

Our research and development expenses consist primarily of employee salaries and related expenses, contractors and outside consultants, supplies and materials, equipment depreciation and facilities costs, all associated with the design and development of new products and enhancements of existing products. The following table presents the research and development expenses and the expenses as a percentage of net revenue (in thousands, except percentages):

	Year ended December 31,						
	2018	2017	2016	2018 vs. 2017		2017 vs. 2016	
Research and development	$89,163	$95,978	$98,401	$(6,815)	(7)%	$(2,423)	(2)%
As a percentage of net revenue	22.1 %	26.8 %	24.2 %				

The $6.8 million, or 7%, decrease in research and development expenses in 2018 compared to 2017 was primarily due to lower employee compensation costs due to headcount reductions, lower utilization of third-party engineering services as the Company continues the process of transforming its research and development activities from capital intensive hardware development to predominantly software development and lower travel and other discretionary costs due to vigilant cost management throughout the Company. The decrease in research and development expenses was partially offset by $6.0 million in reimbursements of engineering spending by one of our large customers which ended in 2017 and higher incentive compensation associated with the Company’s performance. The research and development expense in 2018 was net of $5.9 million of French R&D tax credits.

The $2.4 million, or 2%, decrease in research and development expenses in 2017 compared to 2016 was primarily due to lower project material and outside consulting spending due to the completion of certain research and development projects in early 2017, lower employee compensation costs due to headcount reduction, and lower outside engineering services due to cost reduction efforts. The research and development expenses in each of 2017 and 2016 were net of $6.0 million in reimbursements of engineering spending in each of the year by one of our large customers, as well as $5.9 million and $6.1 million of French R&D tax credits, respectively.

Table of Content

Our TVN French Subsidiary participates in the French CIR program which allows companies to monetize eligible research expenses. We recognize R&D tax credits receivable from the French government for spending on innovative research and development as an offset to research and development expenses.

Selling, General and Administrative

The following table presents the selling, general and administrative expenses and the expense as a percentage of net revenue (in thousands, except percentages):

	Year ended December 31,				
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Selling, general and administrative	$118,952	$136,270	$144,381	$(17,318) (13)%	$(8,111) (6)%
As a percentage of net revenue	29.5 %	38.0 %	35.6 %		

The $17.3 million, or 13%, decrease in selling, general and administrative expenses in 2018 compared to 2017 was primarily due to lower employee compensation costs due to headcount reductions, higher legal and settlement charges recorded during 2017 related to Avid litigation, and lower travel and other discretionary costs due to vigilant cost management throughout the Company. This decrease was partially offset by higher incentive compensation associated with the Company's performance.

The $8.1 million, or 6%, decrease in selling, general and administrative expenses in 2017 compared to 2016 was primarily due to lower TVN acquisition- and integration- related costs in 2017 as majority of the integration projects were completed in early 2017. In addition, lower headcount expenses and lower depreciation expenses from reduction in capital expenditure also contributed to the decrease year over year. These reductions were offset in part by a $6.0 million charge related to the Avid litigation settlement in 2017.

Segment Financial Results

The following table provides summary financial information by reportable segment (in thousands, except percentages):

	Year ended December 31,						
	2018 [2]	2017 [1]	2016	2018 vs. 2017		2017 vs. 2016	
Video							
Revenue	$313,828	$319,473	$351,489	$(5,645)	(2)%	$(32,016)	(9)%
Gross profit	178,170	173,414	194,044	4,756	3 %	(20,630)	(11)%
Operating income (loss)	26,170	(2,024)	11,963	28,194	(1,393)%	(13,987)	(117)%
Segment revenue as % of total segment revenue	77.5 %	89.2 %	86.6 %	(11.7)%		2.6 %	
Gross margin %	56.8 %	54.3 %	55.2 %	2.5 %		(0.9)%	
Operating margin %	8.3 %	(0.6)%	3.4 %	8.9 %		(4.0)%	
Cable Access							
Revenue	$90,908	$38,773	$54,422	$52,135	134 %	$(15,649)	(29)%
Gross profit	40,207	8,892	21,174	31,315	352 %	(12,282)	(58)%
Operating loss	(578)	(23,154)	(12,131)	22,576	(98)%	(11,023)	91 %
Segment revenue as % of total segment revenue	22.5 %	10.8 %	13.4 %	11.7 %		(2.6)%	
Gross margin %	44.2 %	22.9 %	38.9 %	21.3 %		(16.0)%	
Operating margin %	(0.6)%	(59.7)%	(22.3)%	59.1 %		(37.4)%	
Total							
Segment Revenue	$404,736	$358,246	$405,911	$46,490	13 %	$(47,665)	(12)%
Gross profit	218,377	182,306	215,218	36,071	20 %	(32,912)	(15)%
Operating income (loss)	25,592	(25,178)	(168)	50,770	(202)%	(25,010)	14,887 %

Table of Content

A reconciliation of our consolidated segment operating income (loss) to consolidated loss before income taxes is as follows (in thousands):

	Year ended December 31,		
	2018 [2]	2017 [1]	2016
Total segment operating income (loss)	$25,592	$(25,178)	$(168)
Amortization of warrants [2]	(1,178)	—	—
Unallocated corporate expenses	(3,769)	(20,767)	(38,972)
Stock-based compensation	(17,289)	(16,610)	(13,060)
Amortization of intangibles	(8,367)	(8,322)	(14,836)
Consolidated loss from operations	(5,011)	(70,877)	(67,036)
Non-operating expense, net	(11,937)	(13,830)	(13,394)
Loss before income taxes	$(16,948)	$(84,707)	$(80,430)

(1) We have historically employed an aggregate allocation methodology based on total revenues to attribute professional services revenue and sales expenses between our Video and Cable Access segments. Beginning in the fourth quarter of 2017, we have prospectively changed to a more precise attribution methodology as the activities of selling and supporting our CableOS solution have become increasingly distinct from those of our Video solutions. The impact of making this change for the year ended December 31, 2017 compared to our historical approach was an increase in operating loss of $5.9 million from the Video segment and a corresponding decrease in operating loss of the Cable Access segment. We believe that the updated allocation methodology provides greater clarity regarding the operating metrics of the Video and Cable Access business segments.
(2) Our segment revenue for 2018 is not net of amortization of Comcast warrants, which primarily relate to our Cable Access segment. After netting the amortization of warrants from the segment revenue for Cable Access, our revenue for Cable Access segment for the year ended December 31, 2018 was $89,730 thousand and our total revenue for the year ended December 31, 2018 was $403,558 thousand.

Unallocated Corporate Expenses

Together with amortization of intangibles and stock-based compensation, we do not allocate restructuring and related charges, TVN acquisition- and integration-related costs, and certain other non-recurring charges to the operating income for each segment because our management does not include this information in the measurement of the performance of the operating segments.

Video

Our Video segment net revenue decreased $5.6 million, or 2% in 2018, compared to 2017, due to a decrease of $4.4 million in Video service revenue and a decrease of $1.2 million in Video product revenue. The decrease in our Video service revenue in 2018 was primarily due to reduced activity in connection with SaaS deployments. The decrease in our Video product revenue was primarily due to decreased demand for our traditional linear broadcast products as customers transition to our new OTT and SaaS solutions. Video segment operating margin increased 8.9% in 2018, compared to 2017, primarily due to better margins as a result of a more favorable product mix, lower operating expenses due to headcount reductions and lower other discretionary costs due to vigilant cost management throughout the Company. The increase in Video segment margin was partially offset by a decrease due to the change in methodology for allocating professional services revenue between segments in the fourth quarter of 2017.

Our Video segment net revenue decreased $32.0 million, or 9%, in 2017 compared to 2016, due to a $39.9 million decrease in video product revenue, offset in part by a $7.9 million increase in video service revenue. The decrease in our Video segment net revenue in 2017 reflects our customers' transition from our traditional linear broadcast products to our new OTT technologies and SaaS solutions, partially offset by higher revenue due to the inclusion of two additional months of TVN post-acquisition revenue, compared to 2016. Video segment operating margin decreased 4.0% in 2017, compared to 2016, primarily due to decrease in video product revenue which led to higher unabsorbed factory overhead and higher inventory obsolescence charges for our legacy broadcast video inventory, offset partially by a decrease in discretionary operating expenses.

Table of Content

Cable Access

Our Cable Access segment net revenue increased $52.1 million, or 134% in 2018, compared to 2017, primarily due to increase in shipments of hardware, software and services for our CableOS solution. Cable Access segment operating margin increased 59.1% in 2018, compared to 2017, due to higher revenue and related higher margins on sale of both software and professional services. The change in methodology for allocating professional services revenue between segments in the fourth quarter of 2017 also contributed to the increase in Cable Access margins in 2018 as compared to 2017.

Our Cable Access segment net revenue decreased $15.6 million, or 29%, in 2017 compared to 2016, primarily due to continuing lower demand for our legacy EdgeQAM technologies as some of our customers deferred purchases as they plan for a migration to next generation technologies and architectures. Cable Access segment operating margin decreased 37.4% in 2017, compared to 2016, due to the reduced demand for our legacy EdgeQAM products as well as higher service costs related to increased CableOS trial activity and new product introduction costs, as well as higher research and development expenses for CableOS development in 2017.

Amortization of Intangibles

The following table summarizes the amortization of intangibles (in thousands, except percentages):

	Year ended December 31,						
	2018	2017	2016	2018 vs. 2017		2017 vs. 2016	
Amortization of intangibles	$3,187	$3,142	$10,402	$45	1%	$(7,260)	(70)%
As a percentage of net revenue	0.8 %	0.9 %	2.6 %				

The amortization of intangibles expense in 2018 remained relatively flat compared to 2017.

The decrease in amortization of intangibles expense in 2017, compared to 2016, was primarily due to intangibles for customer relationships and maintenance agreements relating to Omneon acquisition being fully amortized in 2016.

Restructuring and Related Charges

We have implemented several restructuring plans in the past few years. The goal of these plans is to bring operational expenses to appropriate levels relative to our net revenues, while simultaneously implementing extensive company-wide expense control programs. We account for our restructuring plans under the authoritative guidance for exit or disposal activities. The restructuring and related charges are included in “Cost of revenue” and “Operating expenses-restructuring and related charges” in the Consolidated Statements of Operations. The following table summarizes the restructuring and related charges (in thousands):

	Year ended December 31,						
	2018	2017	2016	2018 vs. 2017		2017 vs. 2016	
Cost of revenue	$857	$1,279	$3,400	$(422)	(33)%	$(2,121)	(62)%
Operating expenses-Restructuring and related charges	2,918	5,307	14,602	(2,389)	(45)%	(9,295)	(64)%
Total restructuring and related charges	$3,775	$6,586	$18,002	$(2,811)	(43)%	$(11,416)	(63)%

The $2.8 million decrease in restructuring and related charges in 2018, compared to 2017, was primarily due to higher TVN VDP and severance costs recorded in 2017 related to the Harmonic 2016 and 2017 Restructuring Plans, partially offset by facility exit costs and severance costs recorded under the Harmonic 2018 Restructuring Plan.

The $11.4 million decrease in restructuring and related charges in 2017, compared to 2016, was primarily due to lower TVN VDP costs in 2017, compared to 2016. Most of the TVN VDP costs were recorded in 2016 based on the departing employees’ service period.

See Note 10, “Restructuring and Related Charges,” of the Notes to our Consolidated Financial Statements for details on each of our restructuring plans.

Table of Content

Interest Expense, Net

Interest expense, net was $11.4 million, $11.1 million and $10.6 million during 2018, 2017 and 2016, respectively. The year-over-year increase in interest expense, net is primarily due to higher amortization of debt discount and issuance costs for the Notes issued in December 2015. See Note 11, “Convertible Notes, Other Debts and Capital Leases,” of the Notes to our Consolidated Financial Statements for additional information.

Other Expense, Net

Other expense, net was $0.5 million, $2.2 million and $31,000 during 2018, 2017 and 2016, respectively. Other expense, net is primarily comprised of foreign exchange gains and losses on cash, accounts receivable and intercompany balances denominated in currencies other than the functional currency of the reporting entity. Our foreign currency exposure is primarily driven by the fluctuations in the foreign currency exchanges rates of the Euro, British pound, Japanese yen and Israeli shekel. The decrease in other expense, net in 2018 compared to 2017 was primarily due to higher foreign exchange losses resulting from the strengthening of the Euro against the U.S. dollars in 2017. See “Foreign Currency Exchange Risk” under Item 7A of this Annual Report on Form 10-K for additional information.

Loss on Impairment of Long-term Investments

In 2014, we acquired a 3.3% interest in Vislink plc (“Vislink”), a U.K. public company listed on the AIM exchange, for $3.3 million. On February 3, 2017, Vislink completed the disposal of its hardware division and changed its name to Pebble Beach Systems (“PBS”).

Since mid-2016, the stock price of PBS, has traded below its cost basis as a result of which we recorded a total of $2.7 million and $0.5 in impairment charges in 2016 and 2017, respectively. We sold this investment for $0.1 million in the third quarter of 2018.

Income Taxes

We reported the following operating results for each of the three years ended December 31, 2018, 2017 and 2016 (in thousands, except percentages):

	Year ended December 31,		
	2018	2017	2016
Loss before income taxes	(16,948)	(84,707)	(80,430)
Provision for (benefit from) income taxes	4,087	(1,752)	(8,116)
Effective income tax rate	(24)%	2%	10%

Our effective tax rate generally differs from the U.S. federal statutory rate of 21% due to favorable tax rates associated with certain earnings from our operations in lower tax jurisdictions throughout the world and our valuation allowance in the U.S. In addition, our effective tax rates vary in each period primarily due to specific one-time, discrete items that affected the tax rate in the respective period.

In 2018, our effective income tax rate of (24)% differed from the U.S. federal statutory rate of 21% primarily due to geographical mix of income and losses, full valuation allowance against U.S. federal, California and other states deferred tax assets, foreign withholding taxes and income taxes on earnings from operations in foreign tax jurisdictions.

On December 22, 2017, the Tax Cuts and Jobs Act (the “TCJA”) was enacted which, among other things, lowered the U.S. federal corporate income tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign sourced earnings. As of December 31, 2018, we completed the accounting for transition tax and concluded that it had no tax impact because our cumulative unremitted earnings and profits are negative.

The TCJA also includes a requirement to pay a minimum tax on foreign earnings for tax years beginning after December 31, 2017. An accounting policy choice is allowed to either treat taxes due on future U.S. inclusions as a current period expense or account for the minimum tax in the measurement of deferred tax assets. We elected to treat the minimum tax as a period cost. As such, we did not recognize any deferred taxes related to the minimum tax.

Table of Content

In 2017, our effective income tax rate of 2% differed from the U.S. federal statutory rate of 35% primarily due to our geographical income mix, favorable tax rates associated with certain earnings from operations in lower-tax jurisdictions, tax rate changes in foreign jurisdictions, tax benefits associated with the release of tax reserves for uncertain tax positions resulting from the expiration of the applicable statute of limitations, a one-time benefit from the reduction of a valuation allowance on alternative minimum tax ("AMT") credit carryforwards that will be refundable as a result of the TCJA, partially offset by the increase in the valuation allowance against U.S. federal, California and other state deferred tax assets, detriment from non-deductible stock-based compensation, and the net of various other discrete tax adjustments.

In 2016, our effective income tax rate of 10% differed from the then-applicable U.S. federal statutory rate of 35% primarily due to our geographical income mix and our tax valuation allowance, favorable tax rates associated with certain earnings from operations in lower-tax jurisdictions, favorable resolutions of uncertain tax positions, and the tax benefit from the realization of certain deferred tax assets as a result of the TVN acquisition, partially offset by the increase in the valuation allowance against U.S. federal, California and other state deferred tax assets, detriment from non-deductible stock-based compensation, non-deductible amortization of foreign intangibles, and the net of various discrete tax adjustments.

For a reconciliation of our effective tax rate to the U.S. federal statutory rate of 21% and further explanation of our provision for taxes, see Note 14, "Income Taxes," of the notes to our Consolidated Financial Statements.

Liquidity and Capital Resources

As of December 31, 2018, our principal sources of liquidity consisted of cash and cash equivalents of $66.0 million, net accounts receivable of $81.8 million, our $15 million line of credit with Silicon Valley Bank, described in more detail below, and financing from French government agencies. As of December 31, 2018, we had $128.25 million in convertible senior notes outstanding ("Notes"), which are due on December 1, 2020. The Notes bear interest at a fixed rate of 4.00% per year, payable semiannually in arrears on June 1 and December 1 of each year. We also had debts with French government agencies and to a lesser extent, with other financial institutions, primarily in France, in the aggregate of $19.9 million at December 31, 2018.

Our cash and cash equivalents of $66.0 million as of December 31, 2018 consisted of bank deposits held throughout the world, of which $48.1 million of the cash and cash equivalents balance was held outside of U.S. At present, such foreign funds are considered to be indefinitely reinvested in foreign countries to the extent of indefinitely reinvested foreign earnings. In the event funds from foreign operations are needed to fund cash needs in the United States and if U.S. taxes have not already been previously accrued, we may be required to accrue and pay additional U.S. and foreign withholding taxes in order to repatriate these funds.

Our principal uses of cash will include repayments of debt and related interest, purchases of inventory, payroll, restructuring expenses, and other operating expenses related to the development and marketing of our products, purchases of property and equipment and other contractual obligations for the foreseeable future. We believe that our cash and cash equivalents of $66.0 million at December 31, 2018 will be sufficient to fund our principal uses of cash for at least the next 12 months. However, we may need to raise additional funds to fund our operations, to take advantage of unanticipated strategic opportunities or to strengthen our financial position. In the future, we may enter into other arrangements for potential investments in, or acquisitions of, complementary businesses, services or technologies, which could require us to seek additional equity or debt financing. Additional funds may not be available on terms favorable to us or at all.

On September 27, 2017, we entered into a Loan and Security Agreement (the "Loan Agreement") with Silicon Valley Bank (the "Bank"). The Loan Agreement provides for a secured revolving credit facility in an aggregate principal amount of up to $15.0 million. Under the terms of the Loan Agreement, the principal amount of loans, plus the face amount of any outstanding letters of credit, at any time cannot exceed up to 85% of our eligible receivables. Under the terms of the Loan Agreement, we may also request letters of credit from the Bank. Loans under the Loan Agreement will bear interest at our option, and subject to certain conditions, at an annual rate of either a prime rate or a LIBOR rate plus an applicable margin of 2.25%. There will be no applicable margin for prime rate advances when we are in compliance with the liquidity requirement of at least $20.0 million in the aggregate of consolidated cash plus availability under the Loan Agreement (the “Liquidity Requirement”) and a 0.25% margin for prime rate advances when we are not in compliance with the Liquidity Requirement. We may not request LIBOR advances when not in compliance with the Liquidity Requirement. Interest on each advance is due and payable monthly and the principal balance is due at maturity. Our obligations under the revolving credit facility are secured by a security interest on substantially all of its assets, excluding intellectual property. The Loan Agreement contains customary affirmative and negative covenants. We must comply with financial covenants requiring maintaining (i) a minimum short-term asset to short-term liabilities ratio and (ii) minimum adjusted EBITDA, in the amounts and for the periods as set forth in the Loan Agreement. We must also maintain a minimum liquidity amount, comprised of unrestricted cash held at accounts with the Bank plus proceeds available to be drawn under the Loan Agreement, equal to $10.0 million at all times.

Table of Content

There were no borrowings under the Loan Agreement from the closing of the Loan Agreement through December 31, 2018. As of December 31, 2018, we were in compliance with the covenants under the Loan Agreement.

The table below presents selected cash flow data for the periods presented (in thousands):

	Year ended December 31,		
	2018	2017	2016
	(In thousands)		
Net cash provided by operating activities	$12,284	$3,064	$438
Net cash used in investing activities	(6,940)	(4,501)	(69,734)
Net cash provided by (used in) financing activities	2,651	895	(152)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(763)	1,879	(415)
Net increase (decrease) in cash, cash equivalents and restricted cash	$7,232	$1,337	$(69,863)

Operating Activities

Net cash provided by operating activities increased $9.2 million in 2018 compared to 2017, primarily due to decrease in net loss, offset in part by higher cash being used for our working capital needs.

Net cash provided by operating activities increased $2.6 million in 2017 compared to 2016, primarily due to more cash being generated from net working capital, offset in part by a $1.2 million increase in net loss.

We expect that cash provided by or used in operating activities may fluctuate in future periods as a result of a number of factors, including fluctuations in our operating results, shipment linearity, accounts receivable collections performance, inventory and supply chain management, and the timing and amount of compensation and other payments.

Investing Activities

Net cash used in investing activities increased $2.4 million in 2018 compared to 2017, primarily due to a decrease in proceeds from sales and maturities of investments of $6.8 million, offset by a decrease in purchases of property and equipment of $4.4 million.

Net cash used in investing activities decreased $65.2 million in 2017 compared to 2016, primarily due to the $75.7 million net cash paid for the TVN acquisition in 2016 and less cash used for purchases of property and equipment, offset in part by lesser proceeds from sale and maturities of marketable investments.

