UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2020

OR

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

Commission File Number: 001-39304

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

Delaware	**84-4734590**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**
3025 Orchard Parkway, San Jose, California	**95134**
(Address of Principal Executive Offices)	**(Zip Code)**

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

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.001 per share	XPER	The Nasdaq Global Select Market

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

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

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Securities Exchange Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

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

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

Indicate by check mark whether the Registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

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

The aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of June 30, 2020 was $976,687,119 (based on the closing sale price of the registrant's common stock as reported on The Nasdaq Global Select Market).

The number of shares outstanding of the registrant's common stock as of February 8, 2021 was 104,791,729.

DOCUMENTS INCORPORATED BY REFERENCE:

Portions of the registrant's Proxy Statement for the registrant's 2021 Annual Meeting of Stockholders will be filed with the Commission within 120 days after the close of the registrant's 2020 fiscal year and are incorporated by reference in Part III of this Annual Report on Form 10-K to the extent stated herein.

XPERI HOLDING CORPORATION

ANNUAL REPORT ON FORM 10-K

FOR THE YEAR ENDED DECEMBER 31, 2020

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Cautionary Statement Regarding Forward-Looking Statements

This annual report on Form 10-K (this "Annual Report") contains forward-looking statements, which are subject to the safe harbor provisions created by the Private Securities Litigation Reform Act of 1995. Words such as "expects," "anticipates," "plans," "believes," "seeks," "estimates," "could," "would," "may," "intends," "targets" and similar expressions or variations of such words are intended to identify forward-looking statements, but are not the exclusive means of identifying forward-looking statements in this Annual Report. The identification of certain statements as "forward-looking" is not intended to mean that other statements not specifically identified are not forward-looking. All statements other than statements about historical facts are statements that could be deemed forward-looking statements, including, but not limited to, statements that relate to our future revenue, product development, demand, acceptance and market share, growth rate, competitiveness, gross margins, levels of research, development and other related costs, expenditures, the outcome or effects of and expenses related to litigation and administrative proceedings related to our patents, our planned separation of two business segments, our intent to enforce our intellectual property rights, our ability to license our intellectual property, tax expenses, cash flows, our ability to liquidate and recover the carrying value of our investments, our management's plans and objectives for our current and future operations, our plans for quarterly dividends and stock repurchases, the levels of customer spending or research and development activities, general economic conditions, and the sufficiency of financial resources to support future operations and capital expenditures.

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

PART I

Item 1. Business

Corporate Information

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

Overview

On December 18, 2019, Xperi Corporation ("Xperi") entered into a definitive agreement with TiVo Corporation ("TiVo"), to combine in an all-stock merger of equals transaction (the "Mergers"). Following consummation of the Mergers on June 1, 2020, Xperi Holding Corporation became the parent company of both Xperi and TiVo. The common stock of both Xperi and TiVo were de-registered after completion of the Mergers. On June 2, 2020, Xperi Holding Corporation's common stock, par value $0.001 per share, commenced trading on the Nasdaq Global Select Market ("Nasdaq") under the ticker symbol "XPER." Xperi was determined to be the accounting acquirer in the Mergers. As a result, the historical financial statements of Xperi for periods prior to the Mergers are considered to be the historical financial statements of Xperi Holding Corporation. As used herein, the "Company," "we," "us" and "our" refer to Xperi when referring to periods prior to June 1, 2020 and Xperi Holding Corporation when referring to periods subsequent to June 1, 2020. Our results of operations include the operations of TiVo after June 1, 2020. Unless specified otherwise, the financial results in this Annual Report are those of the Company and its subsidiaries on a consolidated basis. For further discussion on the Mergers, refer to "Item 1A. Risk Factors," and "Note 9 – Business Combination" in the Notes to Consolidated Financial Statements.

We are a leading consumer and entertainment product/solutions licensing company and one of the industry's largest intellectual property licensing platforms, with a diverse portfolio of media and semiconductor intellectual property and more than 11,000 patents and patent applications worldwide. We invent, develop, and deliver technologies that enable extraordinary experiences. Xperi technologies, delivered via our brands (DTS, HD Radio, IMAX Enhanced, Invensas, TiVo), and by our subsidiary, Perceive Corporation ("Perceive"), make entertainment more entertaining, and smart devices smarter. Our technologies are integrated into billions of consumer devices, media platforms, and semiconductors worldwide, driving increased value for partners, customers and consumers. We shape how millions of consumers access and experience entertainment content, and our innovations are found in billions of devices and hundreds of millions of interfaces around the globe. Headquartered in Silicon Valley with operations around the world, we have approximately 1,850 employees and over 30 years of operating experience.

Following the Mergers, we determined that we conduct our business in two operating segments: (1) Product and (2) Intellectual Property ("IP") Licensing. The Product segment consists primarily of licensing our internally-developed audio, digital radio, imaging, edge-based machine learning and multi-channel video user experience ("UX") solutions. Audio, digital radio, imaging solutions and edge-based machine learning include the delivery of software and/or hardware-based solutions to our consumer electronics ("CE") customers, automotive manufacturers or their supply chain partners. UX products and services revenue is primarily derived from multi-channel video service providers and CE manufacturers, licensing the TiVo service and selling TiVo-enabled devices like the Stream 4K, Personalized Content Discovery, enriched Metadata, viewership data and advertising.

The IP Licensing segment consists primarily of licensing our innovations to leading companies in the media and semiconductor industries. Licensing arrangements include access to one or more of our foundational patent portfolios and may also include access to some of our industry-leading technologies and proven know-how. In media, our licensees include multichannel video programming distributors ("MVPDs"), over-the-top ("OTT") video service providers, consumer electronics manufacturers, social media and other new media companies. In semiconductor, our licensees include memory, sensors, RF component, and foundry companies.

We are currently contemplating and may pursue, subject to any required regulatory approvals, a separation of our product business and IP Licensing business through a tax-efficient transaction, resulting in two independent, publicly traded companies. We are evaluating the optimal timing of the contemplated business separation and currently anticipate that such separation will not be completed earlier than the first half of 2022.

Impact of COVID-19 Pandemic

Please refer to the Executive Summary section of Part II, Item 7 “Management's Discussion and Analysis of Financial Condition and Results of Operations” for information concerning the continuing effect of COVID-19 on our business.