Financing Activities

Net cash provided by financing activities increased $1.8 million in 2018 compared to 2017, primarily due to lower payment of tax withholding obligations related to net share settlements of restricted stock units.

Net cash provided by financing activities increased $1.0 million in 2017 compared to 2016, primarily due to lower net debt payments in 2017, offset in part by higher payments of tax withholding obligations related to net share settlements of RSUs in 2017.

Off-Balance Sheet Arrangements

None as of December 31, 2018.

Contractual Obligations and Commitments

Future payments under contractual obligations and other commercial commitments, as of December 31, 2018 are as follows (in thousands):

Table of Content

	Payments due in each fiscal year				
	Total Amounts Committed	Less than 1 year	1 to 3 years	4 to 5 years	More than 5 years
Convertible debt	$128,250	$—	$128,250	$—	$—
Operating leases [1]	39,179	13,515	14,227	4,743	6,694
Purchase commitments [2]	35,946	30,005	5,220	721	—
Other debts	19,697	7,084	11,940	607	66
Interest on convertible debt	10,260	5,130	5,130	—	—
Avid litigation settlement fees	3,500	1,500	2,000	—	—
TVN VDP obligations [3]	2,409	1,585	824	—	—
Capital Lease	162	91	71	—	—
Total contractual obligations	$239,403	$58,910	$167,662	$6,071	$6,760
Other commercial commitments:					
Standby letters of credit	$2,179	$2,179	$—	$—	$—
Indemnification obligations [4]	—	—	—	—	—
Total commercial commitments	$2,179	$2,179	$—	$—	$—

(1) We lease facilities under operating leases expiring through June 2028. Certain of these leases provide for renewal option for periods ranging from one to five years in the normal course of business.

(2) During the normal course of business, in order to reduce manufacturing lead times and ensure adequate component supply, we enter into agreements with certain contract manufacturers and suppliers that allow them to procure inventory and services based upon criteria as defined by the Company.

(3) In 2016, we established the TVN VDP to enable the French employees of TVN to voluntarily terminate their employment with certain benefits. See Note 10, “Restructuring and Related Charges-TVN VDP,” of the notes to our Consolidated Financial Statements for additional information.

(4) We indemnify our officers and the members of our Board pursuant to our bylaws and contractual indemnity agreements. We also indemnify some of our suppliers and most of our customers for specified intellectual property matters and some of our other vendors, such as building contractors, pursuant to certain parameters and restrictions. The scope of these indemnities varies, but, in some instances, includes indemnification for defense costs, damages and other expenses (including reasonable attorneys’ fees).

Due to the uncertainty with respect to the timing of future cash flows associated with our unrecognized tax benefits at December 31, 2018, we are unable to make reasonably reliable estimates of the period of cash settlement with the respective taxing authority. Therefore, $0.5 million of unrecognized tax benefits classified as “Income taxes payable, long-term” in the accompanying Consolidated Balance Sheet as of December 31, 2018, had been excluded from the contractual obligations table above. See Note 14, “Income Taxes,” of the notes to our Consolidated Financial Statements for a discussion on income taxes.

New Accounting Pronouncements

See Note 2 of the accompanying Consolidated Financial Statements for a full description of recent accounting pronouncements, including the respective expected dates of adoption and effects on results of operations and financial condition.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Foreign Currency Exchange Risk

We market and sell our products and services through our direct sales force and indirect channel partners in North America, EMEA, APAC and Latin America. Accordingly, we are subject to exposure from adverse movements in foreign currency exchange rates, primarily the Euro, British pound, Israeli shekel and Japanese yen. Our U.S. dollar functional

52

Table of Content

subsidiaries, which account for approximately 95%, 95% and 88% of our consolidated net revenues in 2018, 2017 and 2016, respectively, recorded net billings denominated in foreign currencies of approximately 14%, 18% and 13% of their net revenues in 2018, 2017 and 2016, respectively. In addition, a portion of our operating expenses, primarily the cost of personnel to deliver technical support on our products and professional services, sales and sales support and research and development, are denominated in foreign currencies, primarily the Euro, Israeli shekel and British pound. We use derivative instruments, primarily forward contracts, to manage exposures to foreign currency exchange rates and we do not enter into foreign currency forward contracts for trading purposes.

Derivatives Not Designated as Hedging Instruments (Balance Sheet Hedges)

We enter into forward currency contracts to hedge foreign currency denominated monetary assets and liabilities. These derivative instruments are marked to market through earnings every period and mature generally within three months. Changes in the fair value of these foreign currency forward contracts are recognized in "Other expense, net" in the Consolidated Statement of Operations, and are largely offset by the changes in the fair value of the assets or liabilities being hedged.

The U.S. dollar equivalents of all outstanding notional amounts of foreign currency forward contracts are summarized as follows (in thousands):

	December 31,	
	2018	2017
Derivatives not designated as hedging instruments:		
Purchase	$28,975	$12,875
Sell	$—	$1,509

Interest Rate Risk

Our exposure to market risk for changes in interest rates relates primarily to our outstanding debt arrangements with variable rate interests as well as our borrowings under the Loan Agreement.

On September 27, 2017, we entered into the Loan Agreement with Silicon Valley Bank. The Loan Agreement provides for a secured revolving credit facility in an aggregate principal amount of up to $15.0 million. Loans under the Loan Agreement will bear interest, at our option, and subject to certain conditions, at an annual rate of either a prime rate or a LIBOR rate (each as customarily defined), plus an applicable margin. The applicable margin for LIBOR rate advances is 2.25%. There will be no applicable margin for prime rate advances when we are in compliance with the Liquidity Requirement and a margin of 0.25% for prime rate advances when we are not in compliance with the Liquidity Requirement. We may not request LIBOR advances when it is not in compliance with the Liquidity Requirement. Interest on each advance is due and payable monthly and the principal balance is due at maturity.

As of December 31, 2018, the Company committed $1.8 million towards security for letters of credit issued under the Loan Agreement. We have no borrowings under the Loan Agreement from the closing of the Loan Agreement through December 31, 2018.

As of December 31, 2018, our cash balance was $66.0 million. We had no short-term investments as of December 31, 2018.

As a result of the TVN acquisition, we assumed various debt instruments. The aggregate debt balance of such instruments at December 31, 2018 was $19.9 million, of which $0.2 million relates to obligations under capital leases with fixed interest rates. The remaining $19.7 million are debt instruments primarily financed by French government agencies, and, to a lesser extent, term loans from other financing institutions. These debt instruments have maturities ranging from three to seven years; expiring from 2019 through 2025. A majority of the loans are tied to the 1 month EURIBOR rate plus spread. (See Note 11, "Convertible notes, Other Debts and Capital Leases," of the notes to our Consolidated Balance Sheets for additional information). As of December 31, 2018, a hypothetical 1.0% increase in market interest rates on our debts subject to variable interest rate fluctuations would increase our interest expense by approximately $0.2 million annually.

As of December 31, 2018, we had $128.3 million aggregate principal amount of the Notes outstanding, which have a fixed 4.0% coupon rate.

Table of Content

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Index to Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Harmonic Inc.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheet of Harmonic Inc. and its subsidiaries (the Company) as of December 31, 2018 and the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for the year ended December 31, 2018, and the related notes (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 the results of its operations and its cash flows for the year 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 COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for revenue in 2018 due to the adoption of Accounting Standards Update (ASU) No. 2014-09, Revenue from Contracts with Customers (Topic 606), using the modified retrospective method.

Basis for Opinion

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 the accompanying Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audit. 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audit 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 audit 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides 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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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/Armanino LLP

We have served as the Company's auditor since 2018.

San Ramon, California

March 1, 2019

Table of Content

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Harmonic Inc.:
Opinion on the Financial Statements

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

Basis for Opinion

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

We conducted our audits of these consolidated financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.
/s/ PricewaterhouseCoopers LLP
San Jose, California
March 5, 2018

We served as the Company's auditor from 1989 to 2018.

Table of Content

HARMONIC INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except per share data)

	December 31,	
	2018	2017
ASSETS		
Current assets:		
Cash and cash equivalents	$65,989	$57,024
Accounts receivable, net	81,795	69,844
Inventories	25,638	25,976
Prepaid expenses and other current assets	23,280	18,931
Total current assets	196,702	171,775
Property and equipment, net	22,321	29,265
Goodwill	240,618	242,827
Intangibles, net	12,817	21,279
Other long-term assets	38,377	42,913
Total assets	$510,835	$508,059
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Other debts and capital lease obligations, current	$7,175	$7,610
Accounts payable	33,778	33,112
Income taxes payable	1,099	233
Deferred revenue	41,592	52,429
Accrued and other current liabilities	52,761	48,705
Total current liabilities	136,405	142,089
Convertible notes, long-term	114,808	108,748
Other debts and capital lease obligations, long-term	12,684	15,336
Income taxes payable, long-term	460	917
Other non-current liabilities	18,228	22,626
Total liabilities	282,585	289,716
Commitments and contingencies (Note 18)		
Stockholders' equity:		
Preferred stock, $0.001 par value, 5,000 shares authorized; no shares issued or outstanding	—	—
Common stock, $0.001 par value, 150,000 shares authorized; 87,057 and 82,554 shares issued and outstanding at December 31, 2018 and 2017, respectively	87	83
Additional paid-in capital	2,296,795	2,272,690
Accumulated deficit	(2,067,416)	(2,057,812)
Accumulated other comprehensive income (loss)	(1,216)	3,382
Total stockholders' equity	228,250	218,343
Total liabilities and stockholders' equity	$510,835	$508,059

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

Table of Content

HARMONIC INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share data)

	Year ended December 31,		
	2018	2017	2016
Revenue:			
Product	$252,067	$224,645	$285,260
Service	151,491	133,601	120,651
Total net revenue	403,558	358,246	405,911
Cost of revenue:			
Product	127,268	119,802	145,714
Service	67,081	68,624	59,447
Total cost of revenue	194,349	188,426	205,161
Total gross profit	209,209	169,820	200,750
Operating expenses:			
Research and development	89,163	95,978	98,401
Selling, general and administrative	118,952	136,270	144,381
Amortization of intangibles	3,187	3,142	10,402
Restructuring and related charges	2,918	5,307	14,602
Total operating expenses	214,220	240,697	267,786
Loss from operations	(5,011)	(70,877)	(67,036)
Interest expense, net	(11,401)	(11,078)	(10,628)
Other expense, net	(536)	(2,222)	(31)
Loss on impairment of long-term investments	—	(530)	(2,735)
Loss before income taxes	(16,948)	(84,707)	(80,430)
Provision for (benefit from) income taxes	4,087	(1,752)	(8,116)
Net loss	$(21,035)	$(82,955)	$(72,314)
Net loss per share:			
Basic and diluted	$(0.25)	$(1.02)	$(0.93)
Shares used in per share calculations:			
Basic and diluted	85,615	80,974	77,705

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

Table of Content

HARMONIC INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In thousands)

	Year ended December 31,		
	2018	2017	2016
Net loss	$(21,035)	$(82,955)	$(72,314)
Other comprehensive income (loss), before tax:			
Change in unrealized gain (loss) on cash flow hedges:			
Unrealized gain, net arising during the period	—	—	202
Loss reclassified into earnings	—	—	44
	—	—	246
Change in unrealized gain (loss) on available-for-sale securities:			
Unrealized loss, net arising during the period	—	(658)	(903)
Loss reclassified into earnings	—	384	2,735
	—	(274)	1,832
Adjustment to pension benefit plan	202	528	(279)
Unrealized foreign exchange gain (loss), net on intercompany long-term loans arising during the period	667	(1,705)	—
Change in foreign currency translation adjustments:			
Translation gain (loss) arising during the period	(5,100)	11,471	(4,633)
Loss reclassified into earnings	11	106	—
	(5,089)	11,577	(4,633)
Other comprehensive income (loss) before tax	(4,220)	10,126	(2,834)
Provision for (benefit from) income taxes	378	(526)	18
Other comprehensive income (loss), net of tax	(4,598)	10,652	(2,852)
Total comprehensive loss	$(25,633)	$(72,303)	$(75,166)

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

Table of Content

HARMONIC INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)

	Common Stock Shares	Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity
Balance at December 31, 2015	76,015	76	2,236,418	(1,903,908)	(4,418)	328,168
Net loss	—	—	—	(72,314)	—	(72,314)
Other comprehensive loss, net of tax	—	—	—	—	(2,852)	(2,852)
Issuance of common stock under option, stock award and purchase plans	2,441	2	2,798	—	—	2,800
Stock-based compensation	—	—	13,242	—	—	13,242
Issuance of warrant	—	—	1,597	—	—	1,597
Balance at December 31, 2016	78,456	78	2,254,055	(1,976,222)	(7,270)	270,641
Cumulative effect to retained earnings related to adoption of ASU 2016-09	—	—	69	(69)	—	—
Cumulative effect to retained earnings related to adoption of ASU 2016-16	—	—	—	1,434	—	1,434
Balance at January 1, 2017	78,456	78	2,254,124	(1,974,857)	(7,270)	272,075
Net loss	—	—	—	(82,955)	—	(82,955)
Other comprehensive income, net of tax	—	—	—	—	10,652	10,652
Issuance of common stock under option, stock award and purchase plans	4,098	5	1,954	—	—	1,959
Stock-based compensation	—	—	16,612	—	—	16,612
Balance at December 31, 2017	82,554	83	2,272,690	(2,057,812)	3,382	218,343
Cumulative effect to retained earnings related to adoption of ASC 606 (1)	—	—	—	11,431	—	11,431
Balance at January 1, 2018	82,554	83	2,272,690	(2,046,381)	3,382	229,774
Net loss	—	—	—	(21,035)	—	(21,035)
Other comprehensive loss, net of tax	—	—	—	—	(4,598)	(4,598)
Issuance of common stock under option, stock award and purchase plans	4,503	4	4,713	—	—	4,717
Stock-based compensation	—	—	17,097	—	—	17,097
Issuance of warrant	—	—	2,295	—	—	2,295
Balance at December 31, 2018	87,057	87	2,296,795	(2,067,416)	$ (1,216)	$ 228,250

(1) See Note 2, "Summary of Significant Accounting Policies-Recently Adopted Accounting Pronouncements," for more information on the adoption of ASC 606, Revenue from Contracts with Customers ("Topic 606") issued by the Financial Accounting Standards Board.

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

Table of Content

HARMONIC INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net loss	$(21,035)	$(82,955)	$(72,314)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Amortization of intangibles	8,367	8,322	14,836
Depreciation	12,971	14,599	18,819
Stock-based compensation	17,289	16,610	13,060
Amortization of discount on convertible debt	6,060	5,489	4,964
Provision for non-cash warrant	1,178	153	434
Restructuring, asset impairment and loss on retirement of fixed assets	1,491	1,906	2,305
Loss on impairment of long-term investments	—	530	2,735
Unrealized foreign exchange (gain) loss	(1,906)	2,369	(856)
Gain on pension curtailment	—	—	(1,955)
Deferred income taxes, net	661	2,189	(10,085)
Provision for doubtful accounts, returns and discounts	2,521	4,912	2,589
Provision for excess and obsolete inventories	1,649	6,005	6,871
Other non-cash adjustments, net	407	445	408
Changes in operating assets and liabilities, net of effects of acquisition:			
Accounts receivable	(14,700)	12,598	(2,563)
Inventories	(2,045)	11,687	(4,107)
Prepaid expenses and other assets	3,227	6,642	(1,892)
Accounts payable	1,018	3,432	5,793
Deferred revenues	(4,808)	(392)	18,106
Income taxes payable	440	(2,978)	(133)
Accrued and other liabilities	(501)	(8,499)	3,423
Net cash provided by operating activities	12,284	3,064	438
Cash flows from investing activities:			
Acquisition of business, net of cash and restricted cash acquired	—	—	(74,334)
Proceeds from maturities of investments	—	3,106	19,707
Proceeds from sales of investments	104	3,792	—
Purchases of property and equipment	(7,044)	(11,399)	(15,107)
Net cash used in investing activities	(6,940)	(4,501)	(69,734)
Cash flows from financing activities:			
Payment of convertible debt issuance cost	—	—	(582)
Proceeds from other debts and capital leases	5,066	6,344	5,968
Repayment of other debts and capital leases	(7,132)	(7,408)	(8,338)
Proceeds from common stock issued to employees	4,947	4,716	4,444
Payment of tax withholding obligations related to net share settlements of restricted stock units	(230)	(2,757)	(1,644)
Net cash provided by (used in) financing activities	2,651	895	(152)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(763)	1,879	(415)
Net increase (decrease) in cash, cash equivalents and restricted cash	7,232	1,337	(69,863)
Cash, cash equivalents and restricted cash, beginning of the year	58,757	57,420	127,283
Cash, cash equivalents and restricted cash, end of the year	$65,989	$58,757	$57,420
Supplemental disclosures of cash flow information:			

Income tax payments (refunds), net	$2,031	$2,141	$(54)
Interest payments, net	5,273	5,515	5,275
Supplemental schedule of non-cash investing and financing activities:			
Capital expenditures incurred but not yet paid	$148	$337	$394
Issuance of warrant	2,295	—	1,597
Reconciliation of cash, cash equivalents, and restricted cash to the consolidated balance sheets			
Cash and cash equivalents	$65,989	$57,024	$55,635
Restricted cash included in prepaid expenses and other current assets	—	530	732
Restricted cash included in other long-term assets	—	1,203	1,053
Total cash, cash equivalents and restricted cash	$65,989	$58,757	$57,420

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

61

Table of Content

HARMONIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
NOTE 1: DESCRIPTION OF BUSINESS
Harmonic Inc. (“Harmonic” or the “Company”) is a leading global provider of (i) versatile and high performance video delivery software, products, system solutions and services that enable our customers to efficiently create, prepare, store, playout and deliver a full range of high-quality broadcast and “over-the-top” (OTT) video services to consumer devices, including televisions, personal computers, laptops, tablets and smart phones and (ii) cable access solutions that enable cable operators to more efficiently and effectively deploy high-speed internet, for data, voice and video services to consumers’ homes.

The Company operates in two segments, Video and Cable Access. The Video business sells video processing and production and playout solutions and services worldwide to cable operators and satellite and telecommunications (telco) pay-TV service providers, which are collectively referred to as “service providers,” and to broadcast and media companies, including streaming media companies. The Video business infrastructure solutions are delivered either through shipment of our products, software licenses or as software-as-a-service (“SaaS”) subscriptions. The Cable Access business sells cable access solutions and related services, including our CableOS software-based cable access solution, primarily to cable operators globally.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES
Basis of Presentation
The accompanying consolidated financial statements of Harmonic include the accounts of the Company and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation. The Company’s fiscal quarters are based on 13-week periods, except for the fourth quarter which ends on December 31. On February 29, 2016, the Company completed the acquisition of Thomson Video Networks (“TVN”) and its results of operations are included in the Company’s Consolidated Statements of Operations beginning March 1, 2016.
Use of Estimates
The preparation of consolidated financial statements in conformity with generally accepted accounting principles in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.
Reclassifications
Certain prior period amounts have been reclassified to conform to the current year presentation. These reclassifications did not have material impact on previously reported financial statements.
Cash and Cash Equivalents
Cash and cash equivalents include all cash and highly liquid investments with maturities of three months or less at the date of purchase. The carrying amount of cash and cash equivalents approximates fair value because of the short maturity of those instruments.
Restricted Cash
The Company had no restricted cash balance as of December 31, 2018. The restricted cash balance as of December 31, 2017 was $1.7 million. The restricted cash serves as collateral for certain bank guarantees and they are invested in bank deposits and cannot be withdrawn from the Company’s accounts without the prior written consent of the applicable secured party. As of December 31, 2017, $0.5 million of the restricted cash balance was reported as a component of “Prepaid expenses and other current assets” and the remaining balance of $1.2 million was reported as a component of “Other long-term assets” on the Company’s Consolidated Balance Sheets.
Short-Term Investments
The Company did not have any outstanding short-term investments as of December 31, 2018 and 2017.

62

Table of Content

Investments in Equity Securities

From time to time, the Company may acquire certain equity investments for the promotion of business and strategic objectives and these investments may be in marketable equity securities or non-marketable equity securities. Effective January 1, 2018, the Company adopted Accounting Standard Update ("ASU") No. 2016-01, Financial Instruments (Topic 825): Recognition and Measurement of Financial Assets and Financial Liabilities, and accounts for its equity investments (except those accounted for under the equity method of accounting or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income. For equity investments that do not have readily determinable fair values, the Company measure these investments at cost minus impairment, if any, The Company's equity investments are classified as long-term investments and reported as a component of "Other long-term assets" on the Company's Consolidated Balance Sheets.

Prior to January 1, 2018, the Company accounted for its investments in entities that it did not have significant influence under the cost method. Investments in equity securities were carried at fair value if the fair value of the security is readily determinable. Unrealized gains and losses, net of taxes, on the long-term investments were included in the Company's Consolidated Balance Sheet as a component of accumulated other comprehensive loss. Investments in equity securities that did not qualify for fair value accounting or equity method accounting were accounted for under the cost method.