Product Segment

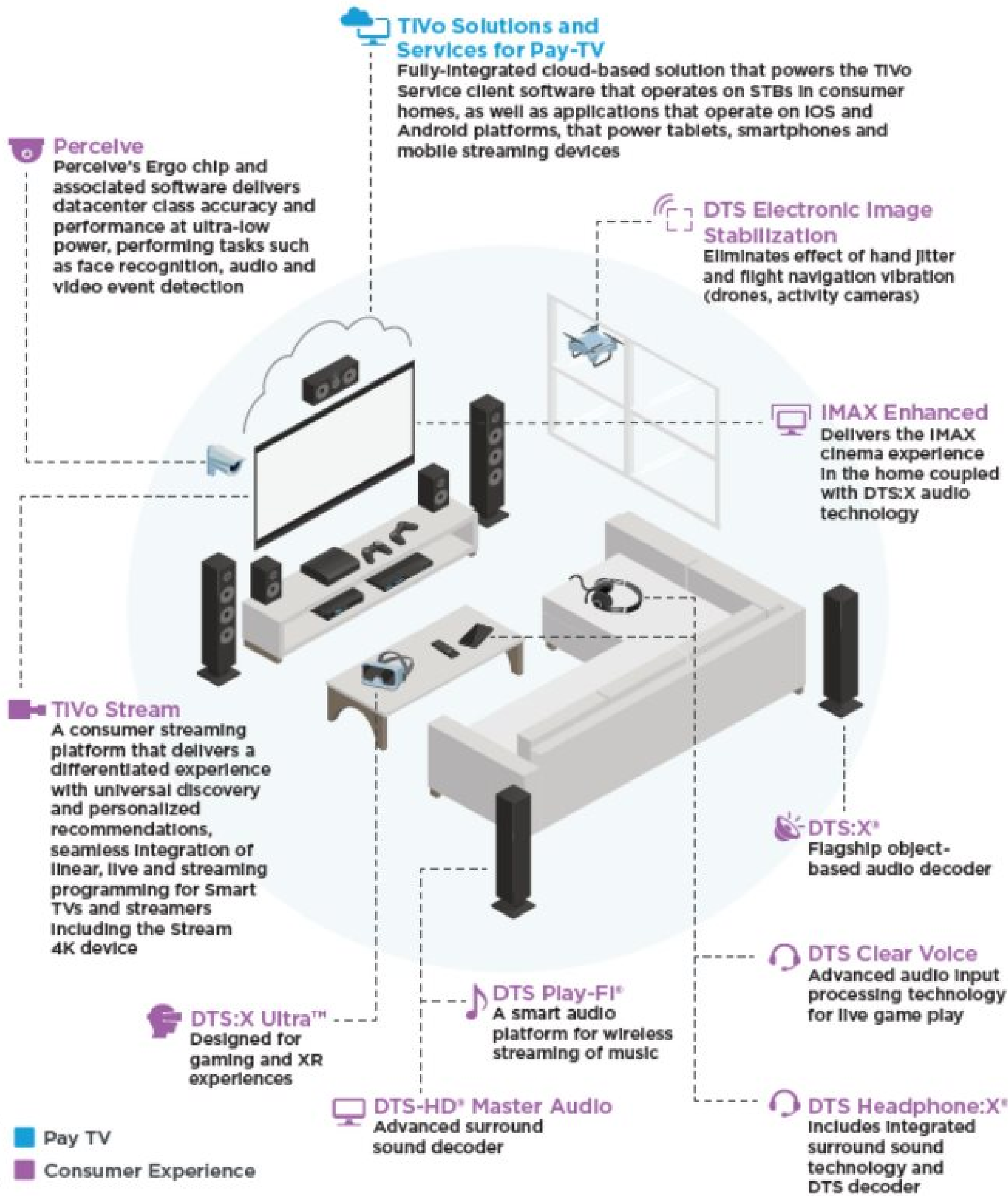
Our product business comprises a portfolio of software and services that address one of the biggest consumer trends in entertainment today – the massive proliferation of content and the rapidly changing habits for how consumers are finding, watching and enjoying entertainment. We offer consumers a unique and seamless end-to-end entertainment experience: from choice to consumption - in the home, in the car and on-the-go. Additionally, through our technology solutions, we can offer our customers and partners additional ways to monetize that consumption. We group our Product business into three categories based on the products delivered and customers served: Consumer Experience, Connected Car, and Pay-TV.

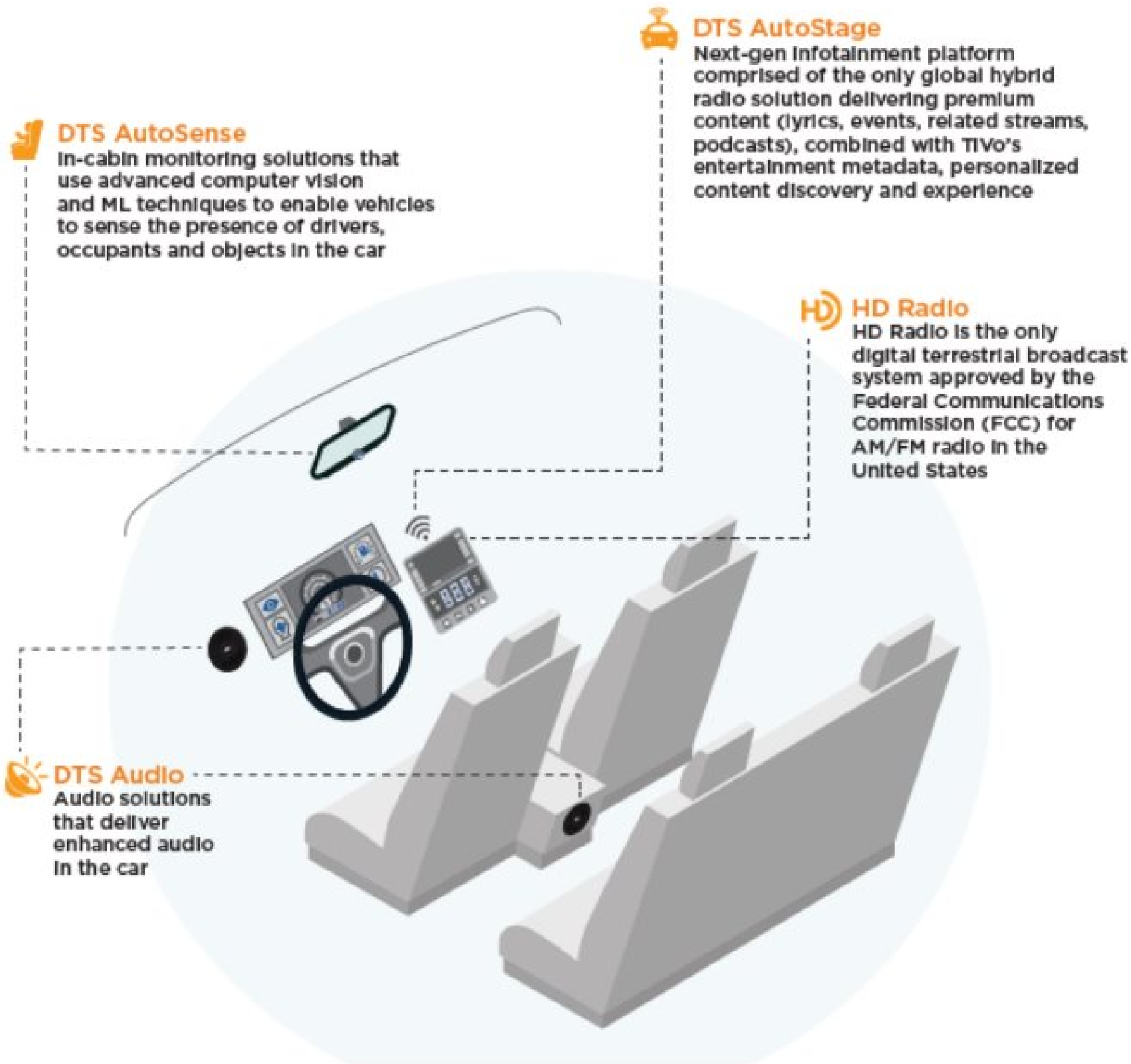
Strategy

Our goal is to make entertainment more entertaining and smart devices smarter. We do this through developing ground-breaking innovations that enhance the products and services that billions of consumers interact with on a daily basis. Our inventions are focused on driving increased value for partners, customer, and consumers across multiple end-markets. Key elements of our strategy by end-market include:

- Consumer Experience: Enhancing consumers’ discovery and consumption of entertainment content, whether it be in the home or on the go, through our audio, imaging, and media solutions.
- Connected Car: Delivering unique entertainment experiences as well as ground-breaking safety solutions for automotive markets worldwide.
- Pay-TV: Transforming the traditional television user experience from linear / video-on-demand (“VOD”) to a modern content discovery platform that breaks down content silos and boundaries, creating a unified media experience that enables unprecedented end user engagement.
- In addition to the above end markets we are also focused on delivering a new machine learning-based hardware and software platform in form of small power-efficient AI semiconductor chip branded Ergo™. The Ergo platform combines work on advanced machine learning with our unique experience in imaging, audio, and semiconductor technologies. Our focus is on delivering on a solution that enables data center quality inference to edge devices to an addressable market of billions of devices across IoT, in home, mobile and automotive applications.

Consumer Experience and Pay TV Solutions





Consumer Experience

Our Consumer Experience business represents four major product groups based on the solutions delivered to our customers: TiVo Software and Services, Audio, Imaging and Edge-Based Machine Learning. Below are some of the key solutions we license:

TiVo Software & Services

TiVo Stream. Our TiVo Stream platform is a consumer streaming platform that empowers consumers to confidently navigate an increasingly fragmented and complex entertainment landscape, bringing content of all formats, including movies, TV and user generated video, into a single experience with more end user customization to control their entertainment bundles. It

represents a differentiated experience with universal discovery and personalized recommendations with seamless integration of linear, live and streaming programming.

TiVo Stream is a platform with multiple go-to-market endpoints such as the TiVo Stream 4K device addressing the fast-growing streaming media player market, and TiVo Stream embedded as an operating platform on Smart TVs and other consumer electronic products. We sell TiVo Stream 4K both direct to consumers as well as via online and traditional retail channels. The TiVo Stream platform is licensed as a software-as-a-service to consumer electronic and TV OEMs giving us the right to monetize all or part of the end user content engagement over the life of the product.

Metadata. Our metadata products are a critical component of delivering an interactive entertainment experience. We offer the industry's most comprehensive metadata library covering television, sports, movies, digital-first, music, celebrities, books, and video games. We develop our metadata through a technology platform that combines machine learning techniques and platform-mediated work with our proprietary and patented knowledge graph technology. Our focus on quality, robustness and consistent international depth has made us a recognized leader in entertainment metadata services worldwide.

We offer several metadata and service offerings, including, but not limited to, schedules, listings and web content linking services. Customers typically pay us a monthly or quarterly licensing fee for the rights to use the metadata, including regular updates, and to integrate it into their own service. Our metadata can be sold stand-alone or as a complement to another TiVo product such as a TiVo Stream or search and recommendation solution. We deliver metadata using real-time APIs and as bulk data files depending on our customer's requirements. Our metadata customers include leading global companies such as Microsoft Corporation ("Microsoft") and Samsung Electronics Co. Ltd. ("Samsung").

Personalized Content Discovery and Natural Language Voice. Personalized Content Discovery with conversation services provides service providers, CE device manufacturers and application/service developers a way to enable their customers to quickly find, discover and access content across linear broadcast television, VOD, DVR, and OTT sources. The ongoing investment in our Personalized Content Discovery platform enables us to provide some of the most advanced capabilities in media personalization, prediction and voice search. The advanced algorithms of our technology understand the nature and relationship of content information and the context surrounding a user's behavior to deliver an advanced personalized content discovery experience. Results can be generated through traditional text entry, voice interaction or our content recommendations. Our natural language voice solution, when combined with our advanced search and recommendations technology, enables a conversational interaction between a viewer and their content experience.

These technologies can be applied to pay TV, internet TV, and video services from virtual service providers, content producers, and CE manufacturers. Customers typically pay us a per-subscriber or per-device fee. Our search and recommendation solutions are widely deployed with many leading pay TV service providers including Charter and Verizon Communications, Inc. ("Verizon").

Advanced Media and Advertising. Our Advanced Media and Advertising solutions enable pay TV and virtual service providers, content and new media companies, and advertisers and their agencies to better understand and monetize consumer media engagement. We are leading the industry to use advanced technologies focused on television data to create efficiencies and value multipliers in the evolving television advertising ecosystem. Our TV data platform processes the raw TV viewership events from millions of set-top boxes ("STBs") which our customers can anonymously match against billing, customer and a range of other third-party data.

We provide advertisers with nationwide or regionally targeted advertising on our UX Solutions. Advertisers place ads in a variety of display formats in both traditional linear television and digital advertising for internet delivered content, seamlessly incorporated into the user interface. Advertisements can trigger a variety of actions when selected via a remote control, including video advertisement playback, DVR recordings, and direct response. Utilizing our Personalized Content Discovery platform, we also target content promotions as 'paid search' by directly including the sponsored content in user interface's recommended content carousel. We work with service providers bundling their non-TiVo advertising inventory with our native inventory giving us a more significant national footprint.

Our TV Viewership Data platform processes millions of households of TV viewership data with program airings data. Our platform enables us to partner with service providers to unlock the value of their return-path data, transforming raw return-path data into meaningful viewership information to inform and support advertising, promotion and marketing initiatives. Utilizing our TV Viewership Data, MVPDs, broadcasters, content producers, advertising agencies and advertisers can activate subscribers' TV viewership alone or in combination with third-party data sources using industry- leading data safe havens to target directly, or through third party viewer segments, promotions and advertising to monetize their subscriber customer base.

We also offer a software-as-a-service Audience Insights solution used by service providers to analyze the habits and preferences of TV subscribers, providing critical insights that can be utilized to increase operational efficiency, improve customer engagement, support carriage and bundling decisions, help mitigate churn and maximize average revenue per user. Integrated with our Personalized Content Discovery solutions, Audience Insights processes millions of households of TV viewership data, programming data, billing and customer attributes data, as well as third-party sources providing service providers deep analysis of their subscriber's second-by-second engagement and consumption of content.

Audio

Audio Solutions consists of premier audio technology for high definition entertainment experiences. The DTS codec is designed to enable recording, delivery and playback of immersive high definition audio and is incorporated by hundreds of customers around the world into an array of consumer electronics devices for use anywhere, at home, in the car, or on the go. We provide products and services to entertainment media ecosystem partners such as motion picture studios, radio and TV broadcasters, game developers and other content creators to facilitate the inclusion of compelling, realistic DTS-encoded audio within their content. This in turn allows consumers to experience immersive and compelling audio wherever they choose to enjoy it. Devices that incorporate DTS audio codec technology include televisions (TVs), personal computers (PCs), smartphones, tablets, automotive entertainment systems, set top boxes (STBs), video game consoles, Blu-ray Disc players, audio/video receivers (AVRs), soundbars, wireless speakers and home theater systems. We also offer DTS post-processing audio solutions designed to enhance the entertainment experience for users of consumer electronics devices, particularly those subject to the physical limitations of smaller speakers, such as TVs, PCs and mobile devices. In 2018, we launched the IMAX Enhanced program, which Xperi manages and licenses to CE customers worldwide to deliver the ultimate home cinema experience with unique IMAX cinematic content that leverages the DTS:X audio format to flawlessly deliver signature IMAX audio mixes. In addition, our DTS PlayFi technology leverages our audio and technology expertise to enable a variety of high-quality audio playback options across wireless speakers, set top boxes, TVs and mobile devices.

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

Our immersive audio solutions, such as DTS-HD and DTS:X, empower content creators and are supported by all major Hollywood studios, many cinema operators in the U.S. and Asia, and leading streaming service providers in the U.S., Europe and Asia. We have licensed our audio technologies and related trademarks to substantially all of the major consumer electronics product manufacturers worldwide. These customers include Denso, Harman, Hisense, LG, Microsoft, Panasonic, Samsung, Sony, and others.

Imaging

Imaging Solutions: We are a pioneer in computer vision and computational imaging solutions and we provide critical imaging technologies that enable millions of consumers to take incredible pictures with their cameras and smartphones. Our FotoNation imaging products were rebranded to DTS in January 2020. These technologies underpin many of the features today's digital users enjoy every day such as advanced portrait modes, face detection and tracking, and automatic effects such as face beautification. Our imaging technologies have become must-have capabilities for certain mobile device manufacturers and have been foundational to enabling our automotive in-cabin monitoring solutions that are part of our Connected Car product group.

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

Audio and Imaging Product-Delivery. Traditionally, our technologies are delivered as software code on integrated circuit (IC) chips. We license a defined and limited set of rights to incorporate our technology into these IC chips, and the IC manufacturers deliver these Xperi-enabled chips to our customers, the consumer electronics product manufacturers. We also work closely with the world's leading IC manufacturers to enable support for our technologies on the new programmable architectures that fuel innovation and flexibility in today's consumer electronics products. Our partners specialize in key vertical markets and work closely with us to enable our latest technologies for these programmable parts. Together, we license these solutions to Xperi's consumer electronics products customers.

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

Edge-Based Machine Learning

Our Perceive subsidiary provides silicon and software solutions for edge inference, which provides two differentiating factors: low power and high performance. Perceive's Ergo chip and associated software deliver breakthrough innovation – delivering datacenter class accuracy and performance at ultra-low power, performing tasks such as face recognition, audio and video event detection. These solutions are expected to have initial market applications in consumer security cameras, doorbells, and other battery powered consumer devices, made by industry leaders.

Connected Car

We group our Connected Car business into three categories based on the products delivered to our customers: HD Radio, Automotive Connected Media and In-Cabin Monitoring Solutions.