The Company's total investments in equity securities of other privately and publicly held companies were $3.6 million as of December 31, 2018 and 2017, respectively.

Liquidity

As of December 31, 2018, the Company's principal sources of liquidity consisted of cash and cash equivalents of $66.0 million, net accounts receivable of $81.8 million, its $15 million line of credit with Silicon Valley Bank and financing from French government agencies. As of December 31, 2018, the Company had $128.25 million in aggregate principal amount convertible senior notes outstanding (the "Notes"), which are due on December 1, 2020. The Notes bear interest at a fixed rate of 4.00% per year, payable semiannually in arrears on June 1 and December 1 of each year. The Company also had debts with French government agencies and to a lesser extent, with other financial institutions, primarily in France, in the aggregate of $19.9 million at December 31, 2018.

The Company's principal uses of cash will include repayments of debt and related interest, purchases of inventory, payroll, restructuring expenses, and other operating expenses related to the development and marketing of our products, purchases of property and equipment and other contractual obligations for the foreseeable future. The Company believes that its cash and cash equivalents of $66.0 million at December 31, 2018 will be sufficient to fund its principal uses of cash for at least the next 12 months. However, if its expectations are incorrect, it may need to raise additional funds to fund our operations, to take advantage of unanticipated strategic opportunities or to strengthen our financial position. Additional funds may not be available on terms favorable to us or at all.

Credit Risk and Major Customers/Supplier Concentration

Financial instruments which subject the Company to concentrations of credit risk consist primarily of cash, cash equivalents, short-term investments and accounts receivable. Cash, cash equivalents and short-term investments are invested in short-term, highly liquid, investment-grade obligations of commercial or governmental issuers, in accordance with the Company's investment policy. The investment policy limits the amount of credit exposure to any one financial institution, commercial or governmental issuer.

The Company's accounts receivable are derived from sales to worldwide cable, satellite, telco, and broadcast and media companies. The Company generally does not require collateral from its customers, and performs ongoing credit evaluations of its customers and provides for expected losses. The Company maintains an allowance for doubtful accounts based upon the expected collectability of its accounts receivable. Two customers had a balance greater than 10% of the Company's net accounts receivable balance as of December 31, 2018. No customer had a balance greater than 10% of the Company's net accounts receivable balance as of December 31, 2017. During the year ended December 31, 2018, Comcast accounted for more than 10% of the Company's revenue. No customer accounted for more than 10% of the Company's net revenue for the year ended December 31, 2017.

Certain of the components and subassemblies included in the Company's products are obtained from a single source or a limited group of suppliers. Although the Company seeks to reduce dependence on those sole source and limited source suppliers, the partial or complete loss of certain of these sources could have at least a temporary adverse effect on the Company's results of operations and damage customer relationships.

Table of Content

Revenue Recognition

On January 1, 2018, the Company adopted ASC 606, Revenue from Contracts with Customers ("Topic 606"), using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. Results for the reporting period beginning January 1, 2018 are presented under Topic 606, while prior period amounts are not restated and continue to be reported in accordance with our historic accounting under ASC 605, Revenue Recognition ("Topic 605"). (See "Recently Adopted Accounting Pronouncements" for additional information.)

Inventories

Inventories are stated at the lower of cost or net realizable value. Cost is computed using standard cost, which approximates actual cost, on a first-in, first-out basis. The cost of inventories is comprised of material, labor and manufacturing overhead. The Company's manufacturing overhead standards for product costs are calculated assuming full absorption of forecasted spending over projected volumes. The Company establishes provisions for excess and obsolete inventories to reduce such inventories to their estimated net realizable value after evaluation of historical sales, future demand and market conditions, expected product life cycles and current inventory levels. Such provisions are charged to cost of revenue in the Company's Consolidated Statements of Operations.

Capitalized Software Development Costs

External-use software. Research and development costs are generally charged to expense as incurred. The Company has not capitalized any such development costs because the costs incurred between the attainment of technological feasibility for the related software product through the date when the product is available for general release to customers has been insignificant.

Internal-use software. The Company capitalizes costs associated with internally developed and/or purchased software systems for internal use that have reached the application development stage. Capitalized costs include external direct costs of materials and services utilized in developing or obtaining internal-use software and payroll and payroll-related expenses for employees who are directly associated with and devote time to the internal-use software project. Capitalization of such costs begins when the preliminary project stage is complete and ceases no later than the point at which the project is substantially complete and ready for its intended purpose. These capitalized costs are amortized on a straight-line basis, generally three years.

During the years ended December 31, 2018 and December 31, 2017, the Company capitalized $0.9 million and $1.1 million, respectively, of its software development costs related to the development of its SaaS offerings. During the year ended December 31, 2016, research and development costs capitalized for internal use software was not significant.

Property and Equipment

Property and equipment are recorded at cost. Depreciation is computed using the straight-line method over the estimated useful lives of the assets. Estimated useful lives are generally, five years for furniture and fixtures, three years for software and four years for machinery and equipment. Depreciation for leasehold improvements are computed using the shorter of the remaining useful lives of the assets or the lease term of the respective assets.

Business Combination

The Company recognizes identifiable assets acquired and liabilities assumed at their acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of consideration transferred over the net of the acquisition date fair values of assets acquired and the liabilities assumed. Determining the fair value of assets acquired and liabilities assumed requires management's judgment and often involves the use of significant estimates and assumptions, including assumptions with respect to future cash inflows and outflows, discount rates, intangibles and other asset lives, among other items. Fair value is defined as the price that would be received in a sale of an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (an exit price). Market participants are assumed to be buyers and sellers in the principal (most advantageous) market for the asset or liability. Additionally, fair value measurements for an asset assume the highest and best use of that asset by market participants. As a result, the Company may have been required to value the acquired assets at fair value measurements that do not reflect its intended use of those assets. Use of different estimates and judgments could yield different results. Any excess of the purchase price over the fair value of the net assets acquired is recognized as goodwill.

Table of Content

Goodwill

As of December 31, 2018, the Company had goodwill of $240.6 million which represents the difference between the purchase price and the estimated fair value of the identifiable assets acquired and liabilities assumed. The Company tests for goodwill impairment at the reporting unit level on an annual basis, or more frequently if events or changes in circumstances indicate that the asset is more likely than not impaired. The Company has two reporting units, which are the same as its operating segments.

The Company's annual goodwill impairment test is performed in the fiscal fourth quarter, with a testing date at the end of fiscal October. In evaluating goodwill for impairment, the Company first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value (including goodwill). If the Company concludes that it is not more likely than not that the fair value of a reporting unit is less than its carrying value, then no further testing is required. However, if the Company concludes that it is more likely than not that the fair value of a reporting unit is less than its carrying value, then the two-step goodwill impairment test is performed to identify a potential goodwill impairment and measure the amount of impairment to be recognized, if any. The two-step impairment test involves estimating the fair value of all assets and liabilities of the reporting unit, including the implied fair value of goodwill, through either estimated discounted future cash flows or market-based methodologies.

There was no impairment of goodwill resulting from the Company's fiscal 2018 annual impairment testing in the fourth quarter of 2018. (See Note 7, "Goodwill and Identified Intangible Assets," for additional information).

Long-lived Assets

Long-lived assets represent property and equipment and purchased intangible assets. Purchased intangible assets from business combinations and asset acquisitions include customer contracts, trademarks and trade names, and maintenance agreements and related relationships, the amortization of which is charged to general and administrative expenses, and core technology and developed technology, the amortization of which is charged to cost of revenue. The Company evaluates the recoverability of intangible assets and other long-lived assets when indicators of impairment are present. When impairment indicators are present, the Company evaluates the recoverability of intangible assets and other long-lived assets on the basis of undiscounted cash flows expected to result from the use of each asset group and its eventual disposition. If the undiscounted expected future cash flows are less than the carrying amount of the asset, an impairment loss is recognized in order to write down the carrying value of the asset to its estimated fair market value. There were no impairment charges for long-lived assets in the years ended December 31, 2018, 2017 and 2016.

Foreign Currency

The functional currency of the Company's Israeli, Cayman and Swiss operations is the U.S. dollar. All other foreign subsidiaries use the respective local currency as the functional currency. When the local currency is the functional currency, gains and losses from translation of these foreign currency financial statements into U.S. dollars are recorded as a separate component of other comprehensive income (loss) in stockholders' equity.

The Company's foreign currency exposure is also related to its net position of monetary assets and monetary liabilities held by its subsidiaries in their nonfunctional currencies. These monetary assets and monetary liabilities are being remeasured into the functional currencies of the subsidiaries using exchange rates prevailing on the balance sheet date. Such remeasurement gains and losses are included in other expense, net in the Company's Consolidated Statements of Operations. During the years ended December 31, 2018, 2017 and 2016, the Company recorded remeasurement losses of approximately $0.6 million, $2.2 million and $0.2 million, respectively.

Derivative Instruments

The Company enters into derivative instruments, primarily foreign currency forward contracts, to minimize the short-term impact of foreign currency exchange rate fluctuations on certain foreign currency denominated assets and liabilities as well as certain foreign currencies denominated expenses. The Company does not enter into derivative instruments for trading purposes and these derivatives generally have maturities within twelve months.

The derivative instruments are recorded at fair value in prepaid expenses and other current assets or accrued and other current liabilities in the Company's Consolidated Balance Sheet. For derivative instruments designated and qualifying as cash flow hedges of forecasted foreign currency denominated transactions expected to occur within twelve months, the effective portion of the gain or loss on these hedges is reported as a component of "Accumulated other comprehensive loss" in stockholders' equity, and is reclassified into earnings when the hedged transaction affects earnings. If the transaction being hedged fails to occur, or if a portion of any derivative is (or becomes) ineffective, the gain or loss on the associated financial instrument is recorded immediately in earnings. For derivative instruments used to hedge existing foreign currency

65

denominated assets or liabilities, the gains or losses on these hedges are recorded immediately in earnings to offset the changes in the fair value of the assets or liabilities being hedged.

The Company did not enter into any cash flow hedges during the year ended December 31, 2018.

Research and Development

Research and development ("R&D") costs are expensed as incurred and consists primarily of employee salaries and related expenses, contractors and outside consultants, supplies and materials, equipment depreciation and facilities costs, all associated with the design and development of new products and enhancements of existing products. R&D expense was $89.2 million, $96.0 million and $98.4 million for the years ended December 31, 2018, 2017 and 2016, respectively.

The Company's TVN French Subsidiary participates in the French Crédit d'Impôt Recherche ("CIR") program which allows companies to monetize eligible research expenses. The R&D tax credits receivable from the French government for spending on innovative R&D under the CIR program is recorded as an offset to R&D expenses. In the years ended December 31, 2018, 2017 and 2016, the R&D expenses were net of $5.9 million, $5.9 million and $6.1 million of R&D tax credits, respectively.

Restructuring and Related Charges

The Company's restructuring charges consist primarily of employee severance, one-time termination benefits related to the reduction of its workforce, lease exit costs, and other costs. Liabilities for costs associated with a restructuring activity are recognized when the liability is incurred and are measured at fair value. One-time termination benefits are expensed at the date the entity notifies the employee, unless the employee must provide future service, in which case the benefits are expensed ratably over the future service period. Termination benefits are calculated based on regional benefit practices and local statutory requirements. Costs to terminate a lease before the end of its term are recognized when the entity terminates the contract in accordance with the contract terms. The Company determines the excess facilities accrual based on expected cash payments, under the applicable facility lease, reduced by any estimated sublease rental income for such facility. See Note 10, "Restructuring and related Charges" for additional information.

Warranty

The Company accrues for estimated warranty costs at the time of revenue recognition and records such accrued liabilities as part of cost of revenue. Management periodically reviews its warranty liability and adjusts the accrued liability based on the terms of warranties provided to customers, historical and anticipated warranty claims experience, and estimates of the timing and cost of warranty claims.

Advertising Expenses

All advertising costs are expensed as incurred and included in "Selling, general and administrative expenses" in the Company's Consolidated Statements of Operations. Advertising expense was $1.0 million, $0.7 million and $1.4 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Stock-based Compensation

The Company measures and recognizes compensation expense for all stock-based compensation awards made to employees, including stock options, restricted stock units ("RSUs") and awards related to the Company's Employee Stock Purchase Plan ("ESPP"), based upon the grant-date fair value of those awards.

Prior to January 1, 2017, stock-based compensation was recorded net of estimated forfeitures over the requisite service period and, accordingly, was recorded for only those stock-based awards that the Company expected to vest. Upon the adoption of ASU No. 2016-09, Compensation - Stock Compensation (Topic 718), issued by the Financial Accounting Standards Board ("FASB"), the Company changed its accounting policy to account for forfeitures as they occur. The change was applied on a modified retrospective approach with a cumulative effect adjustment of $69,000 to retained earnings as of January 1, 2017 (which increased the accumulated deficit).

The fair value of the Company's stock options and ESPP is estimated at grant date using the Black-Scholes option pricing model. The fair value of the Company's RSUs is calculated based on the market value of the Company's stock at the grant date. The fair value of the Company's market-based RSUs ("MRSUs") is estimated using the Monte-Carlo valuation model with market vesting conditions.

The Company recognizes the stock-based compensation for performance-based RSUs ("PRSUs") based on the probability of achieving certain performance criteria, as defined in the PRSU agreements. The Company estimates the number of PRSUs ultimately expected to vest and recognizes expense using the graded vesting attribution method over the requisite

Table of Content

service period. Changes in the estimates related to probability of achieving certain performance criteria and number of PRSUs expected to vest could significantly affect the related stock-based compensation expense from one period to the next.

Pension Plan

Under French law, the Company's subsidiaries in France, including the acquired TVN French Subsidiary, is obligated to provide for a defined benefit plan to its employees upon their retirement from the Company. The Company's defined benefit pension plan in France is unfunded.

The Company records its obligations relating to the pension plans based on calculations which include various actuarial assumptions including employees' age and period of service with the company; projected mortality rates, mobility rates and increases in salaries; and a discount rate. The Company reviews its actuarial assumptions on an annual basis as of December 31 (or more frequently if a significant event requiring remeasurement occurs) and modifies the assumptions based on current rates and trends when it is appropriate to do so. The Company believes that the assumptions utilized in recording its obligations under its pension plan are reasonable based on its experience, market conditions and input from its actuaries.

The Company accounts for the actuarial gains (losses) in accordance with ASC 715, "Compensation - Retirement Benefits". If the net accumulated gain or loss exceeds 10% of the projected plan benefit obligation, a portion of the net gain or loss is amortized and included in expense for the following year based upon the average remaining service period of active plan participants, unless the Company's policy is to recognize all actuarial gains (losses) when they occur. The Company elected to defer actuarial gains (losses) in accumulated other comprehensive income (loss). As of December 31, 2018, the Company did not meet the 10% requirement, and therefore no amortization of 2018 actuarial gain would be recorded in 2019.

See Note 12, "Employee Benefit Plans and Stock-based Compensation-French Retirement Benefit Plan," for additional information.

Income Taxes

In preparing the Company's financial statements, the Company estimates the income taxes for each of the jurisdictions in which the Company operates. This involves estimating the Company's current tax expense and assessing temporary and permanent differences resulting from differing treatment of items, such as reserves and accruals, for tax and accounting purposes. These temporary differences result in deferred tax assets and liabilities, which are included within the Company's Consolidated Balance Sheet.

The Company's income tax policy is to record the estimated future tax effects of temporary differences between the tax bases of assets and liabilities and amounts reported in the Company's accompanying Consolidated Balance Sheets, as well as operating loss and tax credit carryforwards. The Company follows the guidelines set forth in the applicable accounting guidance regarding the recoverability of any tax assets recorded on the Consolidated Balance Sheet and provides any necessary allowances as required. Determining necessary allowances requires the Company to make assessments about the timing of future events, including the probability of expected future taxable income and available tax planning opportunities. A history of operating losses in recent years has led to uncertainty with respect to our ability to realize certain of our net deferred tax assets, and as a result we applied a full valuation allowance against our U.S. net deferred tax assets as of December 31, 2018. In the event that actual results differ from these estimates or the Company adjusts these estimates in future periods, the Company's operating results and financial position could be materially affected.

The Company is subject to examination of its income tax returns by various tax authorities on a periodic basis. The Company regularly assesses the likelihood of adverse outcomes resulting from such examinations to determine the adequacy of its provision for income taxes. The Company has applied the provisions of the applicable accounting guidance on accounting for uncertainty in income taxes, which requires application of a more-likely-than-not threshold to the recognition and de-recognition of uncertain tax positions. If the recognition threshold is met, the applicable accounting guidance permits the Company to recognize a tax benefit measured at the largest amount of tax benefit that, in the Company's judgment, is more than 50% likely to be realized upon settlement. It further requires that a change in judgment related to the expected ultimate resolution of uncertain tax positions be recognized in earnings in the period of such change.

The Company files annual income tax returns in multiple taxing jurisdictions around the world. A number of years may elapse before an uncertain tax position is audited and finally resolved. While it is often difficult to predict the final outcome or the timing of resolution of any particular uncertain tax position, the Company believes that its reserves for income taxes reflect the most likely outcome. The Company adjusts these reserves and penalties, as well as the related interest, in light of changing facts and circumstances. Changes in the Company’s assessment of its uncertain tax positions or settlement of any particular position could materially and adversely impact the Company’s income tax rate, operating results, financial position and cash flows.

Table of Content

Segment Reporting

Operating segments are defined as components of an enterprise that engage in business activities for which separate financial information is available and is evaluated by the Chief Operating Decision Maker (“CODM”), which for the Company is its Chief Executive Officer, in deciding how to allocate resources and assess performance. The Company has two operating segments: Video and Cable Access.

Comprehensive Income (Loss)

Comprehensive income (loss) includes net income (loss) and other comprehensive income (loss). Other comprehensive income (loss) includes cumulative translation adjustments, unrealized foreign exchange gains and losses on intercompany long-term loans, unrealized gains and losses on certain foreign currency forward contracts that qualify as cash flow hedges and available-for-sale securities, as well as actuarial gains and losses on pension plan.

Recently Adopted Accounting Pronouncements

ASC Topic 606, “Revenue from Contracts with Customers”

On January 1, 2018, the Company adopted ASC 606, Revenue from Contracts with Customers (“Topic 606”), using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. Results for the reporting period beginning January 1, 2018 are presented under Topic 606, while prior period amounts are not restated and continue to be reported in accordance with our historic accounting under ASC 605, Revenue Recognition (“Topic 605”).

Under Topic 606, the Company began to recognize a contract asset for satisfied performance obligations that do not provide the Company with an unconditional right to consideration, which was restricted under the previous standard. In addition, the Company changed its revenue recognition for professional services from a completed contract method to a percentage of completion method.

The cumulative effect of initially applying Topic 606 to the Company’s consolidated balance sheet on January 1, 2018 was as follows (in thousands):

CONSOLIDATED BALANCE SHEETS	Balance as of December 31, 2017	Cumulative Impact from Adopting Topic 606	Balance as of January 1, 2018
ASSETS			
Accounts receivable, net	$ 69,844	$ 1,781	$ 71,625
Prepaid expenses and other current assets	18,931	3,578	22,509
Other long-term assets	42,913	773	43,686
LIABILITIES AND STOCKHOLDERS’ EQUITY			
Deferred revenue	$ 52,429	$ (4,826)	$ 47,603
Other non-current liabilities	22,626	(473)	22,153
Accumulated deficit	(2,057,812)	11,431	(2,046,381)

The impact from adopting Topic 606 on the Company’s consolidated financial statements was as follows (in thousands):

Table of Content

	Year ended December 31, 2018		
CONSOLIDATED STATEMENTS OF OPERATIONS	As Reported	Previous Accounting Guidance	Impact from Adopting Topic 606
Total net revenue	$ 403,558	$ 402,550	$ 1,008
Total cost of revenue	194,349	194,101	248
Total gross profit	209,209	208,449	760
Operating expenses:			
Selling, general and administrative	118,952	119,151	(199)
Loss from operations	(5,011)	(5,970)	959
Loss before income taxes	(16,948)	(17,907)	959
Net loss	(21,035)	(21,994)	959

	As of December 31, 2018		
CONSOLIDATED BALANCE SHEETS	As Reported	Previous Accounting Guidance	Impact from Adopting Topic 606
ASSETS			
Accounts receivable, net	81,795	79,954	$ 1,841
Prepaid expenses and other current assets	23,280	19,067	4,213
Other long-term assets	38,377	37,872	505
LIABILITIES AND STOCKHOLDERS' EQUITY			
Deferred revenue	41,592	47,117	(5,525)
Other non-current liabilities	18,228	18,534	(306)
Accumulated deficit	(2,067,416)	(2,079,806)	12,390

Revenue Recognition

The Company's principal sources of revenue are from the sale of hardware, software, hardware and software maintenance contracts, and end-to-end solutions, encompassing design, manufacture, test, integration and installation of products. The Company also derives recurring revenue from subscriptions, which are comprised of subscription fees from customers utilizing the Company's cloud-based video processing solutions.

Revenue from contracts with customers is recognized using the following five steps:

a) Identify the contract(s) with a customer;
b) Identify the performance obligations in the contract;
c) Determine the transaction price;
d) Allocate the transaction price to the performance obligations in the contract; and
e) Recognize revenue when (or as) the Company satisfies a performance obligation.

A contract contains a promise (or promises) to transfer goods or services to a customer. A performance obligation is a promise (or a group of promises) that is distinct. The transaction price is the amount of consideration a Company expects to be entitled from a customer in exchange for providing the goods or services.

The unit of account for revenue recognition is a performance obligation. A contract may contain one or more performance obligations, including hardware, software, professional services and support and maintenance. Performance obligations are accounted for separately if they are distinct. A good or service is distinct if the customer can benefit from the good or service either on its own or together with other resources that are readily available to the customer, and the good or service is distinct in the context of the contract. Otherwise performance obligations will be combined with other promised goods or services until the Company identifies a bundle of goods or services that is distinct.

Table of Content

The transaction price is allocated to all the separate performance obligations in an arrangement. It reflects the amount of consideration to which the Company expects to be entitled in exchange for transferring goods or services, which may include an estimate of variable consideration to the extent that it is probable of not being subject to significant reversals in the future based on the Company's experience with similar arrangements. The transaction price also reflects the impact of the time value of money if there is a significant financing component present in an arrangement. The transaction price excludes amounts collected on behalf of third parties, such as sales taxes.

Revenue is recognized when the Company satisfies each performance obligation by transferring control of the promised goods or services to the customer. Goods or services can transfer at a point in time or over time depending on the nature of the arrangement.

Deferred revenue represents the Company's obligation to transfer goods or services to a customer for which the Company has received consideration (or an amount of consideration is due) from the customer. Our payment terms vary by the type and location of our customer and the products or services offered. The term between invoicing and when payment is due is not significant. For certain products or services and customer types, we require payment before the products or services are delivered to the customer. Revenue recognized during the year ended December 31, 2018 that was included within the deferred revenue balance at January 1, 2018 was $46.9 million.

Contract assets exist when the Company has satisfied a performance obligation but does not have an unconditional right to consideration (e.g., because the entity first must satisfy another performance obligation in the contract before it is entitled to invoice the customer). Contract assets are reported as a component of "Prepaid expenses and other current assets" on the Consolidated Balance Sheets. See Note 9, "Certain Balance Sheet Components' for additional information.

Shipping and handling costs are accounted for as a fulfillment cost and are recorded in cost of revenue in the Company's Consolidated Statements of Operations. Sales tax and other amounts collected on behalf of third parties are excluded from the transaction price.

Hardware and Software. Revenue from the sale of hardware and software products is recognized when the control is transferred. For most of the Company's product sales (including sales to distributors and system integrators), the control is transferred at the time the product is shipped or delivery has occurred because the customer has significant risks and rewards of ownership of the asset and the Company has a present right to payment at that time. The Company's agreements with the distributors and system integrators have terms which are generally consistent with the standard terms and conditions for the sale of the Company's equipment to end users, and do not provide for product rotation or pricing allowances, as are typically found in agreements with stocking distributors. The Company offers return rights which are specifically identified and accrued for as sales returns at the end of the period.

Arrangements with Multiple Performance Obligations. The Company has revenue arrangements that include multiple performance obligations. The Company allocates transaction price to all separate performance obligations based on their relative standalone selling prices ("SSP"). The Company's best evidence for SSP is the price the Company charges for that good or service when the Company sells it separately in similar circumstances to similar customers. If goods or services are not always sold separately, the Company uses the best estimate of SSP in the allocation of transaction price. The objective of determining the best estimate of SSP is to estimate the price at which the Company would transact a sale if the product or service were sold on a standalone basis. The Company's process for determining best estimate of SSP involves management's judgment, and considers multiple factors including, but not limited to, major product groupings, geographies, gross margin objectives and pricing practices. Pricing practices taken into consideration include contractually stated prices, discounts offered and applicable price lists. These factors may vary over time, depending upon the unique facts and circumstances related to each deliverable. If the facts and circumstances underlying the factors considered change or should future facts and circumstances lead the Company to consider additional factors, the Company’s best estimate of SSP may also change.

Solution Sales. Solution sales for the design, manufacture, test, integration and installation of products, including equipment acquired from third parties to be integrated with Harmonic’s products, that are customized to meet the customer’s specifications are accounted for based on the percentage-of-completion basis, using the input method. Some of our arrangements may include acceptance provisions that require testing of the solution against specific performance criteria. The Company performs a detailed evaluation to determine whether the arrangement involves performance criteria based on our standard performance criteria. The Company has a long-standing history of entering into contractual arrangements to deliver the solution sales based on standard performance criteria. For this type of arrangement, we consider the customer acceptance clause not substantive and recognize product revenue when the customer takes possession on the product and recognize service on a percentage-of-completion basis using the input method. However, if the solution results in significant production,

Table of Content

modification or customization, we consider the arrangement as a single performance obligation and recognize the revenue at a point in time, depending on the complexity of the solution and nature of acceptance.

Professional services. Revenue from professional services is recognized over time, on the percentage-of-completion basis using the input method.

Input method. The use of the input method requires the Company to make reasonably dependable estimates. We use the input method based on labor hours, where revenue is calculated based on the percentage of total hours incurred in relation to total estimated hours at completion of the contract. The input method is reasonable because the hours best reflect the Company's efforts toward satisfying the performance obligation over time. As circumstances change over time, the Company updates its measure of progress to reflect any changes in the outcome of the performance obligation. Such changes to an entity's measure of progress are accounted for as a change in accounting estimates.

Support and maintenance. Support and maintenance services are satisfied ratably over time as the customer simultaneously receives and consumes the benefits of the services.

Contract costs. The incremental costs of obtaining a contract are capitalized if the costs are expected to be recovered. Costs that are recognized as assets are amortized straight-line over the period as the related goods or services transfer to the customer. Costs incurred to fulfill a contract are capitalized if they are not covered by other relevant guidance, relate directly to a contract, will be used to satisfy future performance obligations, and are expected to be recovered.

The Company recorded a net decrease to the opening balance of accumulated deficit of $1.4 million as of January 1, 2018 for capitalizing contract costs due to the cumulative impact of adopting Topic 606 for sales commissions related to customer contracts with an amortization period in excess of one year. Anticipated contract renewals, amendments, and follow-on contracts with the same customer are considered when determining the period of amortization.

The net capitalized contract costs as of December 31, 2018 were $1.6 million, of which $1.1 million and $0.5 million were reported as components of "Prepaid expenses and other current assets" and "Other long-term assets" on the Consolidated Balance Sheets, respectively. The amortization of the capitalized contract costs for the year ended December 31, 2018 was $1.3 million.

Significant Judgments. The Company has revenue arrangements that include promises to transfer multiple products and services to a customer. The Company may exercise significant judgment when determining whether products and services are considered distinct performance obligations that should be accounted for separately versus together.

The Company allocates the transaction price to all separate performance obligations based on the SSP of each obligation. The Company's best evidence for SSP is the price the Company charges for that good or service when the Company sells it separately in similar circumstances to similar customers. If goods or services are not always sold separately, the Company uses the best estimate of SSP in the allocation of the transaction price. The objective of determining the best estimate of SSP is to estimate the price at which the Company would transact a sale if the product or service were sold on a standalone basis. The Company's process for determining the best estimate of SSP involves management's judgment, and considers multiple factors including, but not limited to, major product groupings, geographies, gross margin objectives and pricing practices. Pricing practices taken into consideration include contractually stated prices, discounts and applicable price lists. These factors may vary over time, depending upon the unique facts and circumstances related to each deliverable. If the facts and circumstances underlying the factors considered change or should future facts and circumstances lead the Company to consider additional factors, the Company's best estimate of SSP may also change.

Practical Expedients and Exemptions. Under Topic 606, incremental costs of obtaining a contract such as sales commissions are capitalized if they are expected to be recovered, and amortized on a straight-line basis. Expensing these costs as incurred is not permitted unless they qualify for a practical expedient. Other than capitalized costs of obtaining subscription contracts which are amortized regardless of the life of expected amortization period, the Company elected the practical expedient to expense the costs to obtain all other contracts as incurred, when the life of the expected amortization period is one year or less by using a portfolio approach.

The Company elected the practical expedient under Topic 606 to not disclose the transaction price allocated to remaining performance obligations, since the majority of the Company’s arrangements have original expected durations of one year or less, or the invoicing corresponds to the value of the Company’s performance completed to date.

Table of Content

The Company elected the practical expedient that allows the Company to not assess a contract for a significant financing component if the period between the customer's payment and the transfer of the goods or services is one year or less.

See Note 17, "Segment Information" for further disaggregated revenue information.

Other Recently Adopted Accounting Pronouncements

In January 2016, the FASB issued ASU No. 2016-01, Financial Instruments (Topic 825): Recognition and Measurement of Financial Assets and Financial Liabilities, which requires equity investments to be measured at fair value with changes in fair value recognized in net income and simplifies the impairment assessment of equity investments without readily determinable fair values by requiring a qualitative assessment to identify impairment. The Company adopted this new standard in the first quarter of fiscal 2018, and the adoption did not have a material impact on its consolidated financial statements.

In November 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash, which requires entities to present the aggregate changes in cash, cash equivalents, restricted cash and restricted cash equivalents in the statement of cash flows. As a result, the statement of cash flows is required to present restricted cash and restricted cash equivalents as a part of the beginning and ending balances of cash and cash equivalents. The Company adopted this new standard in the first quarter of fiscal 2018 on a retrospective basis. The Company's total restricted cash balance was zero, $1.7 million and $1.8 million as of December 31, 2018, 2017 and 2016, respectively. These restricted cash balances are presented as a part of the ending and beginning balances of cash, cash equivalents and restricted cash on the Company's Consolidated Statements of Cash Flows for the corresponding periods. See Note 9, "Certain Balance Sheet Components" for additional information.

In January 2017, the FASB issued ASU No. 2017-01, Business Combinations (Topic 805): Clarifying the Definition of a Business. The objective of ASU 2017-01 is to clarify the definition of a business in order to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The definition of a business affects many areas of accounting including acquisitions, disposals, goodwill and consolidation. The Company adopted this new standard in the first quarter of fiscal 2018, and the adoption had no impact on its consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract. This new standard requires an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. Costs for implementation activities in the application development stage can be capitalized depending on the nature of the costs, while costs incurred during the preliminary project and post-implementation stages are expensed as the activities are performed. The costs capitalized are expensed over the term of the hosting arrangement. The amendments in the new ASU also require the entity to present the expense related to the capitalized implementation costs in the same line item in the statement of income as the fees associated with the hosting element (service) of the arrangement and classify payments for capitalized implementation costs in the statement of cash flows in the same manner as payments made for fees associated with the hosting element. This new standard is effective for the Company for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years and should be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. Early adoption is permitted, including adoption in any interim period.

The Company early adopted this new standard in the third quarter of fiscal 2018 and applied it prospectively to all implementation costs incurred after the date of adoption. The adoption of this standard did not have a significant impact on the Company's consolidated financial statements for the year ended December 31, 2018. Should the Company incur significant implementation costs in a cloud computing arrangement that is a service contract in future, the new standard could have a significant impact on the Company's consolidated financial statements.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842), to amend the existing accounting standard for lease accounting. This new standard will require lessees to recognize most leases on their balance sheets as a right-of-use asset with a corresponding lease liability, and lessors to recognize a net lease investment. Additional qualitative and quantitative disclosures will also be required.
The new standard is effective for the Company on January 1, 2019, with early adoption permitted. A modified retrospective transition approach is required, applying the new standard to all leases existing at the date of initial application. An entity may choose to use either (1) its effective date or (2) the beginning of the earliest comparative period presented in the

financial statements as its date of initial application. If an entity chooses the second option, the transition requirements for existing leases also apply to leases entered into between the date of initial application and the effective date. The entity must also recast its comparative period financial statements and provide the disclosures required by the new standard for the comparative periods. The Company expects to adopt the new standard on January 1, 2019 and use the effective date as the date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standard will not be provided for dates and periods before January 1, 2019.

The new standard provides a number of optional practical expedients in transition. The Company expects to elect the 'package of practical expedients', which permits the Company not to reassess under the new standard its prior conclusions about lease identification, lease classification and initial direct costs. The new standard also provides practical expedients for an entity's ongoing accounting. The Company currently expects to elect the short-term lease recognition exemption for all leases that qualify.

While the Company continues to assess all of the effects of adoption, the Company currently believes that the most significant effects on its consolidated financial statements relate to the recognition of the right-of-use assets and lease liabilities on its balance sheets for the operating leases, and providing significant new disclosures about the leasing activities. Based on our current lease portfolio, adoption of the standard is estimated to result in an increase in operating lease assets and liabilities of approximately $23 million with an insignificant impact on our Consolidated Statements of Operations. This estimate is subject to change as we finalize our implementation.

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments, which changes the impairment model for most financial assets and certain other instruments. For trade receivables and other instruments, the Company will be required to use a new forward-looking "expected loss" model. Additionally, credit losses on available-for-sale debt securities should be recorded through an allowance for credit losses limited to the amount by which fair value is below amortized cost. The new ASU will be effective for the Company beginning in the first quarter of fiscal 2020 and early adoption is permitted. The adoption of the new ASU is not expected to have a material impact on the Company's consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-04, Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. The new ASU removes Step 2 of the goodwill impairment test and requires the assessment of fair value of individual assets and liabilities of a reporting unit to measure goodwill impairments. Goodwill impairment will then be the amount by which a reporting unit's carrying value exceeds its fair value. The new ASU will be effective for the Company beginning in the first quarter of fiscal 2020 on a prospective basis, and early adoption is permitted. The Company is currently evaluating the impact of adopting the new ASU on its consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, Compensation-Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting. The new ASU expands the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. An entity should apply the requirements of Topic 718 to nonemployee awards except for specific guidance on inputs to an option pricing model and the attribution of cost. The new ASU will be effective for the Company beginning in the first quarter of fiscal 2019 and early adoption is permitted. The Company is currently evaluating the impact of adopting this new standard on its consolidated financial statements. The Company currently believes that the most significant effects on its consolidated financial statements relate to the accounting of Comcast warrants. The Company expects to complete related assessments before filing its Quarterly Report for the first quarter of fiscal 2019.

In August 2018, the SEC adopted the final rule under SEC Release No. 33-10532, Disclosure Update and Simplification, amending certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded. This final rule is effective on November 5, 2018. The release expanded the disclosure requirements on the analysis of stockholders' equity for interim financial statements. Under the release, an analysis of changes in each caption of stockholders' equity presented in the balance sheet must be provided in a note or separate statement. The analysis should present a reconciliation of the beginning balance to the ending balance of each period for which a statement of comprehensive income is required to be filed. According to the release, the staff of the SEC will not object if a filer's first presentation of changes in shareholders' equity is included in its Quarterly Report on Form 10-Q for the quarter that begins after the final rule’s effective date. The Company plans to first include the changes required by this release in its Quarterly Report on Form 10-Q for the first quarter of fiscal 2019.

Table of Content

NOTE 3: INVESTMENTS IN EQUITY SECURITIES

Unconsolidated Variable Interest Entities (“VIE”)

From time to time, the Company may enter into investments in entities that are considered variable interest entities under Accounting Standards Codification (ASC) Topic 810. If the Company is a primary beneficiary of a variable interest entity (“VIE”), it is required to consolidate the entity. To determine if the Company is the primary beneficiary of a VIE, the Company evaluates whether it has (1) the power to direct the activities that most significantly impact the VIE’s economic performance, and (2) the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE. The assessment of whether the Company is the primary beneficiary of its VIE requires significant assumptions and judgments.

EDC

In 2014, the Company acquired an 18.4% interest in Encoding.com, Inc. (“EDC”), a privately held video transcoding service company headquartered in San Francisco, California, for $3.5 million by purchasing EDC’s Series B preferred stock. EDC is considered a VIE but the Company determined that it is not the primary beneficiary of EDC. As a result, EDC is measured at its cost minus impairment, if any. The Company determined that there were no indicators at December 31, 2018 and 2017 that EDC investment was impaired.

NOTE 4: DERIVATIVES AND HEDGING ACTIVITIES

Derivatives Not Designated as Hedging Instruments (Balance Sheet Hedges)

The Company’s balance sheet hedges consist of foreign currency forward contracts which mature generally within three months, These forward contracts are carried at fair value and they are used to minimize the short-term impact of foreign currency exchange rate fluctuation on cash and certain trade and inter-company receivables and payables. Changes in the fair value of these foreign currency forward contracts are recognized in “Other expense, net” in the Consolidated Statement of Operations and are largely offset by the changes in the fair value of the assets or liabilities being hedged.

The locations and amounts of designated and non-designated derivative instruments’ gains and losses reported in the Company’s AOCI and Consolidated Statements of Operations are as follows (in thousands):

		Year ended December 31,		
	Financial Statement Location	2018	2017	2016
Derivatives not designated as hedging instruments:				
Gains (losses) recognized in income	Other expense, net	$(2,325)	$155	$343
Derivatives designated as hedging instruments [1]:				
Gains in AOCI on derivatives (effective portion)	AOCI	$—	$—	$202
Losses reclassified from AOCI into income (effective portion)	Cost of Revenue	$—	$—	$(6)
	Operating Expense	—	—	(38)
	Total	$—	$—	$(44)
Losses recognized in income on derivatives (ineffectiveness portion and amount excluded from effectiveness testing)	Other expense, net	$—	$—	$(63)

(1) The Company did not enter into any new cash flow hedge contracts since December 31, 2016.

The U.S. dollar equivalents of all outstanding notional amounts of foreign currency forward contracts are summarized as follows (in thousands):

	December 31,	
	2018	2017
Derivatives not designated as hedging instruments:		
Purchase	$28,975	$12,875
Sell	$—	$1,509

Table of Content

The locations and fair value amounts of the Company’s derivative instruments reported in its Consolidated Balance Sheets are as follows (in thousands):

	Balance Sheet Location	Asset Derivatives December 31, 2018	Asset Derivatives December 31, 2017	Balance Sheet Location	Liability Derivatives December 31, 2018	Liability Derivatives December 31, 2017
Derivatives not designated as hedging instruments:						
Foreign currency contracts	Prepaid expenses and other current assets	$ —	$ 33	Accrued and other current liabilities	$ 333	$ 4
		$ —	$ 33		$ 333	$ 4

Offsetting of Derivative Assets and Liabilities

The Company recognizes all derivative instruments on a gross basis in the Consolidated Balance Sheets. However, the arrangements with its counterparties allows for net settlement, which are designed to reduce credit risk by permitting net settlement with the same counterparty. As of December 31, 2018, information related to the offsetting arrangements was as follows (in thousands):

	Gross Amounts of Derivatives	Gross Amounts of Derivatives Offset in the Consolidated Balance Sheets	Net Amounts of Derivatives Presented in the Consolidated Balance Sheets
Derivative assets	$ —	$ —	$ —
Derivative liabilities	$ 333	$ —	$ 333

In connection with foreign currency derivatives entered in Israel, the Company’s subsidiaries in Israel are required to maintain a compensating balance with their bank at the end of each month. The compensating balance arrangements do not legally restrict the use of cash. As of December 31, 2018 and 2017, the total compensating balance maintained was $1.0 million.

NOTE 5: FAIR VALUE MEASUREMENTS

The applicable accounting guidance establishes a framework for measuring fair value and requires disclosure about the fair value measurements of assets and liabilities. This guidance requires the Company to classify and disclose assets and liabilities measured at fair value on a recurring basis, as well as fair value measurements of assets and liabilities measured on a nonrecurring basis in periods subsequent to initial measurement, in a three-tier fair value hierarchy as described below.

The guidance defines fair value as the exchange price that would be received for an asset or paid to transfer a liability, in the principal or most advantageous market for the asset or liability, in an orderly transaction between market participants on the measurement date.

Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The guidance describes three levels of inputs that may be used to measure fair value:

- Level 1 — Observable inputs that reflect quoted prices for identical assets or liabilities in active markets.
- Level 2 — Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. The forward exchange contracts are classified as Level 2 because they are valued using quoted market prices and other observable data for similar instruments in an active market.

Table of Content

- Level 3 — Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The carrying value of the Company’s financial instruments, including cash equivalents, restricted cash, accounts receivable, accounts payable and accrued and other current liabilities, approximate fair value due to their short maturities.