***HD Radio*.** HD Radio is the only digital terrestrial broadcast system approved by the Federal Communications Commission (FCC) for AM/FM radio in the U.S., offering additional channels, crystal-clear sound and advanced data services with no subscription fees. HD Radio enables a high quality in-vehicle radio experience with innovative features and digital capabilities such as real time traffic and weather updates.

HD Radio technology enables digital AM/FM broadcast radio, creating significant benefits to all participants in the radio broadcasting ecosystem. HD Radio is supported by more than 2,300 radio stations, including 98 of the top 100 stations in the top 10 U.S. radio markets. Furthermore, we believe HD Radio provides compelling advantages to consumers over traditional radio as listeners enjoy upgraded audio quality, expanded content choices, and new digital services.

Our HD Radio technology is incorporated into a number of our automotive partners' products, including vehicles from Acura, Audi, BMW, Ford, GM, Honda, Hyundai, Tesla, and Toyota, among many others.

Automotive Connected Media (ACM). ACM delivers DTS AutoStage, industry leading TiVo music and audio entertainment metadata, media search and discovery and our DTS premium audio solutions into a comprehensive automotive infotainment offering. DTS AutoStage is a global system that enables car makers to utilize a single platform to deliver an enhanced radio experience across different analog and digital broadcast systems deployed regionally. Utilizing an internet protocol connection installed in a vehicle, DTS AutoStage delivers an innovative analog AM/FM and digital (DAB and HD Radio) experience by pairing broadcast programming with internet protocol-delivered content. Daimler launched the first series of automobiles featuring the DTS AutoStage platform in September 2020.

In-Cabin Monitoring (ICM). Built upon our legacy as a pioneer in computer vision and computational imaging solutions, DTS AutoSense, includes driver monitoring systems (DMS) and occupant monitoring systems (OMS) to enable a full suite of detection and analysis products for automakers. These technologies enable state-of-the-art attentiveness assessment and fatigue detection for the driver as well as in-cabin monitoring and customization options, based on occupant detection and analysis.

Pay-TV

Our Pay-TV business delivers a range of User Experience (UX) solutions under the iGuide, Passport, TiVo, G-Guide and Cubi brands servicing multi-channel video operators world-wide.

UX Solutions. We are addressing the evolving user experience around TV content consumption and creating a truly unified media experience. We are integrating virtual channels of internet delivered video directly into the consumer's primary video consumption platform to provide universal search, discovery and consumption regardless of where the content originates. Our UX Solutions allow service providers to customize certain elements of the interactive programming guides (IPGs) for their customers and to upgrade the programming features and services they offer. Our UX Solutions provide content producers with a platform for merchandising their content. Our UX Solutions allow viewers to build their own entertainment bundle to truly personalize their experience with current and future program information and are compatible with service providers' subscription management, pay-per-view ("PPV") and VOD services. We also offer operational support, professional services and content metadata. Our UX Solutions also have the ability to include advertising, and we typically share a portion of the advertising revenue from the service provider. We currently offer UX Solutions marketed to service providers under the TiVo, iGuide and Passport brands in the U.S., Canada and Latin America. Service providers generally pay us a monthly per subscriber fee to license our UX Solutions. We also offer UX Solutions to the CE industry under the G-GUIDE brand in Japan.

***TiVo Service*.** The TiVo Service is our most advanced platform, offering a fully-integrated cloud-based solution that powers the TiVo Service client software that operates on STBs in consumer homes, as well as applications that operate on third party software platforms, such as iOS and Android, that power tablets, smartphones and mobile streaming devices. The solution

supports multiple services and applications, such as linear TV programming, broadband OTT video content, digital music, photos and other media experiences. The cloud-based service manages interaction with the TiVo Service infrastructure, automatically connecting TiVo-enabled devices to provide program guide data, content recommendations, media promotion, advertising, broadband content and client software upgrades. We have enabled the TiVo Service client software to operate on STBs, such as those from CommScope Holding Company, Inc. and Technicolor SA, as well as, Android TV™ boxes and streamers from a variety of manufacturers, for deployment in MVPD networks. We also enable a full suite of cloud-based internet-protocol television ("IPTV") solutions, including internet protocol linear, VOD, start-over, catch-up and network DVR. We allow pay TV operators the flexibility to transition to IPTV while utilizing their current infrastructure to take advantage of internet video and OTT content. This solution allows the STB to operate as an ultra HD STB and a multi-room client STB. Over the past few years, the TiVo Service client software has undergone a significant refactoring. In addition to developing a new look and feel, our next generation TiVo Service platform integrates all of our most advanced technologies and solutions, including advanced cross-platform conversational voice search, personalized recommendations, predictions and insights, extensive video metadata, robust data collection and new back office capabilities, and allows our hardware partners' devices to connect with third-party consumer devices and services to enable existing and future functionality.

We also offer a direct-to-consumer retail TiVo Service in North America, to consumers who purchase TiVo DVRs and companion TiVo Mini whole-home devices. For our direct-to-consumer retail TiVo Service, consumers either pay us recurring service fees, or in some cases pay a one-time upfront fee for access to the TiVo Service for the life of the purchased TiVo DVR. We outsource the manufacturing and hardware designs to a strategic partner. The TiVo Service Platform includes a modular front-end that allows the basic platform to be used by hardware manufacturers to build STBs that support digital and analog broadcast, cable, internet TV, OTT and VOD services. We continue to advance the TiVo Service client software to operate across a variety of hardware platforms.

UX Business Operations and Technical Support. Our UX Business has technical support and certification operations to support our products:

- We provide training, technical support and integration services to pay TV service providers who license our products.
- We operate the internet-based services required for our service offerings including data delivery, search, recommendation, advertising, device management and media recognition.
- We provide broadcast delivery of television programming data and advertising to UXs on TVs and STBs in major European markets and in Japan. In North America, we deliver similar programming and advertising data via the internet.
- We support our customers with porting and engineering services to ensure our IPGs and DVRs operate properly.
- We provide customer care for UX and DVR customers to resolve data, advertising and consumer functional issues.

Competition

Consumer Experience

The TiVo Stream competes against products with on-demand OTT streaming capabilities offered by internet CE manufacturers. For example, many CE manufacturers have television or internet-enabled streaming devices for accessing video over the internet such as Apple TV, Amazon Fire TV, Google Chromecast, and Roku.

Metadata. In metadata, we compete with other providers of entertainment-related content metadata such as Gracenote (a subsidiary of Nielsen Holdings plc) and Ericsson Group's Red Bee Media, as well as a number of local metadata providers. While we do not believe that our competitors' metadata sets offer the same comprehensive breadth of focus on media exploration, discovery, and management in as many regions of the world as we do, they present competition to our metadata business for each of their areas of focus.

TV Audience Data. We collect and analyze audience research data in an area where companies such as comScore, Inc. and Nielsen Holdings plc and other online data analytics companies compete for research spend from advertisers, advertising agencies and television networks. Other large companies are also focusing resources in this area including Comcast, Facebook, Inc. and Alphabet, Inc.'s Google business. Many of our existing customers are investing in significant platforms to enable their businesses with these capabilities. We believe that there is a significant opportunity for us as an independent data and technology provider, with proprietary access to critical data assets associated with consumers' engagement with entertainment media.

Audio and Imaging. Our audio and imaging licensing products face competition from other third-party providers of similar solutions as well as internal engineering and design groups among industry IC provider and consumer electronics manufacturers.

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

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

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

Connected Car

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

Our in-cabin monitoring technologies broadly compete with other image processing software vendors targeting the automotive industry such as SmartEye and Seeing Machines, as well as engineering and design groups of tier one automotive suppliers that seek to provide similar technologies by employing different approaches with their internal teams.

Pay-TV

There are a number of companies that produce and market advanced media solutions such as UXs, IPGs, DVRs, search, recommendation, natural language voice, metadata, and advanced data and analytics in the various formats which compete, or we believe will compete, with our products and services over time. Principal competitive factors include brand recognition and awareness, product and service functionality, innovation, ease of use, personalization, content access and availability, mobility and pricing. While we are competitive across this range of factors, we believe our primary competitive differentiation includes our ability to integrate all of our products to create unique value to our customers and the depth and breadth of our IP portfolio.