The Company uses the market approach to measure fair value for its financial assets and liabilities. The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities. The fair value of the Company’s convertible notes is influenced by interest rates, the Company’s stock price and stock market volatility. The fair values of the Company’s convertible notes as of December 31, 2018 and 2017 was $136.5 million and $129.9 million, based on the bond’s quoted market price as of December 31, 2018 and 2017, respectively, and represents a Level 2 valuation. The Company’s other debts assumed from the TVN acquisition are classified within Level 2 because these borrowings are not actively traded and the majority of them have a variable interest rate structure based upon market rates currently available to the Company for debt with similar terms and maturities, therefore, the carrying value of these debts approximate its fair value. The other debts, excluding capital leases, outstanding as of December 31, 2018 and 2017 were in the aggregate of $19.7 million and $21.8 million, respectively. See Note 11, “Convertible Notes, Other Debts and Capital Leases,” for additional information.

The fair value of the Company’s TVN defined pension benefit plan liability as of December 31, 2018 and 2017 was $4.9 million and $5.0 million, respectively. See Note 12, “Employee Benefit Plans and Stock-based Compensation-French Retirement Benefit Plan,” for additional information.

During the years ended December 31, 2018, 2017 and 2016 there were no nonrecurring fair value measurements of assets and liabilities subsequent to initial recognition.

The following tables provide the fair value measurement amounts for other financial assets and liabilities recorded in the Company’s Consolidated Balance Sheets based on the three-tier fair value hierarchy (in thousands):

	Level 1	Level 2	Level 3)	Total
As of December 31, 2018				
Accrued and other current liabilities				
Derivative liabilities	$ —	$333	$ —	$333
Total liabilities measured and recorded at fair value	$ —	$333	$ —	$333

	Level 1	Level 2	Level 3	Total
As of December 31, 2017				
Cash equivalents				
Money market funds	$ 22	$ —	$ —	$ 22
Prepaid expenses and other current assets				
Derivative assets	—	33	—	33
Total assets measured and recorded at fair value	$ 22	$ 33	$ —	$ 55
Accrued and other current liabilities				
Derivative liabilities	$ —	$ 4	$ —	$ 4
Total liabilities measured and recorded at fair value	$ —	$ 4	$ —	$ 4

The Company’s liability for the TVN VDP (as defined below) at December 31, 2018 and 2017 was $2.4 million and $5.1 million, respectively. This amount is not included in the table above because its fair value at inception, based on Level 3 inputs, was determined during the fourth quarter of fiscal 2016. Subsequently there is no recurring fair value remeasurement for this liability based on the applicable accounting guidance.

NOTE 6: BUSINESS ACQUISITION

On February 29, 2016, the Company completed its acquisition of TVN, a global leader in advanced video compression solutions headquartered in Rennes, France, for $82.5 million in cash. The acquisition strengthened the

Company's competitive position in the video infrastructure market and enhanced the depth and scale of the Company's research and development and service and support capabilities in the video arena.

Table of Content

During the fourth quarter of 2016, the Company completed the accounting for this business combination. The purchase price was allocated to tangible and intangible assets acquired and liabilities assumed on the basis of their respective estimated fair values on the acquisition date. The Company's allocation of TVN purchase consideration is as follows (in thousands):

Assets:	
Cash and cash equivalents	$6,843
Accounts receivable, net	14,933
Inventories	3,462
Prepaid expenses and other current assets	2,412
Property and equipment, net	9,942
French R&D tax credit receivables (1)	26,421
Other long-term assets	2,134
Total assets	$66,147
Liabilities:	
Other debts and capital lease obligations, current	8,362
Accounts payable	12,494
Deferred revenue	2,504
Accrued and other current liabilities	18,365
Other debts and capital lease obligations, long-term	16,087
Other non-current liabilities	6,467
Deferred tax liabilities	2,126
Total liabilities	$66,405
Goodwill	41,670
Intangibles	41,100
Total purchase consideration	$82,512

(1) See Note 9, "Certain Balance Sheet Components-Prepaid expenses and other current assets," for more information on French R&D tax credit receivables.

The following table presents details of the intangible assets acquired through this business combination (in thousands, except years):

	Estimated Useful Life	Fair Value
Backlog	6 months	$3,600
Developed technology	4 years	21,700
Customer relationships	5 years	15,200
Trade name	4 years	600
		$41,100

Acquired identifiable intangible assets were valued using the income method and are amortized on a straight line basis over their respective estimated useful lives. Goodwill of $41.7 million arising from the acquisition was derived from expected benefits from the business synergies to be derived from the combined entities and the experienced workforce who joined the Company in connection with the acquisition. The goodwill is not expected to be deductible for income tax purposes but the intangibles assets acquired are expected to be deductible for income tax purposes in certain jurisdictions. Both goodwill and intangibles assets acquired were assigned to the Company's video reporting unit.

Acquisition-and integration-related expenses

As a result of the TVN acquisition, the Company incurred acquisition-and integration-related expenses and these costs are expensed as incurred. Acquisition-related costs include outside legal, accounting and other professional services. The following table summarizes the acquisition-and integration-related expenses for the TVN acquisition (in thousands):

77

Table of Content

	Acquisition-related	Integration-related[1]	
	Year ended December 31, 2016	Year ended December 31, 2017 (unaudited)	Year ended December 31, 2016 (unaudited)
Cost of revenue	$ —	$ 342	$ 1,049
Research and development	—	7	974
Selling, general and administrative	3,855	2,469	11,058
Total acquisition- and integration-related expenses	$ 3,855	$ 2,818	$ 13,081

(1) Integration-related costs include incremental costs resulting from the TVN acquisition that are not expected to generate future benefits once the integration is fully consummated. All integration efforts were completed by 2017 and the Company does not expect any more such expenses to continue after 2017.

NOTE 7: GOODWILL AND IDENTIFIED INTANGIBLE ASSETS

Goodwill

Goodwill represents the difference between the purchase price and the estimated fair value of the identifiable assets acquired and liabilities assumed. Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment. The Company has two reporting units, Video and Cable Access.

The Company tests for goodwill impairment at the reporting unit level on an annual basis, or more frequently if events or changes in circumstances indicate that the asset is more likely than not impaired. The Company's annual goodwill impairment test is performed in the fiscal fourth quarter, with a testing date at the end of fiscal October. In evaluating goodwill for impairment, the Company first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value (including goodwill). If the Company concludes that it is not more likely than not that the fair value of a reporting unit is less than its carrying value, then no further testing is required. However, if the Company concludes that it is more likely than not that the fair value of a reporting unit is less than its carrying value, then the two-step goodwill impairment test is performed to identify a potential goodwill impairment and measure the amount of impairment to be recognized, if any. The two-step impairment test involves estimating the fair value of all assets and liabilities of the reporting unit, including the implied fair value of goodwill, through either estimated discounted future cash flows or market-based methodologies.

The changes in the Company's carrying amount of goodwill are as follows (in thousands):

	Video	Cable Access	Total
Balance as of December 31, 2016	$176,519	$60,760	$237,279
Foreign currency translation adjustment	5,493	55	5,548
Balance as of December 31, 2017	$182,012	$60,815	$242,827
Foreign currency translation adjustment	(2,173)	(36)	(2,209)
Balance as of December 31, 2018	$179,839	$60,779	$240,618

The Company has not recorded any impairment charges related to goodwill for any prior periods. If future economic conditions are different than those projected by management, future impairment charges may be required.

Intangible Assets, Net

The following table provides a summary of the Company's identified intangible assets (in thousands):

Table of Content

		December 31, 2018			December 31, 2017		
	Weighted Average Remaining Life (Years)	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Developed core technology	1.2	$31,707	$ (25,576)	$6,131	$31,707	$ (20,396)	$11,311
Customer relationships/contracts	2.2	44,650	(38,146)	6,504	44,819	(35,205)	9,614
Trademarks and tradenames	1.2	623	(441)	182	654	(300)	354
Maintenance agreements and related relationships	N/A	5,500	(5,500)	—	5,500	(5,500)	—
Order Backlog	N/A	3,112	(3,112)	—	3,177	(3,177)	—
Total identifiable intangibles		$85,592	$ (72,775)	$12,817	$85,857	$ (64,578)	$21,279

Amortization expense for the identifiable intangible assets was allocated as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Included in cost of revenue	$5,180	$5,180	$4,434
Included in operating expenses	3,187	3,142	10,402
Total amortization expense	$8,367	$8,322	$14,836

The estimated future amortization expense of identifiable intangible assets with definite lives as of December 31, 2018 is as follows (in thousands):

	Cost of Revenue	Operating Expenses	Total
Year ended December 31,			
2019	$ 5,180	$ 3,158	$8,338
2020	951	3,028	3,979
2021	—	500	500
Total future amortization expense	$ 6,131	$ 6,686	$12,817

NOTE 8: ACCOUNTS RECEIVABLE

Accounts receivable, net of allowances, consisted of the following (in thousands):

	December 31,	
	2018	2017
Accounts receivable, net:		
Accounts receivable	$85,292	$74,475
Less: allowance for doubtful accounts and sales returns	(3,497)	(4,631)
Total	$81,795	$69,844

Trade accounts receivable are recorded at invoiced amounts and do not bear interest. The Company generally does not require collateral and performs ongoing credit evaluations of its customers and provides for expected losses. The Company maintains an allowance for doubtful accounts based upon the expected collectability of its accounts receivable. The expectation of collectability is based on the Company's review of credit profiles of customers, contractual terms and conditions, current economic trends and historical payment experience. The Company offers return rights which are specifically identified and accrued for as sales returns at the end of the period.

The following table is a summary of activities in allowances for doubtful accounts and sales returns (in thousands):

Table of Content

	Balance at Beginning of Period	Charges to Revenue	Charges (Credits) to Expense	Additions to (Deductions from) Reserves	Balance at End of Period
Year ended December 31,					
2018	$ 4,631	$ 1,949	$ 572	$ (3,655)	$ 3,497
2017	$ 4,831	$ 4,030	$ 881	$ (5,111)	$ 4,631
2016	$ 4,340	$ 1,488	$ 1,100	$ (2,097)	$ 4,831

NOTE 9: CERTAIN BALANCE SHEET COMPONENTS

The following tables provide details of selected balance sheet components (in thousands):

	December 31, 2018	2017
Inventories:		
Raw materials	$1,705	$2,881
Work-in-process	991	933
Finished goods	12,267	10,130
Service-related spares	10,675	12,032
Total	$25,638	$25,976

	December 31, 2018	2017
Prepaid expenses and other current assets:		
French R&D tax credits receivable (1)	$7,305	$6,609
Contract assets (2)	3,834	—
Deferred cost of revenue	3,671	4,440
Prepaid maintenance, royalty, rent, property taxes and VAT	3,497	3,867
Capitalized commission	1,098	—
Restricted cash	—	530
Other	3,875	3,485
Total	$23,280	$18,931

(1) The Company’s TVN subsidiary in France (the “TVN French Subsidiary”) participates in the French Crédit d’Impôt Recherche (“CIR”) program (the “R&D tax credits”) which allows companies to monetize eligible research expenses. The R&D tax credits can be used to offset against income tax payable to the French government in each of the four years after being incurred, or if not utilized, are recoverable in cash. The amount of R&D tax credits recoverable are subject to audit by the French government and during the year ended December 31, 2018 and 2017, the French government approved the 2014 and 2013 claims and refunded $6.4 million to the TVN French Subsidiary in each of the periods, respectively. The remaining R&D tax credits receivable at December 31, 2018 were approximately $26.5 million and are expected to be recoverable from 2019 through 2022 with $7.3 million reported as a component of “Prepaid and other Current Assets” and $19.2 million reported as a component of “Other Long-term Assets” on the Company’s Consolidated Balance Sheets.

(2) Contract assets reflect the satisfied performance obligations for which the Company does not yet have an unconditional right to consideration.

Table of Content

	December 31, 2018	2017
Property and equipment, net:		
Machinery and equipment	$75,094	$87,121
Capitalized software	32,696	35,139
Leasehold improvements	14,951	15,051
Furniture and fixtures	6,049	6,534
Property and equipment, gross	128,790	143,845
Less: accumulated depreciation and amortization	(106,469)	(114,580)
Total	$22,321	$29,265

	December 31, 2018	2017
Other long-term assets:		
French R&D tax credits receivable	$19,249	$22,322
Deferred tax assets	8,695	10,462
Equity investment	3,593	3,593
Other	6,840	6,536
Total	$38,377	$42,913

	December 31, 2018	2017
Accrued and other current liabilities:		
Accrued employee compensation and related expenses	$21,451	$16,414
Accrued warranty	4,869	4,381
Customer deposits	4,642	5,020
Contingent inventory reserves	2,500	3,806
Accrued TVN VDP, current (1)	1,585	3,186
Accrued royalty payments	1,998	2,195
Accrued Avid litigation settlement fees, current	1,500	—
Other	14,216	13,703
Total	$52,761	$48,705

(1) See Note 10, “Restructuring and Related Charges-TVN VDP,” for additional information on the Company’s TVN VDP liabilities.

Table of Content

NOTE 10: RESTRUCTURING AND RELATED CHARGES

The Company has implemented several restructuring plans in the past few years. The goal of these plans was to bring operational expenses to appropriate levels relative to the Company's net revenues, while simultaneously implementing extensive company-wide expense control programs.

The Company accounts for its restructuring plans under the authoritative guidance for exit or disposal activities. The restructuring and asset impairment charges are included in "Cost of revenue" and "Operating expenses - Restructuring and related charges" in the Consolidated Statements of Operations. The following table summarizes the restructuring and related charges (in thousands):

	Year ended December 31,		
Restructuring and related charges in:	2018	2017	2016 (1)
Cost of revenue	$857	$1,279	$3,400
Operating expenses - Restructuring and related charges	2,918	5,307	14,602
Total restructuring and related charges	$3,775	$6,586	$18,002

(1) The restructuring and related charges for the fiscal year ended December 31, 2016 is net of $0.6 million and $1.4 million, in Cost of revenue and Operating expenses - Restructuring and related charges, respectively, of gain from TVN pension curtailment. See "Harmonic 2016 Restructuring Plan" below for additional information.

As of December 31, 2018 and December 31, 2017, the Company's total restructuring liability was $5.3 million and $8.0 million, respectively, of which $3.3 million and $4.4 million, respectively, were reported as a component of "Accrued and other current liabilities", and the remaining $2.0 million and $3.6 million, respectively, were reported as a component of "Other non-current liabilities" on the Company's Consolidated Balance Sheets.

The following table summarizes the activities related to the Company's restructuring plans during the fiscal year ended December 31, 2018 (in thousands):

	Harmonic 2016 Restructuring Plan		Harmonic 2017 Restructuring Plan		Harmonic 2018 Restructuring Plan		
	Excess facilities	TVN VDP	Excess facilities	Severance and benefits	Excess facilities	Severance and benefits	Total
Balance at December 31, 2017	$2,426	$5,128	$296	$ 193	$—	$ —	$8,043
Charges for current period	—	—	—	—	932	2,124	3,056
Adjustments to restructuring provisions	132	531	167	—	5	(116)	719
Reclassification of deferred rent	—	—	—	—	332	—	332
Cash payments	(1,015)	(3,066)	(146)	(193)	(203)	(2,052)	(6,675)
Foreign exchange effect	—	(184)	—	—	—	44	(140)
Balance at December 31, 2018	$1,543	$2,409	$317	$ —	$1,066	$ —	$5,335

Harmonic 2018 Restructuring

In the first quarter of 2018, the Company approved and implemented a restructuring plan (the "Harmonic 2018 Restructuring Plan"). The restructuring activities under this plan primarily include worldwide workforce reductions of the Company. As of December 31, 2018, the Company recorded an aggregate amount of $2.1 million of restructuring and related charges for severance and employee benefits for 59 employees worldwide, primarily in the United States and across all functions. The Company made $2.1 million in payments for this plan during the fiscal year ended December 31, 2018. The activities under this plan were completed in 2018.

82

Table of Content

Excess Facility in San Jose, California

In August 2018, the Company exited an additional excess facility at its U.S. headquarters in San Jose, California and recorded $0.9 million in facility exit costs. The Company accounts for facility exit costs in accordance with ASC 420, “Exit or Disposal Cost Obligations”, which requires that a liability for such costs be recognized and measured initially at fair value on the cease-use date based on remaining lease rentals, adjusted for the effects of any prepaid or deferred items recognized, reduced by the estimated sublease rentals that could be reasonably obtained even if it is not the intent to sublease. The fair value of these liabilities is based on a net present value model using a credit-adjusted, risk-free rate. Actual sublease terms may differ from the estimates originally made by the Company. Any future changes in the estimates or in the actual sublease income could require future adjustments to the liabilities, which would impact net income in the period the adjustment is recorded. As of the cease-use date, the fair value of this restructuring liability totaled $1.2 million. Offsetting these charges was an adjustment for deferred rent liability relating to this space of $0.3 million. As of December 31, 2018, the remaining liability for the additional excess facility exited in August 2018 was $1.1 million, which will be paid out over the remainder of the leased properties’ term through August 2020.

Harmonic 2017 Restructuring

In the third quarter of 2017, the Company implemented a restructuring plan (the “Harmonic 2017 Restructuring Plan”) to better align its operating costs with the continued decline in its net revenues. In 2017, the Company recorded $2.5 million of restructuring and related charges under this plan, consisting of $2.1 million of employee severance and $0.4 million related to the closure of one of the Company’s offices in New York. The activities under this plan were completed in 2017. During 2018, as a result of a change in the estimate of the sublease income, the restructuring liability related to the New York excess facility was increased by $0.2 million. As of December 31, 2018, the remaining $0.3 million liability under the Harmonic 2017 Restructuring Plan relates to the accrual for the New York excess facility, which will be paid out over the remainder of the leased properties’ term through August 2020.

Harmonic 2016 Restructuring

In the first quarter of 2016, the Company implemented a restructuring plan (the “Harmonic 2016 Restructuring Plan”) to reduce operating costs by consolidating duplicative resources in connection with the acquisition of TVN. The planned activities included global workforce reductions, exiting certain operating facilities and disposing of excess assets and an employee voluntary departure plan in France (the “TVN VDP”).
In 2016, the Company recorded an aggregate of $20.0 million of restructuring and related charges under the Harmonic 2016 Restructuring Plan, of which $2.2 million was primarily related to the exit from the excess facility at its U.S. headquarters and the remaining $17.8 million was related to severance and benefits for the termination of 118 employees worldwide, including 83 employees in France who participated in the TVN VDP. The restructuring and related charges under this plan were partially offset by approximately $2.0 million of gain from TVN pension curtailment. For the employees who participated in the TVN VDP, their pension benefit will be funded by the TVN VDP and as a result, the TVN defined benefit pension plan was remeasured at December 31, 2016, which resulted in a non-cash curtailment gain.
TVN VDP

The Company recorded 0.5 million, $1.8 million and $13.1 million of TVN VDP costs in the years ended December 31, 2018, 2017 and 2016, respectively. In aggregate, in 2018, 2017 and 2016, the Company had paid $13.8 million of TVN VDP costs. The TVN VDP liability balance as of December 31, 2018 was $2.4 million, payable from 2019 through 2020.
Excess Facility in San Jose, California

In January 2016, the Company exited an excess facility at its U.S. headquarters in San Jose, California and recorded $1.4 million in facility exit costs. The fair value of these liabilities is based on a net present value model using a credit-adjusted risk-free rate. The liability will be paid out over the remainder of the leased properties' term, which continues through August 2020. As of the cease-use date, the fair value of this restructuring liability totaled $2.5 million. Offsetting these charges was an adjustment for deferred rent liability relating to this space of $1.1 million. As a result of a change in the estimate of the sublease income, the restructuring liability was increased by $1.2 million as of December 31, 2017. As of December 31, 2018, the remaining liability for the excess facility exited in January 2016 was $1.5 million, which will be paid out over the remainder of the leased properties' term through August 2020.

Table of Content

NOTE 11: CONVERTIBLE NOTES, OTHER DEBTS AND CAPITAL LEASES

4.00% Convertible Senior Notes

In December 2015, the Company issued $128.25 million aggregate principal amount of 4.00% Senior Convertible Notes due 2020 (the "offering" or "Notes", as applicable) pursuant to an indenture (the "Indenture"), dated December 14, 2015, by and between the Company and U.S. Bank National Association, as trustee. The Notes bear interest at a rate of 4.00% per year, payable in cash on June 1 and December 1 of each year and the Notes will mature on December 1, 2020 unless earlier repurchased or converted. The Notes will be convertible into cash, shares of the Company's common stock, par value $0.001 ("Common Stock"), or a combination thereof, at the Company's election, at an initial conversion rate of 173.9978 shares of Common Stock per $1,000 principal amount of Notes (which is equivalent to an initial conversion price of approximately $5.75 per share). The conversion rate, and thus the effective conversion price, may be adjusted under certain circumstances, including in connection with conversions made following certain fundamental changes and under other circumstances, in each case, as set forth in the Indenture.

Prior to the close of business on the business day immediately preceding September 1, 2020, the Notes will be convertible only under the following circumstances: (1) during any fiscal quarter (and only during such fiscal quarter), if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on the last trading day of the immediately preceding fiscal quarter is greater than or equal to 130% of the conversion price of the Notes on each applicable trading day; (2) during the five business day period after any 5 consecutive trading day period (the " measurement period ") in which the trading price per $1,000 principal amount of Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the Company's common stock and the conversion rate on each such trading day; or (3) upon the occurrence of specified corporate events. Commencing on September 1, 2020 until the close of business on the second scheduled trading day immediately preceding the maturity date, the Notes will be convertible in multiples of $1,000 principal amount regardless of the foregoing circumstances.

If a fundamental change occurs, holders of the Notes may require the Company to purchase all or any portion of their Notes for cash at a repurchase price equal to 100% of the principal amount of the Notes to be repurchased, plus any accrued and unpaid interest to, but excluding, the fundamental change repurchase date.

Concurrent with the closing of the offering, the Company used $49.9 million of the net proceeds to repurchase 11.1 million shares of the Company's common stock from purchasers of Notes in the offering in privately negotiated transactions. In addition, the Company incurred approximately $4.1 million of debt issuance cost, resulting in net proceeds to the Company of approximately $74.2 million, which was used to fund the TVN acquisition.

In accordance with accounting guidance on embedded conversion features, the conversion feature associated with the Notes was valued at $26.1 million and bifurcated from the host debt instrument and recorded in stockholders' equity. The resulting debt discount on the Notes is being amortized to interest expense at the effective interest rate over the contractual terms of the Notes. The following table presents the components of the Notes as of December 31, 2018 and December 31, 2017 (in thousands, except for years and percentages):

	December 31,	
	2018	2017
Liability:		
Principal amount	$128,250	$128,250
Less: Debt discount, net of amortization	(11,996)	(17,404)
Less: Debt issuance costs, net of amortization	(1,446)	(2,098)
Carrying amount	$114,808	$108,748
Remaining amortization period (years)	1.9 years	2.9 years
Effective interest rate on liability component	9.94 %	9.94 %
Carrying amount of equity component	$26,062	$26,062

The following table presents interest expense recognized related to the Notes (in thousands):

84

Table of Content

	Year ended December 31,		
	2018	2017	2016
Contractual interest expense	$5,130	$5,130	$5,130
Amortization of debt discount	5,408	4,898	4,430
Amortization of debt issuance costs	652	591	534
Total interest expense recognized	$11,190	$10,619	$10,094

Other Debts and Capital Leases

The Company has a variety of debt and credit facilities in France to satisfy the financing requirements of TVN operations. These arrangements are summarized in the table below (in thousands):

	December 31,	
	2018	2017
Financing from French government agencies related to various government incentive programs (1)	$18,783	$20,565
Term loans	914	1,282
Obligations under capital leases	162	1,099
Total debt obligations	19,859	22,946
Less: current portion	(7,175)	(7,610)
Long-term portion	$12,684	$15,336

(1) Loans backed by French R&D tax credit receivables were $16.7 million and $17.7 million as of December 31, 2018 and 2017, respectively. As of December 31, 2018, the TVN French Subsidiary had an aggregate of $26.5 million of R&D tax credit receivables from the French government from 2019 through 2022. (See Note 9, "Certain Balance Sheet Components" for more information). These tax loans have a fixed rate of 0.6%, plus EURIBOR 1 month plus 1.3% and mature between 2019 through 2021. The remaining loans of $2.1 million and $2.9 million as of December 31, 2018 and 2017, respectively, primarily relate to financial support from French government agencies for R&D innovation projects at minimal interest rates, and the loans outstanding at December 31, 2018 mature between 2019 through 2025.

Future minimum repayments

The table below presents the future minimum repayments of other debts and capital lease obligations as of December 31, 2018 (in thousands):

Years ending December 31,	Capital lease obligations	Other Debt obligations
2019	91	7,084
2020	49	6,607
2021	22	5,333
2022	—	452
2023	—	155
Thereafter	—	66
Total	$ 162	$ 19,697

Line of Credit

On September 27, 2017, the Company entered into a Loan and Security Agreement (the "Loan Agreement") with Silicon Valley Bank (the "Bank"). The Loan Agreement provides for a secured revolving credit facility in an aggregate principal amount of up to $15.0 million. Under the terms of the Loan Agreement, the principal amount of loans, plus the face amount of any outstanding letters of credit, at any time cannot exceed up to 85% of the Company's eligible receivables. Under the terms of the Loan Agreement, the Company may also request letters of credit from the Bank. The proceeds of any loans under the Loan Agreement will be used for working capital and general corporate purposes.

Table of Content

Loans under the Loan Agreement will bear interest, at the Company's option, and subject to certain conditions, at an annual rate of either a prime rate or a LIBOR rate plus an applicable margin of 2.25%. There will be no applicable margin for prime rate advances when the Company is in compliance with the liquidity requirement of at least $20.0 million in the aggregate of consolidated cash plus availability under the Loan Agreement (the "Liquidity Requirement") and a 0.25% margin for prime rate advances when the Company is not in compliance with the Liquidity Requirement. The Company may not request LIBOR advances when it is not in compliance with the Liquidity Requirement. Interest on each advance is due and payable monthly and the principal balance is due at maturity. The Company's obligations under the revolving credit facility are secured by a security interest on substantially all of its assets, excluding intellectual property.

The Loan Agreement contains customary affirmative and negative covenants. The Company must comply with financial covenants requiring it to maintain (i) minimum a short-term asset to short-term liabilities ratio and (ii) minimum adjusted EBITDA, in the amounts and for the periods as set forth in the Loan Agreement. The Company must also maintain a minimum liquidity amount, comprised of unrestricted cash held at accounts with the Bank plus proceeds available to be drawn under the Loan Agreement, equal to $10.0 million at all times. As of December 31, 2018, the Company was in compliance with the covenants under the Loan Agreement.

As of December 31, 2018, the Company committed $1.8 million towards security for letters of credit issued under the Loan Agreement. There were no borrowings under the Loan Agreement from the closing of the Loan Agreement through December 31, 2018.

NOTE 12: EMPLOYEE BENEFIT PLANS AND STOCK-BASED COMPENSATION

Equity Award Plans

1995 Stock Plan

The 1995 Stock Plan provides for the grant of incentive stock options, non-statutory stock options and RSUs. Incentive stock options may be granted only to employees. All other awards may be granted to employees and consultants. Under the terms of the 1995 Stock Plan, no incentive stock option or non-statutory stock option may be granted in the ordinary course with a per share exercise price that is less than 100% of the fair value of the Company's common stock on the date of grant. RSUs have no exercise price. Both options and RSUs vest over a period of time as determined by the Company's Board of Directors (the "Board"), generally two to four years, and expire seven years from the date of grant. Grants of RSUs decrease the plan reserve by 1.5 shares for every unit or share granted, and any forfeitures of these awards due to their not vesting would increase the plan reserve by 1.5 shares for every unit or share forfeited. As of December 31, 2018, an aggregate of 9,915,865 shares of common stock were reserved for issuance under the 1995 Stock Plan, of which 3,819,736 shares remained available for grant.

2002 Director Plan

The 2002 Director Plan provides for the grant of non-statutory stock options and RSUs to non-employee directors of the Company. Under the terms of the 2002 Director Plan, no non-statutory stock option may be granted with a per share exercise price that is less than 100% of the fair value of the Company's common stock on the date of grant. RSUs have no exercise price. Both options and RSUs vest over a period of time as determined by the Board, generally three years for the initial grant and one year for subsequent grants to a non-employee director, and expire seven years from the date of grant. Grants of RSUs decrease the plan reserve by 1.5 shares for every unit granted, and any forfeiture of these awards due to their not vesting would increase the plan reserve by 1.5 shares for every unit forfeited. The Company's stockholders approved an amendment to the 2002 Director Stock Plan at the Company's 2018 annual meeting of stockholders ("2018 Annual Meeting") which increased the number of shares of common stock reserved for issuance under the 2002 Director Stock Plan by 400,000 shares. As of December 31, 2018, an aggregate of 947,536 shares of common stock were reserved for issuance under the 2002 Director Plan, of which 643,661 shares remained available for grant.

Employee Stock Purchase Plan

The 2002 Employee Stock Purchase Plan ("ESPP") provides for the issuance of share purchase rights to employees of the Company. The ESPP is intended to qualify as an "employee stock purchase plan" under Section 423 of the Internal Revenue Code. The ESPP enables employees to purchase shares at 85% of the fair market value of the Common Stock at the beginning or end of the offering period, whichever is lower. Offering periods generally begin on the first trading day on or after January 1 and July 1 of each year. Employees may participate through payroll deductions of 1% to 10% of their earnings. In the event that there are insufficient shares in the plan to fully fund the issuance, the available shares will be allocated across all participants based on their contributions relative to the total contributions received for the offering period. The Company's stockholders

Table of Content

approved an amendment to the ESPP at the 2018 Annual Meeting which increased the number of shares of common stock reserved for issuance under the ESPP by 1,300,000 shares. Under the ESPP, 1,132,438, 1,291,875 and 1,265,458 shares were issued during fiscal 2018, 2017 and 2016, respectively, representing $4.0 million, $4.4 million and $3.7 million in contributions. As of December 31, 2018, 1,282,358 shares were reserved for future purchases by eligible employees.

Stock Option Activities

The following table summarizes the Company's stock option activities and related information during the year ended December 31, 2018 (in thousands, except per share amounts and terms):

	Stock Options Outstanding			
	Number of Shares	Weighted Average Exercise Price (per share)	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Balance at December 31, 2017	3,880	$ 6.04		
Granted	—	—		
Exercised	(239)	3.79		
Forfeited	(35)	4.76		
Canceled or expired	(538)	8.75		
Balance at December 31, 2018	3,068	5.76	2.3	$ 1,148.7
As of December 31, 2018				
Vested and expected to vest	3,067	$ 5.76	2.3	$ 1,147.7
Exercisable	2,994	$ 5.78	2.3	$ 1,082.0

Aggregate intrinsic value represents the difference between the exercise price of the stock options and the fair value of the Company's common stock. The intrinsic value of options exercised during the years ended December 31, 2018, 2017 and 2016 was $0.3 million, $0.3 million and $0.1 million, respectively.

The Company realized no income tax benefit from stock option exercises for the years ended December 31, 2018, 2017 and 2016 due to recurring losses and valuation allowances.

Restricted Stock Units ("RSUs") Activities

The following table summarizes the Company's RSUs activities and related information during the year ended December 31, 2018 (in thousands, except per share amounts and terms):

	Restricted Stock Units Outstanding	
	Number of Shares	Weighted Average Grant Date Fair Value Per Share
Balance at December 31, 2017	2,904	$ 5.09
Granted	3,906	3.97
Vested	(3,177)	4.91
Forfeited	(230)	4.89
Balance at December 31, 2018	3,403	$ 3.99

The estimated fair value of RSUs is based on the market price of the Company's common stock on the grant date. The fair value of all restricted stock units vested during the years ended December 31, 2018, 2017 and 2016 was $15.6 million, $13.0 million and $9.7 million, respectively.

Performance- and Market-based awards

Starting 2015, the Company began to settle a portion of its incentive bonus payment to eligible employees by issuing PRSUs from the 1995 Stock Plan. The Company granted 1,443,168, 1,165,685 and 898,533 PRSUs to its employees during the years ended December 31, 2018, 2017 and 2016, respectively, of which 1,343,168, 1,165,685 and 610,579 PRSUs vested during the years ended December 31, 2018, 2017 and 2016, respectively, for the purpose of settling amounts earned under the Company's incentive bonus plans. The vesting of the remaining PRSUs will be based on the achievement of certain financial and non-financial operating goals of the Company, subject to the Board's approval. The stock-based compensation recognized for PRSUs were $6.1 million, $3.2 million and $2.8 million, for the years ended December 31, 2018, 2017 and 2016, respectively.

In 2017, the Company granted 344,500 MRSUs under the 1995 Stock Plan to its key executives and certain eligible employees that may vest during a three-year period as part of its long-term incentive program. In 2018, the Company granted 40,000 MRSUs that may vest during an eighteen-month period from the date of grant. The vesting conditions of these awards are based on the market value of the Company's common stock. The fair value of these shares was estimated using a Monte-Carlo simulation and the stock-based compensation recognized in 2018 and 2017 for these MRSUs was $0.2 million and $0.9 million, respectively. No MRSUs had vested as of December 31, 2018.

French Retirement Benefit Plan

Under French law, the Company's subsidiaries in France, including the acquired TVN French Subsidiary, are obligated to make certain payments to their employees upon their retirement from the Company. These payments are based on the retiring employee's salary for a number of months that varies according to the employee's period of service and position. Salary used in the calculation is the employee's average monthly salary for the twelve months prior to retirement. The payments are made in one lump-sum at the time of retirement. The French pension plan is unfunded and there are no contributions to the plan required by related laws or funding regulations. No required contributions are expected in fiscal 2019, but the Company, at its discretion, may make contributions to the defined benefit plan. The company's defined benefit pension obligations are measured as of December 31. The present value of these lump-sum payments is determined on an actuarial basis and the actuarial valuation takes into account the employees' age and period of service with the Company, projected mortality rates, mobility rates, increases in salaries and a discount rate.

The Company's pension obligations as of December 31, 2018 and December 31, 2017 and the changes to the Company's pension obligations for each of those years were as follows (in thousands):

	December 31,	
	2018	2017
Projected benefit obligation:		
Balance at January 1	$5,033	$4,264
Service cost	243	259
Interest cost	74	71
Actuarial (gains) losses	(202)	(528)
Benefits paid	(13)	—
Adjustment for prior year balance	—	343
Foreign currency translation adjustment	(254)	624
Balance at December 31	$4,881	$5,033
Presented on the Consolidated Balance Sheets under:		
Current portion (presented under "Accrued and other current liabilities")	$63	34
Long-term portion (presented under "Other non-current liabilities")	$4,818	4,999

The table below presents the components of net periodic benefit costs (in thousands):

	Year ended December 31,	
	2018	2017
Service cost	$243	$259

Interest cost	74	71
Amortization of net actuarial loss (gain) [(1)]	—	—
Net periodic benefit cost included in operating loss	$317	$330

Table of Content

(1) The Company uses the allowable 10% corridor approach to determine the amount of actuarial gains or losses subject to amortization in pension cost. Gains or losses are amortized on a straight-line basis over the average future remaining service period of active plan participants.

The following assumptions were used in determining the Company's pension obligation:

	December 31,	
	2018	2017
Discount rate	1.7%	1.5%
Mobility rate	6.0%	6.0%
Salary progression rate	2.0%	2.0%

The Company evaluates the discount rate assumption annually. The discount rate is determined using the average yields on high-quality fixed-income securities that have maturities consistent with the timing of benefit payments. The Company also evaluates other assumptions related to demographic factors, such as retirement age, mortality rates and turnover periodically, updating them to reflect experience and expectations for the future. The mortality assumption related to the Company's defined benefit pension plan used the most current mortality tables published by the French National Institute of Statistics and Economic Studies.

As of December 31, 2018, future benefits expected to be paid in each of the next five years, and in the aggregate for the five year period thereafter are as follows (in thousands):

Years ending December 31,	
2019	$63
2020	—
2021	41
2022	80
2023	479
2024 - 2028	2,626
	$3,289

401(k) Plan

The Company has a retirement/savings plan for its U.S. employees, which qualifies as a thrift plan under Section 401(k) of the Internal Revenue Code. This plan allows participants to contribute up to the applicable Internal Revenue Code limitations under the plan. The Company can make discretionary contributions to the plan of 25% of the first 4% contributed by eligible participants, up to a maximum contribution per participant of $1,000 per year. The Company's contributions to the plan were $0.3 million, $0.3 million and $0.4 million for fiscal 2018, 2017 and 2016, respectively.

Stock-based Compensation

The following table summarizes stock-based compensation expense for all plans (in thousands):

	Year ended December 31,		
	2018	2017	2016
Stock-based compensation in:			
Cost of revenue	$1,953	$2,370	$1,554
Research and development expense	5,192	5,313	3,711
Selling, general and administrative expense	10,144	8,927	7,795
Total stock-based compensation in operating expense	15,336	14,240	11,506
Total stock-based compensation recognized in net loss	$17,289	$16,610	$13,060

Table of Content

As of December 31, 2018, total unrecognized stock-based compensation cost related to unvested stock options and RSUs was $0.1 million and $8.5 million, respectively, and is expected to be recognized over a weighted-average period of 0.3 years and 1.5 years, respectively.

Valuation Assumptions

The Company estimates the fair value of employee stock options and stock purchase rights under the ESPP using a Black-Scholes option valuation model. The value of the stock purchase rights under the ESPP consists of: (1) the 15% discount on the purchase of the stock; (2) 85% of the fair value of the call option; and (3) 15% of the fair value of the put option. The call option and put option were valued using the Black-Scholes option pricing model. At the date of grant, the Company estimated the fair value of each stock option grant and stock purchase right granted under the ESPP using the following weighted average assumptions:

	Employee Stock Options		ESPP		
	2017	2016	2018	2017	2016
Expected term (in years)	4.30	4.30	0.50	0.50	0.50
Volatility	42 %	36 %	55 %	48 %	70 %
Risk-free interest rate	1.8 %	1.4 %	1.9 %	1.2 %	0.6 %
Expected dividends	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %

The expected term of the employee stock option represents the weighted-average period that the stock options are expected to remain outstanding. The computation of expected term was determined based on historical experience of similar awards, giving consideration to the contractual terms of the stock-based awards, vesting schedules and expectations of future employee behavior. The expected term of the stock purchase right under ESPP represents the period of time from the beginning of the offering period to the purchase date. The Company uses its historical volatility for a period equivalent to the expected term of the options to estimate the expected volatility. The risk-free interest rate that the Company uses in the Black-Scholes option valuation model is based on U.S. Treasury zero-coupon issues with remaining terms similar to the expected term. The Company has not paid and does not plan to pay any cash dividends in the foreseeable future.

There were no stock options granted during the year ended December 31, 2018. The weighted-average fair value per share of stock options granted for the years ended December 31, 2017 and 2016 was $1.85 and $0.99, respectively. The fair value of stock options vested during the years ended December 31, 2018, 2017 and 2016 was $0.7 million, $1.7 million and $2.3 million, respectively.

The estimated weighted-average fair value per share of stock purchase rights under the ESPP, granted for the years ended December 31, 2018, 2017 and 2016 was $1.33, $1.50 and $1.04, respectively.

NOTE 13: STOCKHOLDERS’ EQUITY

Preferred Stock

Harmonic has 5,000,000 authorized shares of preferred stock. No shares of preferred stock were issued or outstanding in any of the periods presented.

Common Stock Repurchases

Our stock repurchase program expired on December 31, 2016. No stock was repurchased during fiscal 2018, 2017 and 2016. Any further stock repurchases would require authorization from the Board.

Accumulated Other Comprehensive Income (Loss) (“AOCI”)

The components of AOCI, on an after-tax basis where applicable, were as follows (in thousands):

Table of Content

	December 31, 2018	December 31, 2017
Foreign currency translation adjustments	$(779)	$4,310
Unrealized foreign exchange loss on intercompany long-term loans, net of taxes	(888)	(1,177)
Actuarial gain	451	249
Total accumulated other comprehensive income (loss)	$(1,216)	$3,382

NOTE 14: INCOME TAXES

Loss from operations before income taxes consists of the following (in thousands):

	Year ended December 31, 2018	2017	2016
United States	$(19,780)	$(50,041)	$(53,833)
International	2,832	(34,666)	(26,597)
Loss before income taxes	$(16,948)	$(84,707)	$(80,430)

The components of the benefit from income taxes consist of the following (in thousands):

	Year ended December 31, 2018	2017	2016
Current:			
Federal	$(305)	$(4,530)	$(950)
State	116	129	181
International	2,958	273	2,738
Deferred:			
Federal	—	—	(713)
International	1,318	2,376	(9,372)
Total provision for (benefit from) income taxes	$4,087	$(1,752)	$(8,116)

The differences between the provision for (benefit from) income taxes computed at the U.S. federal statutory rate at 21% and the Company's actual provision for (benefit from) income taxes are as follows (in thousands):

	Year ended December 31, 2018	2017	2016
Benefit from for income taxes at U.S. Federal statutory rate	$(3,559)	$(29,648)	$(28,150)
Differential in rates on foreign earnings	4,299	15,920	11,741
Non-deductible amortization expense	—	—	617
Tax Reform tax rate reduction	—	14,527	—
Change in valuation allowance	1,449	(2,834)	4,465
Change in liabilities for uncertain tax positions	(250)	(2,009)	(960)
Non-deductible stock-based compensation	1,363	1,934	1,480
Permanent Differences	1,096	380	441
Adjustments related to tax positions taken during prior years	184	(473)	(163)
Adjustments made under intercompany transactions	—	—	1,779
Tax refund	(305)	(834)	—
Other	(190)	1,285	634
Total provision for (benefit from) income taxes	$4,087	$(1,752)	$(8,116)

The Company operates in multiple jurisdictions and its profits are taxed pursuant to the tax laws of these jurisdictions. The Company's effective income tax rate may be affected by changes in its interpretations of tax laws and tax agreements in

Table of Content

any given jurisdiction, utilization of net operating loss and tax credit carry forwards, changes in geographical mix of income and expense, and changes in management's assessment of matters such as the ability to realize deferred tax assets. The Company’s effective tax rate varies from year to year primarily due to the absence of several onetime, discrete items that benefited or decremented the tax rates in the previous years.