Our Platform Solutions face competition from companies such as Synamedia, MediaKind, Kudelski, SA, MobiTV, Inc., Enghouse Systems Limited, and from multiple system operators ("MSOs") developed solutions such as Comcast X1 and Liberty Global plc's Horizon Media, which have created competing products that provide user interface software for use on STBs and CE and mobile devices. Such companies may offer more economically attractive agreements to service providers and CE manufacturers by bundling multiple products together. Another common competitor we encounter for our Pay-TV product offerings is a customer who chooses to build its own IPG and DVR solution. While we believe that we provide a strong alternative to "do-it-yourself," as we have innovative, high-quality products ready to be implemented, with local and network DVR, integrated data distribution infrastructure and content, as well as third party services (such as VOD services), certain customers have moved to their own internal solutions. We differentiate our products by continuing to integrate our broad portfolio of products into a suite of solutions and services for our customers. We believe our solutions can speed our customers' time to market, can be deployed at a lower cost than internally-built products, and can be superior to "do-it-yourself" products.

Over time, we expect to see new competitors and other competing technologies emerge.

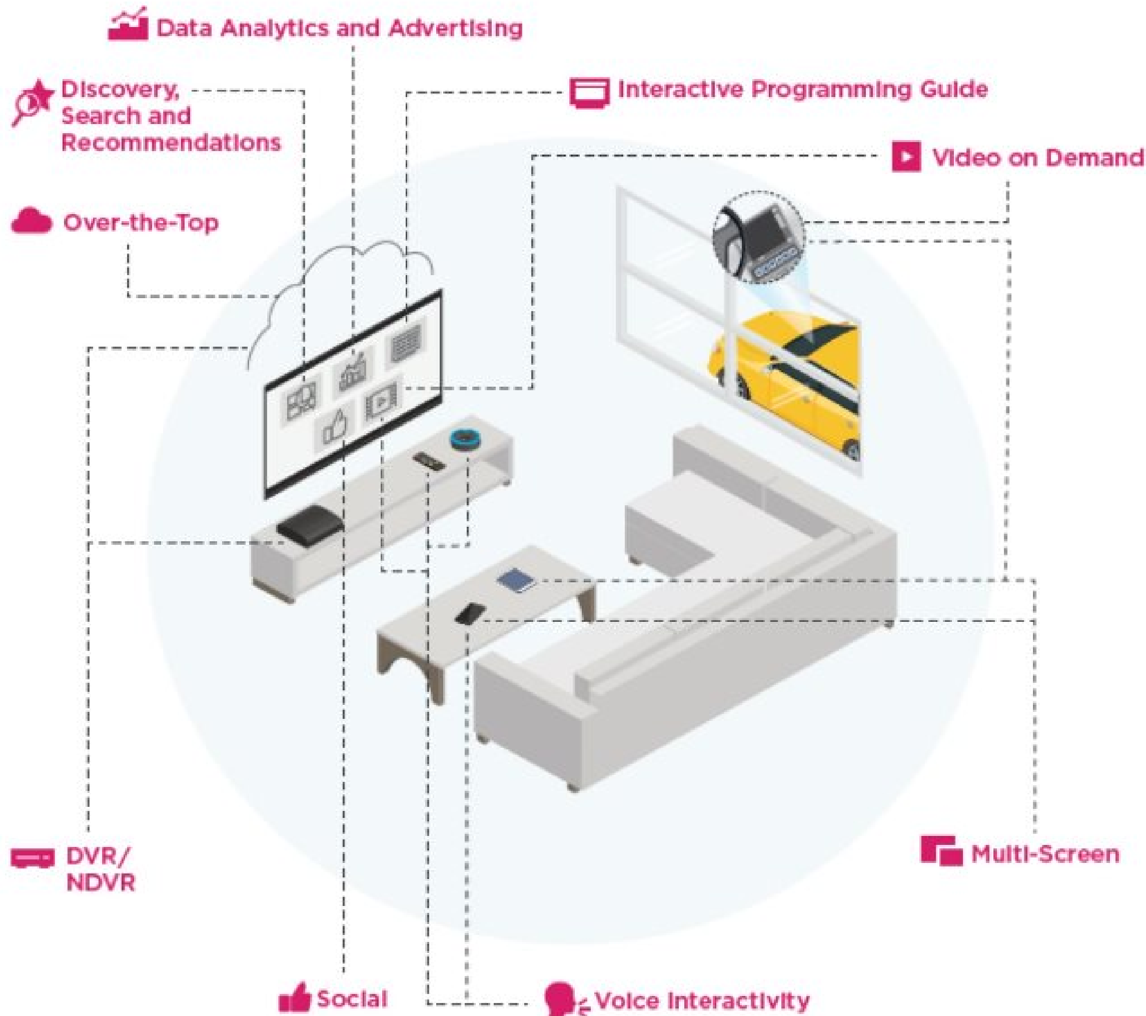
IP Licensing Segment

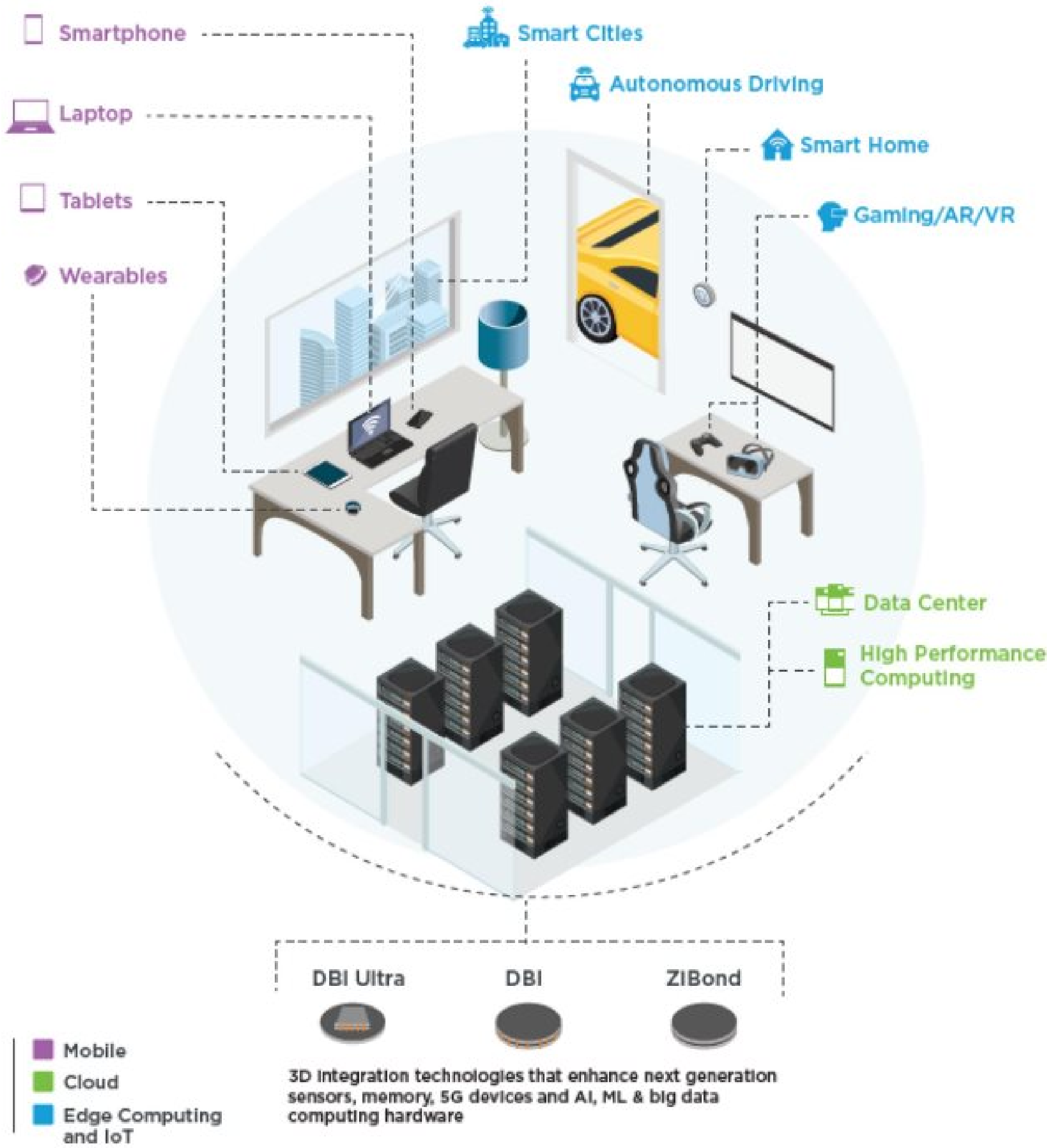
The IP Licensing segment consists primarily of licensing our innovations to leading companies in the media and semiconductor industries. Licensing arrangements include access to one or more of our foundational patent portfolios and may also include access to some of our industry-leading technologies and proven know-how.