In 2018, the Company had a worldwide consolidated loss before tax of $16.9 million and tax expense of $4.1 million, with an annual effective income tax rate of (24)%. The Company’s 2018 effective income tax rate differed from the U.S. federal statutory rate of 21% primarily due to geographical mix of income and losses, full valuation allowance against U.S. federal, California and other states deferred tax assets, foreign withholding taxes and income taxes on earnings from operations in foreign tax jurisdictions.

On December 22, 2017, the Tax Cuts and Jobs Act (the “TCJA”) was enacted which, among other things, lowered the U.S. federal corporate income tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign sourced earnings. As of December 31, 2018, the Company completed the accounting for transition tax and concluded that it had no tax impact because the Company's cumulative unremitted earnings and profits are negative.

The TCJA also includes a requirement to pay a minimum tax on foreign earnings for tax years beginning after December 31, 2017. An accounting policy election is allowed to either treat taxes due on future U.S. inclusions as a current period expense or account for the minimum tax in the measurement of deferred tax assets. The Company has elected to treat the minimum tax as a period cost. As such, the Company has not recognized any deferred taxes related to the minimum tax.

In 2017, the Company had a worldwide consolidated loss before tax of $84.7 million and tax benefit of $1.8 million, with an annual effective tax rate of 2%. The Company’s 2017 effective income tax rate differed from the U.S. federal statutory rate of 35% primarily due to geographical income mix, favorable tax rates associated with certain earnings from operations in lower-tax jurisdictions, tax rate change in foreign jurisdictions, tax benefits associated with the release of tax reserves for uncertain tax positions resulting from the expiration of the statutes of limitations, a one-time benefit of $2.6 million from the reduction of a valuation allowance on alternative minimum tax (“AMT”) credit carryforwards that will be refundable as a result of the TCJA, partially offset by the increase in the valuation allowance against U.S. federal, California and other state deferred tax assets, detriment from non-deductible stock-based compensation, and the net of various other discrete tax adjustments.

In 2016, the Company had a worldwide consolidated loss before tax of $80.4 million and tax benefit of $8.1 million, with an annual effective income tax rate of 10%. The Company’s 2016 effective income tax rate differed from the U.S. federal statutory rate of 35% primarily due to geographical income mix and its tax valuation allowance, favorable tax rates associated with certain earnings from operations in lower-tax jurisdictions, favorable resolutions of uncertain tax positions, and the tax benefit from the realization of certain deferred tax assets as a result of the TVN acquisition, partially offset by the increase in the valuation allowance against U.S. federal, California and other state deferred tax assets, detriment from non-deductible stock-based compensation, non-deductible amortization of foreign intangibles, and the net of various discrete tax adjustments.

The components of net deferred tax assets included in the Consolidated Balance Sheets are as follows (in thousands):

	December 31,	
	2018	2017
Deferred tax assets:		
Reserves and accruals	$17,090	$17,247
Net operating loss carryforwards	29,900	34,915
Research and development credit carryforwards	36,446	34,419
Deferred stock-based compensation	2,201	2,677
Intangibles	2,585	2,062
Other	939	1,441
Gross deferred tax assets	89,161	92,761
Valuation allowance	(77,144)	(77,756)

Gross deferred tax assets after valuation allowance	12,017	15,005
Deferred tax liabilities:		
Depreciation and amortization	(391)	(259)
Convertible notes	(2,931)	(4,284)
Gross deferred tax liabilities	(3,322)	(4,543)
Net deferred tax assets	$8,695	$10,462

92

Table of Content

The following table summarizes the activities related to the Company's valuation allowance (in thousands):

	Year ended December 31,		
	2018	2017	2016
Balance at beginning of period	$77,756	$74,480	$64,545
Additions	928	9,028	18,291
Deductions	(1,540)	(5,752)	(8,356)
Balance at end of period	$77,144	$77,756	$74,480

Management regularly assesses the ability to realize deferred tax assets recorded based upon the weight of available evidence, including such factors as recent earnings history and expected future taxable income on a jurisdiction by jurisdiction basis. In the event that the Company changes its determination as to the amount of realizable deferred tax assets, the Company will adjust its valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

In 2018, the Company continued to record a valuation allowance against all of its United States deferred tax assets due to significant cumulative losses in the United States, resulting in a net increase in valuation allowance of $0.9 million. This increase in valuation allowance is offset partially by the release of $1.5 million valuation allowance against one of its Israel subsidiaries due to cumulative income generated in the recent years as well as the analysis of all available positive and negative evidence. As of December 31, 2018, the Company had a valuation allowance of $77.1 million against all of its U.S. federal, California and other states net deferred tax assets.

The Company adopted ASU No. 2016-09, Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting, using a modified-retrospective transition method, in the first quarter of fiscal 2017. As a result, the Company recorded a cumulative effect of $4.6 million of additional gross deferred tax asset associated with shared-based payment and an offsetting valuation allowance of the same amount, therefore resulting in no net impact to the Company's beginning retained earnings or effective tax rate for 2017.

In October 2016, the FASB issued ASU No. 2016-16, Income Taxes (topic 740): Intra-Entity Transfers of Assets Other Than Inventory, which requires companies to recognize the income tax consequences of all intra-entity sales of assets other than inventory when they occur. As a result, a reporting entity would recognize the tax expense from the sale of the asset in the seller's tax jurisdiction when the transfer occurs, even though the pre-tax effects of that transaction are eliminated in consolidation. Any deferred tax asset that arises in the buyer's jurisdiction would also be recognized at the time of the transfer. The Company early adopted this ASU during the first quarter of fiscal 2017 on a modified retrospective approach and recorded a cumulative-effect adjustment of $1.4 million to the retained earnings as of January 1, 2017 (which reduced the accumulated deficit). Correspondingly, in the first quarter of fiscal 2017, the Company recognized an additional $1.1 million of net deferred tax assets, after netting with $2.1 million of valuation allowance, and write off the remaining $0.3 million of unamortized tax expenses deferred under the previous guidance to provision for income taxes in the first quarter of fiscal 2017.

On July 27, 2015, the U.S. Tax Court issued an opinion in Altera Corp. v. Commissioner, 145 T.C. No.3 (2015) related to the treatment of stock-based compensation expense in an intercompany cost-sharing arrangement. A final decision was entered by the U.S. Tax Court on December 1, 2015 (the "2015 Decision"). On February 19, 2016, the U.S. Internal Revenue Service filed a notice of appeal in Altera Corp. v. Commissioner, 145 T.C. No. 3 (2015), to the Ninth Circuit Court of Appeals. The Ninth Circuit was to decide whether a regulation that mandates that stock-based compensation costs related to the intangible development activity of a qualified cost sharing arrangement (a "QCSA") must be included in the joint cost pool of the QCSA (the "all costs rule") is consistent with the arm's length standard as set forth in Section 482 of the Internal Revenue Code. On July 24, 2018, the Ninth Circuit Court of Appeals issued an opinion in Altera Corp. v. Commissioner (the "Altera Opinion") requiring related parties in an intercompany cost-sharing arrangement to share expenses related to share-based compensation. This opinion reversed the 2015 Decision of the United States Tax Court. The Ninth Circuit subsequently withdrew the opinion on August 7, 2018. Due to uncertainties surrounding the ultimate resolution of the 2015 Decision, the Company continues to share expenses related to share-based compensation despite the 2015 Decision.

As of December 31, 2018, the Company had $95.9 million, $38.0 million, $21.6 million and $48.0 million of foreign, U.S. federal, U.S. California state, and U.S. other states net operating loss carryforwards (“NOL”), respectively. There is no expiration to the utilization of the foreign NOL, while the U.S. federal and California NOL begin to expire at various dates beginning in 2026 through 2039, if not utilized.

Table of Content

As of December 31, 2018, the Company had U.S. federal and California state tax credit carryforwards of approximately $13.2 million and $34.9 million, respectively. If not utilized, the U.S. federal tax credit carryforwards will begin to expire in 2031, while the California tax credit forward will not expire.

The Company has not provided U.S. state income taxes and foreign withholding taxes, on approximately $15.3 million of cumulative earnings for certain non-U.S. subsidiaries, because such earnings are intended to be indefinitely reinvested. Determination of the amount of unrecognized deferred tax liability for temporary differences related to investments in these non-U.S. subsidiaries that are essentially permanent in duration is not practicable.

The Company applies the provisions of the applicable accounting guidance regarding accounting for uncertainty in income taxes, which require application of a more-likely-than-not threshold to the recognition and derecognition of uncertain tax positions. If the recognition threshold is met, the applicable accounting guidance permits the recognition of a tax benefit measured at the largest amount of such tax benefit that, in our judgment, is more than fifty percent likely to be realized upon settlement. It further requires that a change in judgment related to the expected ultimate resolution of uncertain tax positions to be recognized in earnings in the period in which such determination is made. The Company will continue to review its tax positions and provide for, or reverse, unrecognized tax benefits as issues arise. As of December 31, 2018, the Company had $16.6 million of unrecognized future tax benefits that would favorably impact the effective tax rate in future periods if recognized. The following table summarizes the activities related to the Company's gross unrecognized tax benefits (in millions):

	Year ended December 31,		
	2018	2017	2016
Balance at beginning of period	$18.8	$19.2	$15.6
Increase in balance related to tax positions taken during current year	1.0	1.4	4.6
Decrease in balance as a result of a lapse of the applicable statues of limitations	(0.1)	(2.2)	(1.0)
Decrease in balance due to settlement with tax authorities	(1.6)	—	—
Increase in balance related to tax positions taken during prior years	0.2	1.8	—
Decrease in balance related to tax positions taken during prior years	(0.3)	(1.4)	—
Balance at end of period	$18.0	$18.8	$19.2

The Company recognizes interest and penalties related to unrecognized tax positions in income tax expenses on the Consolidated Statements of Operations. The net interest and penalties charges recorded for the years ended December 31, 2016 through 2018, were not material. The Company had approximately $24.0 thousand and $0.5 million of accrued interest and penalties related to uncertain tax positions as of December 31, 2018 and December 31, 2017.

The 2015 through 2018 tax years generally remain subject to examination by U.S. federal and most state tax authorities. In addition, a subsidiary of the Company is under audit from 2013 to 2017 tax years by the Swiss tax authority. If, upon the conclusion of this audit, the ultimate determination of taxes owed in Switzerland is for an amount in excess of the tax provision the Company has recorded in the applicable period, the Company's overall tax expense, effective tax rate, operating results and cash flow could be materially and adversely impacted in the period of adjustment.

The Company's operations in Switzerland are subject to a reduced tax rate under the Switzerland tax holiday which requires various thresholds of investment and employment in Switzerland. The Company has substantially met these various thresholds and the Switzerland tax holiday is effective through the end of 2018. The income tax benefits attributable to the Switzerland holiday were estimated to be approximately $0.4 million, $0.6 million and $0.7 million for each of the fiscal years 2018, 2017 and 2016, increasing diluted earnings per share by approximately $0.005, $0.007 and $0.008 for each of the fiscal years 2018, 2017 and 2016, respectively.

NOTE 15: NET LOSS PER SHARE

Basic net loss per share is computed by dividing the net loss attributable to common stockholders for the applicable period by the weighted average number of common shares outstanding during the period. Potentially dilutive shares, consisting of outstanding stock options, restricted stock units, ESPP plan awards as well as the Notes, are excluded

from the net loss per share computations when their effect is anti-dilutive.
The following table presents the calculation of basic and diluted net loss per share (in thousands, except per share amounts):

94

Table of Content

	Year Ended December 31,		
	2018	2017	2016
Numerator:			
Net loss	$(21,035)	$(82,955)	$(72,314)
Denominator:			
Weighted average number of shares outstanding:			
Basic and diluted	85,615	80,974	77,705
Net loss per share:			
Basic and diluted	$(0.25)	$(1.02)	$(0.93)

The diluted net loss per share is the same as basic net loss per share for the years ended December 31, 2018, 2017 and 2016, as the effect of inclusion of potential common shares outstanding would have been anti-dilutive due to the Company's net losses for the years presented. The following table sets forth the potential weighted common shares outstanding that were excluded from the computation of basic and diluted net loss per share calculations (in thousands):

	December 31,		
	2018	2017	2016
Stock options	3,327	4,470	5,295
Restricted stock units	2,997	3,059	2,536
Stock purchase rights under the ESPP	609	620	659
Warrants (1)	1,268	782	206
Total (2)	8,201	8,931	8,696

(1) In 2016, in connection with the execution of a product supply agreement the Company granted Comcast a warrant to purchase shares of its common stock. See Note 16, "Warrants," for additional information. The warrants will have a dilutive impact on diluted net income per share when the Company's average market price of its common stock for a given period exceeds the warrant exercise price of $4.76 per share.

(2) Excluded from the table above are the Notes, which are convertible under certain conditions into an aggregate of 22,304,348 shares of common stock. See Note 11, "Convertible Notes, Other Debts and Capital Leases," for additional information on the Notes. Since the Company's intent is to settle the principal amount of the Notes in cash, the treasury stock method is being used to calculate any potential dilutive effect of the conversion spread on diluted net income per share, if applicable. The conversion spread will have a dilutive impact on diluted net income per share when the Company's average market price of its common stock for a given period exceeds the conversion price of $5.75 per share.

NOTE 16: WARRANTS

On September 26, 2016, the Company granted a warrant to purchase shares of common stock (the "Warrant") to Comcast pursuant to which Comcast may, subject to certain vesting provisions, purchase up to 7,816,162 shares of the Company's common stock subject to adjustment in accordance with the terms of the Warrant, for a per share exercise price of $4.76. Comcast may exercise the Warrant for cash or on a net share basis. The Warrant expires on September 26, 2023 or the prior consummation of a change of control of the Company.

Comcast's right to purchase 781,617 shares vested as of the Warrant issuance date as an incentive to enter into the software license product supply agreement. Comcast's right to purchase 1,172,425 shares vested as of July 31, 2018 upon the acceptance and completion of field trials. Comcast's right to purchase an additional 781,617 shares will vest upon Comcast's election for enterprise license pricing for the Company's CableOS software products. Such pricing would obligate Comcast to make certain total payments to the Company over the term of the product supply agreement.

Comcast's rights to purchase additional shares in specified tranches vest when Comcast exceeds specified cumulative purchase amounts from the Company under the product supply agreement and, for certain tranches, such purchases are made within specified time periods.

Table of Content

The Warrant is considered an incentive for Comcast to purchase certain of the Company's products. Therefore the value of the vested Warrant is recorded as an asset, which is recognized as a reduction in the Company's net revenues in proportion to the pertinent sales to Comcast. The Warrant is considered indexed to the Company's common stock and classified as stockholders' equity based on its terms. Accordingly, the vested Warrant amounts are included in "Additional paid-in capital".

Because the Warrants contain performance criteria, which include cumulative purchase amounts Comcast must achieve for the Warrants to vest, the final measurement date for the Warrants is the date on which the Warrants vest. Prior to the final measurement, when achievement of the performance criteria has been deemed probable, the estimated fair value of Warrants is being recorded as a reduction to the Company's net revenue based on the estimated number of Warrants expected to vest, the proportion of purchases by Comcast within the period relative to the cumulative purchase levels required for the Warrants to vest and the then-current fair value of the related Warrants. To the extent that estimate change in the future as to the number of Warrants that will vest, as well as changes in the fair market value of the Warrants, a cumulative catch-up adjustment will be recorded in the period in which the estimates change. The value of the Warrant is recorded as a reduction in the Company's net revenues to the extent such value does not exceed net revenues from pertinent sales to Comcast.

The fair value of the Warrant is determined using the Black-Scholes option pricing model. The assumptions utilized in the Black-Scholes model include the risk-free interest rate, expected volatility, and expected life in years. The risk-free interest rate is based on the U.S. Treasury yield curve rates with maturity terms similar to the expected life of the Warrant. Expected volatility is determined utilizing historical volatility over a period of time equal to the expected life of the Warrant. Expected life is equal to the remaining contractual term of the Warrant. The dividend yield is assumed to be zero since the Company has not historically declared dividends and does not have any plans to declare dividends in the future.

The portion of the Warrant which vested on September 26, 2016 had a fair value of $1.6 million. The fair value was determined using the Black-Scholes option valuation model using the following assumptions: expected term of 7 years, volatility of 42%, risk-free interest rate of 1.4%, and expected dividends of 0.0%.

On July 31, 2018, pursuant to the vesting provisions of the Warrant, an additional tranche of 1,172,425 shares vested and became exercisable upon the acceptance of completion of field trials by Comcast. The fair value of the Warrant on the date of vesting was estimated to be $2.3 million using the Black-Scholes option pricing model with the following assumptions: expected term of 5.2 years, volatility of 45%, risk-free interest rate of 2.9%, and expected dividends of 0.0%. The fair value of the Warrant was recorded as a component of "Other long-term assets" with an equal offset to "Additional paid in capital" on the Company's Consolidated Balance Sheets. The Company will amortize this asset as a reduction in the Company's net revenues in proportion to the pertinent sales to Comcast.

During the year ended December 31, 2018, 2017 and 2016, the Company recorded $1.2 million, $0.2 million and $0.4 million, respectively as a reduction to net revenues in connection with amortization of the Warrant.

NOTE 17: SEGMENT INFORMATION, GEOGRAPHIC INFORMATION AND CUSTOMER CONCENTRATION

Segment Information

Operating segments are defined as components of an enterprise that engage in business activities for which separate financial information is available and evaluated by the Company's CODM, which for the Company is its Chief Executive Officer, in deciding how to allocate resources and assess performance. Based on our internal reporting structure, the Company consists of two operating segments: Video and Cable Access. The operating segments were determined based on the nature of the products offered. The Video segment provides video processing and production and playout solutions and services worldwide to broadcast and media companies, streaming new media companies, cable operators, and satellite and telecommunications (telco) Pay-TV service providers. The Cable Access segment

provides CableOS cable access solutions and related services to cable operators globally.
On February 29, 2016, the Company completed its acquisition of 100% of the outstanding equity of TVN and assigned TVN to its Video operating segment.

The following table provides summary financial information by reportable segment (in thousands):

Table of Content

	Year ended December 31,		
	2018	2017 [1]	2016
Video			
Revenue	$313,828	$319,473	$351,489
Gross profit	178,170	173,414	194,044
Operating income (loss)	26,170	(2,024)	11,963
Cable Access			
Revenue	$89,730	$38,773	$54,422
Gross profit	39,029	8,892	21,174
Operating loss	(1,756)	(23,154)	(12,131)
Total			
Revenue	$403,558	$358,246	$405,911
Gross profit	217,199	182,306	215,218
Operating income (loss)	24,414	(25,178)	(168)

(1) The Company has historically employed an aggregate allocation methodology based on total revenues to attribute professional services revenue and sales expenses between its Video and Cable Access segments. Beginning in the fourth quarter of 2017, the Company prospectively changed to a more precise attribution methodology as the activities of selling and supporting the CableOS solution have become increasingly distinct from those of Video solutions. The impact of making this change for the fiscal year ended December 31, 2017 compared to the Company's historical approach was an increase in operating loss of $5.9 million from the Video segment and a corresponding decrease in operating loss of the Cable Access segment. The Company believes that the updated allocation methodology provides greater clarity regarding the operating metrics of the Video and Cable Access business segments.

A reconciliation of the Company's consolidated segment operating income (loss) to consolidated loss before income taxes is as follows (in thousands):

	Year ended December 31,		
	2018	2017 [1]	2016 [1]
Total segment operating income (loss)	$24,414	$(25,178)	$(168)
Unallocated corporate expenses [1]	(3,769)	(20,767)	(38,972)
Stock-based compensation	(17,289)	(16,610)	(13,060)
Amortization of intangibles	(8,367)	(8,322)	(14,836)
Consolidated loss from operations	(5,011)	(70,877)	(67,036)
Non-operating expense, net	(11,937)	(13,830)	(13,394)
Loss before income taxes	$(16,948)	$(84,707)	$(80,430)

(1) For the years ended December 31, 2017 and 2016, the unallocated corporate expenses included TVN acquisition- and integration-related costs, TVN VDP costs (see Note 10, "Restructuring and Related charges-TVN VDP," for more information on TVN VDP) and Cable Access product line inventory obsolescence costs, totaling $7.9 million and $32.2 million, respectively. In addition, in fiscal 2017, the unallocated corporate expenses included $8.0 million of Avid litigation settlement cost and associated legal fees (see Note 19, "Legal Proceedings," for more information). The remaining unallocated corporate expenses for all years presented above include primarily other restructuring charges and excess facilities charges.