Strategy

We have adopted a proactive strategy designed to protect and extend our technology and intellectual property. We continue to grow our patent portfolios in size and relevance through ongoing investment in internal innovation, strategic management of our portfolios, and targeted acquisitions.

- **Media**: We license our patented innovations for use with traditional linear television both in North America and internationally, and increasingly in connection with over-the-top and direct-to-consumer services that provide access to video inside and outside the home on a broad array of media consumption devices. We believe the continued growth of video consumption and the evolution of how consumers access and experience video present new opportunities for us to continue to develop patentable inventions, expand the industries we serve and to license additional patent rights.
- **Semiconductor**: With the rapidly rising cost and complexity of developing cutting-edge semiconductor manufacturing processes, the industry is increasingly looking toward advanced semiconductor packaging and 3D integration technologies to scale performance, power and cost for the next generation of electronics, including for 5G, IoT and cloud and edge computing enabled products. This trend presents new market opportunities for us as we continue to invest in the development, commercialization, and acquisition of such technologies, in particular hybrid bonding, and related IP.





Media IP

For more than a quarter century, we have invented and developed fundamental innovations that have shaped how consumers find, watch, and enjoy video, and how providers of video deliver immersive experiences. Our patented inventions broadly

cover all aspects of the video experience, including guidance, discovery, search, recommendations, DVR/NDVR, VOD, OTT, multi-screen, personalization, data analytics, advertising, and other interactive applications.

We license our media patent portfolios across multiple markets:

- **Multichannel Video Programming Distributors**: This market includes cable, satellite, and telecommunications television providers that aggregate and distribute linear content over their own networks (MVPDs), as well as television providers that aggregate and stream linear content over broadband networks (virtual MVPDs). Customers typically pay us a monthly per-subscriber fee and include many of the leading MVPDs and virtual MVPDs such as Altice USA (including Cablevision), AT&T (including DirecTV and AT&T Now), Charter, Comcast (including Sky), Cox, Dish Network (including Sling TV), Foxtel, Liberty Global, Shaw, Verizon, and Vodafone.
- **Over-The-Top Video Service Providers, Social Media and Other New Media Companies**: This market includes subscription video-on-demand ("SVOD") service providers that offer online services and devices that enable internet streaming and downloading of movies, television shows and other video programing, content providers, networks and media companies that provide content directly to consumers through a variety of business models (e.g. SVOD, AVOD, EST, etc.) and social media companies that increasingly rely on and incorporate video as an integral part of their offerings. Customers have typically paid us fixed fees for specified periods of time and include some of the leading new media companies including Discovery, Netflix, Starz, ViacomCBS and three of the leading social media companies.
- **Consumer Electronics (CE) Manufacturers**: Producers of content access points such as smart televisions, streaming media devices, video game consoles, mobile devices, Blu-ray players, DVRs/NDVRs, and other connected media devices. Our CE licensees typically are structured around license fees based on the number of units that utilize our patents, for specified products, in defined territories. Our agreements with some of the larger CE manufacturers generally allow them to ship an unlimited number of units, provided they pay us fixed fees for specified periods of time. Select customers include Funai, LG Electronics, Roku, Samsung Electronics, Sharp, Sony, and TCL.

Semiconductor IP

Our semiconductor business has a long, well-established history of inventing, developing, and broadly licensing advanced semiconductor packaging, 3D integration, and related technologies. Our patented solutions are integrated into semiconductors that are deployed in billions of mobile, consumer, and computing electronic products. Leveraging the combination of our highly experienced technologists, scientists and engineers and our advanced research and development labs in San Jose, California and Raleigh, North Carolina, we continue to develop industry-leading 3D integration solutions such as hybrid bonding that meet the demand for enhanced performance, functionality, power and cost for a wide range of applications including 5G, IoT, and cloud and edge computing.

We innovate and license our semiconductor patent portfolios and technology solutions across multiple markets:

- **Memory**. Providers of DRAM, High Bandwidth Memory (HBM) and NAND semiconductors commonly used in electronic products such as mobile phones, laptops, PCs, game consoles, and servers. Customers typically have paid us fixed fees for specified periods of time and include Samsung and SK hynix.
- **Sensors**. Providers of image and time-of-flights sensors used in mobile phones, consumer electronics and automobiles. Customers typically have paid us fixed fees for specified periods of time or a per-unit fee and include Canon, Omnivision, Samsung, and Sony.
- **RF Components**. Providers of switches and filters for cellular and wireless products such as mobile phones, tablets and laptops. Customers typically have paid us fixed fees for specified periods of time or a per-unit fee and include Broadcom and Silanna RF (acquired by Qualcomm).
- **Foundry**. Manufacturing service providers for fabless semiconductor companies who design and sell semiconductor products. Customers typically pay us a per-unit fee and include Teledyne DALSA, Tower Semiconductor, and UMC.

Competition

Due to the exclusionary nature of patent rights, we do not compete, in a traditional sense, with other patent holders for patent licensing relationships. Other patent holders do not have the same rights to the inventions and technologies encompassed by our patent portfolio. In any service, device or piece of equipment that contains intellectual property, the provider or manufacturer may need to obtain licenses from multiple holders of intellectual property. In licensing our patent portfolio, we compete with other patent holders for a share of the royalties that certain licensees may argue to be the total royalty that is supported by a certain service(s) or product(s), which may face practical limitations.

We compete primarily with internal technology development groups within our respective technology licensing markets, who may create their own solutions that compete with technologies that we license. In general, there may be several ways to solve a particular technical problem and there can be no assurance that our inventions and approaches will be the ones generally adopted by the industry. We also compete with other companies in acquiring patent portfolios.

Protecting Our Investment

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

Intellectual Property Portfolio

We operate in an industry in which innovation, investment in new ideas and protection of our intellectual property rights are critical for success. We protect our innovations and inventions through a variety of means, including but not limited to applying for patent protection domestically and internationally.

As of December 31, 2020, we held approximately 4,615 United States issued patents and 1,235 patent applications, as well as approximately 4,000 foreign issued patents and 1,650 patent applications. The last of the issued patents to expire is in 2039.

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

Research & Development

As demonstrated by our portfolio of industry recognized, widely-deployed advanced technologies and intellectual property (IP), we have a long track record of innovating in the fields of audio, imaging, video discovery, and semiconductors. We believe that ongoing investment in R&D is required for us to remain competitive in the markets we serve.

Today, we have a collection of world-class talent and strong research and development capabilities in various locations throughout the world. Starting with core research, machine learning and advanced algorithm development we continue to focus on IP development and next generation technology solutions. Our ongoing investment in R&D supported by a strong industry network of partners enables us to deliver differentiated, cost effective solutions that enhance the end user experience for an ever-larger universe of addressable markets.

Customer Concentration

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

	Years Ended December 31,		
	2020	**2019**	**2018**
Comcast Corporation	27%(1)	*	*
SK hynix Inc.	*	17%	12%
Intel Corporation	*	11%	*
Samsung Electronics, Co. Ltd.	*	*	38%

* denotes less than 10% of total revenue.

(1) Primarily related to revenue for past royalties recorded in the IP Licensing segment in the fourth quarter of 2020. We expect to recognize revenue related to this license agreement into 2031. For details, refer to “Note 4 – Revenue” of the Notes to Consolidated Financial Statements.

Legislative and Regulatory Actions

A number of government and legislative initiatives have been enacted to encourage development and implementation of technologies that protect the rights and intellectual property of the content owners. For example, the U.S. and other countries have adopted certain laws, including the Digital Millennium Copyright Act of 1998 ("DMCA") and the European Copyright Directive, which are aimed at the prevention of piracy of content and the manufacture and sale of products that circumvent copy protection technologies, such as those covered by our patents.

Compatibility Between Cable Systems and CE Equipment

The Federal Communications Commission (“FCC”) has been working for over a decade to implement a congressional mandate to create a competitive market for cable television STBs and other devices to access video programming on cable systems (“navigation devices”) and give consumers a choice in the devices used to access such programming, while still allowing the cable systems to have control over the secured access to their systems.

To meet its statutory obligation without compromising the security of video services, the FCC required cable systems to make available a security element (now known as a CableCARD) separate from the basic navigation device needed to access video program channels. In 2003, the FCC adopted regulations implementing an agreement between cable television system operators and CE manufacturers to facilitate the retail availability of so-called “plug and play” devices that utilize unidirectional CableCARDs, including digital televisions and other digital devices that enable subscribers to access cable television programming without the need for a STB (but without the ability for consumers to use interactive content). In September 2020, the FCC eliminated rules requiring cable providers to support CableCARD. While the cable industry has continued to provide CableCARDs for third-party devices like ours, we cannot predict the ultimate impact of any new technical equipment regulations on our business and operations. Current FCC regulations no longer prohibit multi-channel video service providers from deploying navigation devices with combined security and non-security functions, further developments with respect to these issues could impact the availability and/or demand for “plug and play” devices, particularly bi-directional devices and STBs, all of which could affect demand for UXs incorporated in STBs or CE devices.

General Government Regulation

We are subject to a number of foreign and domestic laws and regulations that affect companies that import or export software and technology, including encryption technology, such as the U.S. export control regulations as administered by the U.S. Department of Commerce.

We are also subject to a number of foreign and domestic laws that affect companies conducting business on the internet. In addition, because of the increasing popularity of the internet and the growth of online services, laws relating to user privacy, freedom of expression, content, advertising, accessibility, network neutrality, information security and intellectual property rights are being debated and considered for adoption by many countries throughout the world. Each jurisdiction may enact different standards, which could impact our ability to deliver data, services or other solutions through the internet.

We are subject to international laws (including the General Data Protection Regulation) associated with data protection, privacy, and other aspects of our business in Europe and elsewhere and the interpretation and application of data protection laws remains uncertain. In addition, because our services are accessible worldwide, foreign jurisdictions may claim that we are required to comply with their laws. Further, the application of existing laws regulating or requiring licenses for certain businesses of our advertisers can be unclear. The resulting regulation, if any, may alter our ability to target advertising or provide data about the end-users and/or customers and their behavior.

Additionally, the privacy regulatory landscape in the U.S. changes rapidly and we may become subject to new privacy or cybersecurity regulations. Such laws and regulations could affect our ability to process personal data (in particular, our ability to use certain data for purposes such as risk or fraud avoidance, marketing or advertising), our ability to control our costs by using certain vendors or service providers or our ability to offer certain services in certain jurisdictions. For example, the California Consumer Privacy Act, or CCPA, became effective on January 1, 2020. The CCPA creates new individual privacy rights for consumers (as that word is broadly defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. The CCPA requires covered companies to provide new disclosures to California consumers, provide such consumers new ways to opt-out of certain sales of personal information and allows for a new cause of action for data breaches. It is unclear how the CCPA will be interpreted, but as currently written, it will likely impact our business activities and exemplifies the vulnerability of our business to not only cyber threats but also the evolving regulatory environment related to personal data.

In the U.S., service providers have been subject to claims of defamation, libel, invasion of privacy and other data protection claims, torts, unlawful activity, copyright or trademark infringement, or other theories based on the nature and content of the materials searched and the ads posted or the content generated by users. In addition, several other federal laws could have an impact on our business. For example, the DMCA has provisions that limit, but do not eliminate, our liability for hosting or linking to third-party websites that include materials that infringe copyrights or other rights, so long as we comply with the statutory requirements of this act. The Children's Online Privacy Protection Act restricts the ability of service providers to collect information from minors and the Protection of Children from Sexual Predators Act of 1998 requires service providers to report evidence of violations of federal child pornography laws under certain circumstances.

Human Capital Resources

The opportunities for our success and growth depend in large part on our ability to attract, develop, and retain a talented and engaged workforce. In particular, we are competing for technical talent and we need to offer not only robust and attractive compensation packages but also provide broad opportunities for our employees to make an impact, grow, and develop. As of December 31, 2020, we had a global talent base consisting of approximately 1,850 full-time employees.

To enable our talent to actively contribute to, and have a positive impact on, the overall business and culture, we developed and maintain a set of programs and initiatives. These programs include competitive compensation and benefits offerings, skill and management development, diversity and inclusion initiatives, goal and performance management, and succession planning. In support of these efforts, our Board of Directors monitors these programs and initiatives and provides guidance and feedback as appropriate. Our goal is to provide a work environment that empowers our teams and enables them to enjoy a healthy and productive work-life balance for themselves, their families, and our community.

Our incentives are based on merits, and we have a strong pay-for-performance culture. We benchmark our total rewards annually to ensure our compensation and benefit programs remain competitive with industry peers. Our compensation framework for employees reflects a combination of fixed and variable pay including base salary, bonuses, performance awards, and stock-based compensation. We offer employees benefits that vary by country and are designed to meet or exceed local laws and are competitive in the marketplace.

We invest in the career growth of our employees by providing a wide range of development opportunities, including face-to-face, virtual, social and self-directed learning, mentoring, coaching, and external development. Annual assessments are performed to identify talent needs based on department goals and to evaluate how each function is positioned from a talent perspective. We believe in the principles of a learning organization and strive to provide continuous educational opportunities for our employees. In 2020, we invested in a global online learning platform. More than 200 courses and programs have been created, offering a wide range of skill development opportunities for employees to become more knowledgeable and effective in their roles. Additionally, we also offer customized leadership and management development programs for our management teams.

We leverage our manager ecosystem, coupled with industry-standard performance management tools, to align corporate goals with employee objectives. Employees are encouraged to create and align individual, functional and team-based goals, track performance against goals, write self-evaluations, and solicit feedback.

We have demonstrated support and commitment to developing a culture of non-discrimination and embracing diversity and inclusion throughout our workforce. Our current employee resource groups represent the LGBTQ+ community, the black community, women, and veterans. We also have formed a Diversity and Inclusion council comprised of all levels of employees and senior executives. The purpose of the council is, among other things, to identify and address issues of diversity and inclusion through multiple and unique perspectives from a diverse group of our employees. In June 2020, we joined the business coalition in support of the Equality Act, a measure that supports federal legislation that would provide the same basic protections to LGBTQ+ people as are provided to other protected groups under federal law. Additionally, we comply fully with California’s board diversity legislation that requires a minimum number of female directors and directors from underrepresented communities.

We measure employee experience by collecting insight and understanding of engagement and satisfaction. We use an employee engagement survey, executive roundtables, and employee focus groups to solicit input. Task forces are regularly created to identify and address gaps which result in changes to policies and practices and benefits offerings. A recent survey to assess employee well-being during the initial working-from-home period related to the COVID-19 pandemic resulted in the payment of working-from-home stipend to employees which covered certain costs associated with setting up home offices.

During the ongoing COVID-19 pandemic, we have focused on the health, safety, and well-being of our employees. We have:

- Established office reentry guidelines consistent with CDC and local government mandates
- Conducted a working-from-home survey to pulse check employee well-being
- Offered various training and learning opportunities, including relevant trainings to help employees better manage remote working, childcare, social isolation, etc.
- Enhanced internal communications strategies using multiple vehicles such as a corporate intranet, Zoom, Slack, videos, etc., to ensure connection and contacts with employees
- Provided a number of well-being offerings and events, including online yoga, Headspace (a mindfulness app), various online contests, and virtual happy hours

None of our employees are covered by a collective bargaining agreement or are represented by a labor union. We have not experienced any organized work stoppages, and we consider the relationships with our employees to be positive.

Available Information

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

Item 1A. Risk Factors

Our operations and financial results are subject to various risks and uncertainties, including those described below, that could adversely affect our business, financial condition, results of operations, cash flows, and the trading price of our common stock. Any of the following risks and uncertainties may be exacerbated by the impacts of the COVID-19 pandemic and related events.