Unallocated Corporate Expenses

Together with amortization of intangibles and stock-based compensation, the Company does not allocate restructuring and related charges, TVN acquisition- and integration-related costs, and certain other non-recurring charges to the operating income (loss) for each segment because management does not include this information in the measurement of the performance of the operating segments. A measure of assets by segment is not applicable as segment assets are not included in the discrete financial information provided to the CODM.

Table of Content

Geographic Information

The geographic distribution of Harmonic’s revenue and property and equipment, net is summarized in the tables below (in thousands):

	Year ended December 31,		
	2018	2017	2016
Net revenue (1):			
United States	$181,965	$131,773	$171,016
Other countries	221,593	226,473	234,895
Total	$403,558	$358,246	$405,911

(1) Revenue is attributed to countries based on the location of the customer.

Other than the U.S., no single country accounted for 10% or more of the Company’s net revenues for the years ended December 31, 2018, 2017 and 2016.

	As of December 31,	
	2018	2017
Property and equipment, net:		
United States	$10,376	$13,786
Israel	6,975	8,904
France	3,519	4,573
Other countries	1,451	2,002
Total	$22,321	$29,265

Customer Concentration

Net revenue from Comcast accounted for 15% of the Company’s total net revenue during the year ended December 31, 2018. During the years ended December 31, 2017 and 2016, no single customer accounted for more than 10% of our net revenue.

NOTE 18: COMMITMENTS AND CONTINGENCIES

Leases

The Company leases its facilities under non-cancelable operating leases which expire at various dates through June 2028. In addition, the Company leases vehicles and phones in Israel the last of which expires in 2020. Total rent expense related to these operating leases was $10.1 million, $10.2 million and $9.7 million for the years ended December 31, 2018, 2017 and 2016, respectively. Future minimum lease payments under non-cancellable operating leases at December 31, 2018, are as follows (in thousands):

	Operating Leases
Year ending December 31,	
2019	$ 13,515
2020	10,139
2021	4,088
2022	2,523
2023	2,220
Thereafter	6,694
Total minimum payments	$ 39,179

Warranty

The Company accrues for estimated warranty costs at the time of product shipment. Management periodically reviews the estimated warranty liability and records adjustments based on the terms of warranties provided to customers, historical and anticipated warranty claims experience, and estimates of the timing and cost of warranty claims. Activities for the Company’s warranty accrual for each fiscal year, which is included in accrued and other current liabilities, is summarized below (in thousands):

Table of Content

	2018	2017	2016
Balance at beginning of period	$4,381	$4,862	$3,913
Accrual for current period warranties	6,612	5,117	5,482
Balance assumed from TVN acquisition	—	—	1,012
Warranty costs incurred	(6,124)	(5,598)	(5,545)
Balance at end of period	$4,869	$4,381	$4,862

Bank Guarantees and standby Letters of Credit

As of December 31, 2018 and 2017, the Company has outstanding bank guarantees and standby letters of credit in aggregate of $2.3 million and $2.7 million, respectively, consisting of building leases and performance bonds issued to customers.

During 2017, one of the Company's subsidiaries entered into a $2.0 million credit facility with a foreign bank for the purpose of issuing performance guarantees. The credit facility is secured by a $2.2 million guarantee issued by the parent company. There were no amounts outstanding under this credit facility as of December 31, 2018 and December 31, 2017.

Indemnification

The Company is obligated to indemnify its officers and its directors pursuant to its bylaws and contractual indemnity agreements. The Company also indemnifies some of its suppliers and most of its customers for specified intellectual property matters pursuant to certain contractual arrangements, subject to certain limitations. The scope of these indemnities varies, but, in some instances, includes indemnification for damages and expenses (including reasonable attorneys' fees). There have been no amounts accrued in respect of the indemnification provisions through December 31, 2018.

Royalties

The Company has licensed certain technologies from various companies. It incorporates these technologies into its own products and is required to pay royalties for such use, usually based on shipment of the related products. In addition, the Company has obtained research and development grants under various Israeli government programs that require the payment of royalties on sales of certain products resulting from such research. Royalty expenses were $4.2 million, $5.2 million and $4.1 million for the years ended December 31, 2018, 2017 and 2016, respectively, and they are included in cost of revenue in the Company's Consolidated Statements of Operations.

Purchase Obligations

The Company relies on a limited number of contract manufacturers and suppliers to provide manufacturing services for a substantial majority of its products. The Company had approximately $35.9 million of non-cancelable commitments to purchase inventories and other commitments as of December 31, 2018.

Table of Content

NOTE 19: LEGAL PROCEEDINGS

In October 2011, Avid Technology, Inc. (“Avid”) filed a complaint in the United States District Court for the District of Delaware alleging that Harmonic’s Media Grid product infringes two patents held by Avid. A jury trial on this complaint commenced on January 23, 2014 and, on February 4, 2014, the jury returned a unanimous verdict in favor of us, rejecting Avid’s infringement allegations in their entirety. In January 2015, Avid filed an appeal with respect to the jury’s verdict with the Federal Circuit. In January 2016, the Federal Circuit issued an order vacating the verdict of noninfringement and remanding the case to the trial court for a new trial on infringement.

In June 2012, Avid served a subsequent complaint in the United States District Court for the District of Delaware alleging that the Company’s Spectrum product infringes one patent held by Avid. The complaint sought injunctive relief and unspecified damages. In September 2013, the U.S. Patent Trial and Appeal Board (“PTAB”) authorized an inter partes review to be instituted as to claims 1-16 of the patent asserted in this second complaint. In July 2014, the PTAB issued a decision finding claims 1-10 invalid and claims 11-16 not invalid. We filed an appeal with respect to the PTAB’s decision on claims 11-16 in September 2014, and the Federal Circuit affirmed the PTAB’s decision in April 2016.

In July 2017, the court issued a scheduling order consolidating both cases and setting the trial date for November 6, 2017.

On October 19, 2017, the parties agreed to settle the consolidated cases by entering into a settlement and patent portfolio cross-license agreement, and the cases were dismissed with prejudice. In connection with the agreement, the Company recorded a $6.0 million litigation settlement expense in “Selling, general and administrative expenses” in the Company’s 2017 Consolidated Statement of Operations. Of the associated $6.0 million settlement liability, $2.5 million was paid in October 2017 and the remaining $1.5 million and $2.0 million will be paid in the second quarter of 2019 and the third quarter of 2020, respectively.

From time to time, the Company is involved in lawsuits as well as subject to various legal proceedings, claims, threats of litigation, and investigations in the ordinary course of business, including claims of alleged infringement of third-party patents and other intellectual property rights, commercial, employment, and other matters. The Company assesses potential liabilities in connection with each lawsuit and threatened lawsuits and accrues an estimated loss for these loss contingencies if both of the following conditions are met: information available prior to issuance of the financial statements indicates that it is probable that a liability has been incurred at the date of the financial statements and the amount of loss can be reasonably estimated. While certain matters to which the Company is a party specify the damages claimed, such claims may not represent reasonably probable losses. Given the inherent uncertainties of litigation, the ultimate outcome of these matters cannot be predicted at this time, nor can the amount of possible loss or range of loss, if any, be reasonably estimated.

Table of Content

NOTE 20: SELECTED QUARTERLY FINANCIAL DATA
(UNAUDITED, IN THOUSANDS, EXCEPT PER SHARE AMOUNTS)

The following table sets forth our unaudited quarterly Consolidated Statement of Operations data for each of the eight quarters ended December 31, 2018. In management's opinion, the data has been prepared on the same basis as the audited Consolidated Financial Statements included in this report, and reflects all necessary adjustments, consisting only of normal recurring adjustments, necessary for a fair statement of this data.

	Fiscal 2018			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
	(In thousands, except per share amounts)			
Quarterly Data:				
Net revenue	$90,127	$ 99,160	$ 100,616	$ 113,655
Gross profit (2)	47,183	51,603	50,102	60,321
Net income (loss) (1) (3) (4)	(13,694)	(2,913)	(7,758)	3,330
Net income (loss) per share:				
Basic and diluted	$(0.16)	$ (0.03)	$(0.09)	$0.04
Shares used in per share calculations:				
Basic	83,912	85,304	86,321	86,846
Diluted	83,912	85,304	86,321	89,028

	Fiscal 2017			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
	(In thousands, except per share amounts)			
Quarterly Data:				
Net revenue	$82,943	$ 82,315	$92,014	$ 100,974
Gross profit (2)	40,408	33,815	47,025	48,572
Net loss (1) (4)	(24,027)	(31,500)	(15,583)	(11,516)
Net loss per share:				
Basic and diluted	$(0.30)	$ (0.39)	$(0.19)	$(0.14)
Shares used in per share calculations:				
Basic and diluted	79,810	80,590	81,445	82,014

(1) In 2017, the Company incurred TVN acquisition- and integration-related expenses of $2.2 million, $0.5 million, $0.1 million and $0.1 million during the first through fourth quarter of 2017. These costs consisted of acquisition-related costs which include outside legal, accounting and other professional services as well as integration-related costs which include incremental costs resulting from the TVN acquisition that are not expected to generate future benefits once the integration is fully consummated. These costs are expensed as incurred and the Company did not incur any TVN acquisition- and integration-related expenses in 2018.

(2) Gross margin decreased to 49.8% during the third quarter of 2018 compared to 52.0% during the second quarter of 2018
and increased to 53.1% during the fourth quarter primarily as a result of product mix. Gross margin decreased to 41.1% during the second quarter of 2017 compared to 48.7% during the first quarter of 2017, primarily due to lower service margins and higher inventory obsolescence charges for the Company's legacy broadcast video inventory due to reduced demand, as well as higher inventory obsolescence charge for our older Cable Edge product lines. The factors negatively impacting the gross margin during the second quarter of 2017 were mostly absent during the third quarter of 2017, and together with a more favorable product mix, the gross margin increased to 51.1% during the third quarter of 2017 compared to 41.1% during the second quarter of 2017.

(3) During the fourth quarter of 2018, the Company recorded net income primarily due to higher revenues with stronger gross margins of 53.1% coupled with reduced operating expenses as a result of our vigilant cost management.

(4) During the fourth quarter of 2018, the Company released $1.0 million of valuation allowance associated with one of Company's foreign subsidiaries. During the third and fourth quarter of 2017, the Company recorded $2.4 million of tax benefit associated with the release of tax reserves for uncertain tax positions as a result of the expiration of statute of limitations and $2.5 million of tax benefits associated with the alternative minimum tax refund related to the TCJA, respectively. These tax benefits were offset by $3.0 million tax expense recorded during the fourth quarter of 2017, related to tax law changes in one of the Company's foreign subsidiaries.

Table of Content

Item 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

Item 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We maintain “disclosure controls and procedures,” as such term is defined in Rule 13a-15(e) under the Exchange Act, that are designed to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in SEC 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 timely decisions regarding required disclosure. In designing and evaluating our disclosure controls and procedures, management recognized that disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. The design of any disclosure controls and procedures also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Based on their evaluation as of the end of the period covered by this Annual Report on Form 10-K, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures were effective.

Management’s Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act). Management conducted an assessment of the effectiveness of the Company’s internal control over financial reporting based on the criteria set forth in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on the Company’s assessment, management concluded that its internal control over financial reporting was effective as of December 31, 2018.

The Company’s independent registered public accounting firm, Armanino LLP, has audited the effectiveness of the Company’s internal control over financial reporting, as stated in their report which appears in Part II, Item 8 of this Form 10-K.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during our fourth quarter of fiscal year 2018, which were identified in connection with management’s evaluation required by paragraph (d) of rules 13a-15 and 15d-15 under the Exchange Act, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. OTHER INFORMATION

None.

PART III

Certain information required by Part III is omitted from this Annual Report on Form 10-K pursuant to Instruction G to Exchange Act Form 10-K, and the Registrant will file its definitive Proxy Statement for its 2019 Annual Meeting of Stockholders, pursuant to Regulation 14A of the Securities Exchange Act of 1934, as amended (the “2019 Proxy Statement”), not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K, and certain information included in the 2019 Proxy Statement is incorporated herein by reference.

Table of Content

Item 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item will be set forth in the 2019 Proxy Statement and is incorporated herein by reference.

Harmonic has adopted a Code of Business Conduct and Ethics (the “Code”) that applies to all employees, including Harmonic’s Chief Executive Officer, Chief Financial Officer and Corporate Controller. The Code is available on the Company’s website at www.harmonicinc.com.

Harmonic intends to satisfy the disclosure requirement under Form 8-K regarding an amendment to, or waiver from, a provision of this Code of Ethics by posting such information on our website, at the address specified above, and, to the extent required by the listing standards of The NASDAQ Global Select Market, by filing a Current Report on Form 8-K with the Securities and Exchange Commission disclosing such information.

Item 11. EXECUTIVE COMPENSATION

The information required by this item will be set forth in the 2019 Proxy Statement and is incorporated herein by reference.

Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Information related to security ownership of certain beneficial owners and security ownership of management and related stockholder matters will be set forth in the 2019 Proxy Statement and is incorporated herein by reference.

Item 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item will be set forth in the 2019 Proxy Statement and is incorporated herein by reference.

Item 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item will be set forth in the 2019 Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

1. Financial Statements. See Index to Consolidated Financial Statements in Item 8 on page of this Annual Report on Form 10-K.
2. Financial Statement Schedules. Financial statement schedules have been omitted because the information is not required to be set forth herein, is not applicable or is included in the financial statements or the notes thereto.
3. Exhibits. The documents listed in the Exhibit Index of this Annual Report on Form 10-K are filed herewith or are incorporated by reference in this Annual Report on Form 10-K, in each case as indicated therein.

Table of Content

Exhibit Number	Description
3.1(ii)	Certificate of Incorporation of Harmonic Inc., as amended
3.2 (xv)	Amended and Restated Bylaws of Harmonic Inc.
4.1(i)	Form of Common Stock Certificate
4.2(iii)	Certificate of Designation of Rights, Preferences and Privileges of Series A Participating Preferred Stock of Harmonic Inc.
4.3(viii)	Indenture, dated December 14, 2015, by and between the Company and U.S. Bank National Association
4.4(vii)	Form of 4.00% Senior Convertible Note due 2020 (included in Exhibit 4.3)
4.5(x)†	Warrant to Purchase Shares of Common Stock of Harmonic, Inc.
10.1(i)*	Form of Indemnification Agreement
10.2(vii)*	1995 Stock Plan, as amended and restated on June 13, 2017
10.3(xiv)*	2002 Director Stock Plan, as amended and restated on June 13, 2017
10.4(xiv)*	2002 Employee Stock Purchase Plan, as amended and restated on June 13, 2017
10.5(xiii)*	Amended and Restated Change of Control Severance Agreement between Harmonic Inc. and Patrick Harshman, effective March 20, 2018
10.6(xiii)*	Form of Amended and Restated Change of Control Severance Agreement between Harmonic Inc. and each of Sanjay Kalra, Nimrod Ben-Natan, Neven Haltmayer, Eric Louvet and Tim Warren, effective March 20, 2018
10.8(vii)*	Harmonic Inc. 2002 Director Stock Plan Restricted Stock Unit Agreement
10.9(iv)	Professional Service Agreement between Harmonic Inc. and Plexus Services Corp., dated September 22, 2003
10.10(iv)	Amendment, dated January 6, 2006, to the Professional Services Agreement for Manufacturing between Harmonic Inc. and Plexus Services Corp., dated September 22, 2003
10.11(iv)	Addendum 1, dated November 26, 2007, to the Professional Services Agreement between Harmonic Inc. and Plexus Services Corp., dated September 22, 2003
10.12 (xii)	Harmonic Inc. 1995 Stock Plan Restricted Stock Unit Agreement
10.13(v)	Lease Agreement between Harmonic Inc. and CRP North First Street, L.L.C. dated December 15, 2009

10.15(vi)*	Amended and Restated Loan and Security Agreement, dated as of December 18, 2017, by and among Harmonic Inc., Harmonic International AG and Silicon Valley Bank
10.16(xi)	Put Option Agreement, dated as of December 7, 2015, by and between Harmonic Inc. and Mr. Eric Louvet, Mr. Eric Gallier, Mr. Jean-Marc Guiot, Mr. Claude Perron, Mrs. Crystele Trévisan-Jallu, Mrs. Delphine Sauvion, Mr. Marc Procureur, Mr. Christophe Delahousse, Mr. Hervé Congard, Mr. Arnaud de Puyfontaine, FPCI Winch Capital 3, Montalivet Networks and FPCI CIC Mezzanine 3
10.18(xi)	Sale and Purchase Agreement, dated as of February 11, 2016, by and between Harmonic International AG and Mr. Eric Louvet, Mr. Eric Gallier, Mr. Jean-Marc Guiot, Mr. Claude Perron, Mrs. Crystele Trévisan-Jallu, Mrs. Delphine Sauvion, Mr. Marc Procureur, Mr. Christophe Delahousse, Mr. Hervé Congard, Mr. Arnaud de Puyfontaine, FPCI Winch Capital 3, Montalivet Networks and FPCI CIC Mezzanine 3 for the acquisition of Thomson Video Networks
10.19(x)	Registration Rights Agreement, dated September 26, 2016, by and between the Company and Comcast.
21.1	Subsidiaries of Harmonic Inc.
23.1	Consent of Independent Registered Public Accounting Firm
23.2	Consent of PricewaterhouseCoopers LLP - Independent Registered Public Accounting Firm
31.1	Certification of Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

Table of Content

31.2 Certification of Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

32.1 Certification of Principal Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

32.2 Certification of Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

101 The following materials from Registrant’s Annual Report on Form 10-K for the year ended December 31, 2018, formatted in Extensible Business Reporting Language (XBRL) includes: Consolidated Balance Sheets at December 31, 2018 and December 31, 2017; (ii) Consolidated Statements of Operations for the Years Ended December 31, 2018, December 31, 2017 and December 31, 2016; (iii) Consolidated Statements of Comprehensive Loss for the Years Ended December 31, 2018, December 31, 2017 and December 31, 2016; (iv) Consolidated Statements of Stockholders’ Equity for the Years Ended December 31, 2018, December 31, 2017 and December 31, 2016; (v) Consolidated Statements of Cash Flows for the Years Ended December 31, 2018, December 31, 2017 and December 31, 2016; and (vi) Notes to Consolidated Financial Statements.

* Indicates a management contract or compensatory plan or arrangement relating to executive officers or directors of the Company.

† Registrant has omitted portions of this exhibit and filed such exhibit separately with the Securities and Exchange Commission pursuant to a grant of confidential treatment under Rule 406 promulgated under the Securities Act.

(i) Previously filed as an Exhibit to the Company’s Registration Statement on Form S-1 No. 33-90752.

(ii) Previously filed as an Exhibit to the Company’s Annual Report on Form 10-K for the year ended December 31, 2001.

(iii) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated July 25, 2002.

(iv) Previously filed as an Exhibit to the Company’s Current Annual Report on Form 10-K for the year ended December 31, 2008.

(v) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated December 18, 2009.

(vi) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated December 21, 2017.

(vii) Previously filed as an Exhibit to the Company’s Registration Statement on Form S-8, dated June 22, 2017.

(xiii) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated December 14, 2015.

(ix) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated September 26, 2016.

(x) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated September 26, 2016.

(xi) Previously filed as an Exhibit to the Company’s Annual Report on Form 10-K for the year ended December 31, 2016.

(xii) Previously filed as an Exhibit to the Company’s Annual Report on Form 10-K for the year ended December 31, 2017.

(xiii) Previously filed as an Exhibit to the Company’s Current Report on Form 8-K dated March 26, 2018.

(xiv) Previously filed as an Exhibit to the Company’ Registration Statement on Form S-8, dated June 25, 2018.

(xv) Previously filed as an exhibit to the Company’s Periodic Report on Form 10-Q, dated November 5, 2018.

Item 16. FORM 10-K SUMMARY

None.

Table of Content

SIGNATURES

Pursuant to the requirements of Section 13 or 15 (d) of the Securities Exchange Act of 1934, the Registrant, Harmonic Inc., a Delaware corporation, has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Jose, State of California, on March 1, 2019.

HARMONIC INC.

By: /s/ PATRICK J. HARSHMAN
Patrick J. Harshman
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ PATRICK J. HARSHMAN (Patrick J. Harshman)	President & Chief Executive Officer (Principal Executive Officer)	March 1, 2019
/s/ SANJAY KALRA (Sanjay Kalra)	Chief Financial Officer (Principal Financial and Accounting Officer)	March 1, 2019
/s/ PATRICK GALLAGHER (Patrick Gallagher)	Chairman	March 1, 2019
/s/ E. FLOYD KVAMME (E. Floyd Kvamme)	Director	March 1, 2019
/s/ SUSAN G. SWENSON (Susan G. Swenson)	Director	March 1, 2019
/s/ MITZI REAUGH (Mitzi Reaugh)	Director	March 1, 2019
/s/ NIKOS THEODOSOPOULOS (Nikos Theodosopoulos)	Director	March 1, 2019
/s/ DAVID KRALL (David Krall)	Director	March 1, 2019
/s/ DEBORAH L. CLIFFORD (Deborah L. Clifford)	Director	March 1, 2019