Risk Factor Summary

- We may not be able to successfully integrate the businesses of Xperi Corporation and TiVo Corporation in a cost-effective manner or realize the anticipated benefits from the Mergers.
- We may not be able to complete the contemplated business separation in a timely manner or at all, and even if such separation occurs, we may not achieve the expected benefits (including the tax treatment) of such transaction.
- Our business has been, and is expected to continue to be, impacted by the global COVID-19 pandemic.
- We enter into license agreements that have fixed expiration dates and if, upon expiration or termination, we are unable to renew or replace such license agreements on terms favorable to us, our results of operations could be harmed.
- The nature of some of our business relationships may restrict our ability to operate freely in the future and could be interpreted in a manner that adversely affects revenues, including from licensing, under those agreements.
- The success of our patent licensing business is dependent on the quality of our patent assets and our ability to create and implement new technologies or expand our licensable technology through acquisitions.
- The structure and timing of our license and settlement agreements may cause fluctuations in our quarterly or annual financial results.
- The long-term success of our business is dependent on a royalty-based business model, which is inherently risky.
- It is difficult for us to verify royalty amounts owed to us under our licensing agreements, and we may lose revenue.
- If we fail to develop and deliver, on a timely basis, innovative technologies and services in response to changes in our markets and industries, our business could decline.
- We face competitive risks in the provision of entertainment offerings involving the distribution of digital content provided by third party application providers through broadband.
- Our pursuit of acquisitions and divestures may adversely affect our business or stock price if we cannot successfully execute our strategies and may be impossible to execute due to the lack of acceptable financing or for other reasons.
- If we fail to protect and enforce our intellectual property rights, contract rights, our confidential information, or our brand, or if third parties assert that we violate their intellectual property rights, our business may suffer.
- Our licensees may delay, refuse to or be unable to make payments to us due to financial difficulties or otherwise, or shift their licensed products to other companies to lower their royalties to us.
- Some of our Semiconductor IP license agreements may convert to fully paid-up licenses at the expiration of their terms, or upon certain milestones, and we may not receive royalties after that time.

- If we are unable to maintain a sufficient amount of content released in the DTS audio format, demand for the technologies, products, and services that we offer to consumer electronics product manufacturers may significantly decline, which would adversely impact our business and prospects.
- Demand for our HD Radio technology may be insufficient to sustain projected growth.
- If we are unable to further penetrate the streaming and downloadable content delivery markets and adapt our technologies for those markets, our royalties and ability to grow our business could be adversely impacted.
- The success of certain of our solutions depends on the interoperability of our technologies with consumer hardware devices.
- Our failure to adequately manage our increasingly complex distribution agreements, including licensing, development and engineering services, may cause unexpected delays and loss of revenue in the deployment of advanced television solutions.
- We make significant investments in new products and services that may not achieve technological feasibility or profitability or that may limit our growth.
- Our products and services could be susceptible to errors, defects, or unintended performance problems that could result in lost revenue, liability or delayed or limited market acceptance.
- Dependence on the cooperation of pay-TV service providers, television broadcasters, hardware manufacturers, data providers and delivery mechanisms could adversely affect our revenue.
- We are dependent on third parties for metadata and content.
- We depend on a limited number of third parties to design, manufacture, distribute and supply hardware devices upon which our TiVo software and service operate.
- We maintain inventories of TiVo-branded products based on our demand forecast, which may be incorrect and lead to our carrying excess or insufficient inventory.
- Qualifying, certifying and supporting our technologies, products and services is time-consuming and expensive.
- We are exposed to the risks related to international sales and operations.
- Further deterioration of trade relations between the United States and China, other trade conflicts and barriers, economic sanctions, and national security protection policies could limit or prevent existing or potential customers from doing business with us.
- Our systems, networks and online business activities are subject to cybersecurity and stability risks, information technology system failures, and security breaches.
- Our business operations are subject to natural disasters and industry-wide failure and adverse events.
- Changes in U.S. generally accepted accounting principles could affect our financial position and results of operations.
- We have significant indebtedness which could adversely affect our financial position.
- Our variable rate indebtedness may expose us to interest rate risk, which could cause our debt costs to increase significantly.
- We may not be able to generate sufficient cash to service our debt obligations.
- Repayment of debt is dependent on cash flow generated by our subsidiaries and their respective subsidiaries.
- If our goodwill and other intangible assets become impaired, we may be required to record a significant charge to earnings.
- We have identified material weaknesses in our internal control over financial reporting related to management review of our forecast assumptions underlying our goodwill impairment analysis and acquisition accounting, which could, if not remediated, adversely affect our ability to report our financial and operating results accurately or on a timely basis, and impact overall investor confidence and the value of our common stock.
- Changes in, or interpretations of, tax rules and regulations, could adversely affect our effective tax rates and negatively affect our business and financial condition.
- Our effective tax rate depends on our ability to secure the tax benefits of our international corporate structure, on the application of the tax laws of various jurisdictions and on how we operate our business.
- Our subsidiaries have in the past recorded, and may in the future record, significant valuation allowances on our deferred tax assets, and the recording and release of such allowances may have a material impact on our results of operations.
- The IRS may assert positions that may negatively impact the tax-free status of distributions intended to qualify for tax-free treatment, and the desired benefits of such distributions may not be achieved.

- The investment of our cash, cash equivalents and investments in marketable debt and equity securities is subject to risks which may cause losses and affect the liquidity of these investments.
- New governmental regulations or new interpretations of existing laws, including legislative initiatives seeking to, or judicial or regulatory decisions that, weaken patent protection or copyright law, could cause legal uncertainties and result in harm to our business.
- Failure to safeguard the security and privacy of our customers' confidential data and remain in compliance with laws that govern such data may harm our reputation and brand and expose us to legal action.
- Current and future governmental and industry standards may significantly limit our business opportunities.
- Our activities to advertise, market and sell our services directly to consumers are highly impacted by constantly evolving state and federal laws and regulations.
- Some software we provide may be subject to "open source" licenses, which may restrict how we use or distribute our software or require that we release the source code of certain products subject to those licenses.
- Our financial and operating results may vary, which may cause the price of our common stock to decline.
- Seasonal trends may cause our quarterly operating results to fluctuate and our inability to forecast these trends may adversely affect the market price of our common stock.
- We may not pay dividends or pay dividends at a consistent rate, and any decrease in or suspension of the dividend could cause our stock price to decline.
- Our stock repurchase program could increase the volatility of the price of our common stock, and the program may be suspended or terminated at any time, which may cause the trading price of our common stock to decline.
- Provisions of our certificate of incorporation and bylaws or Delaware law might delay or prevent a change of control transaction and depress the market price of our stock.
- Decreased effectiveness of stock-based compensation could adversely affect our ability to attract and retain employees.
- Use of our common stock for future acquisitions may be limited.
- Stock transfer restrictions in our certificate of incorporation may act as an anti-takeover device.
- Our amended and restated certificate of incorporation contains forum selection provisions that could limit the ability of stockholders to bring claims against us and our directors, officers and employees in jurisdictions preferred by stockholders.

Risks Relating to Integration of the Combined Company and Planned Separation of the IP and Product Businesses

We may not be able to complete the contemplated business separation in a timely manner or at all, and even if such separation occurs, we may not achieve the expected benefits (including the tax treatment) of such transaction.

As previously disclosed, we intend to pursue a separation of our product business and IP licensing business through a tax-efficient transaction, resulting in two independent, publicly traded companies. We are currently in the planning stage for such separation and are evaluating the optimal timing of the contemplated business separation. We currently project that the separation will not be completed earlier than the first half of 2022. In the event that our board decides to proceed with any contemplated business separation transaction, we currently anticipate that such contemplated business separation transaction, if undertaken, would be achieved through a pro-rata spin-off transaction intended to qualify as tax-free under Section 355 of the Code, in which our stockholders, at such time, would receive shares of capital stock in the resulting spun-off company. Our board may ultimately determine to abandon any contemplated business separation transaction, and such determination could have an adverse impact on the value of our company. Additionally, there are many determinations with respect to undertaking a contemplated business separation that, by their nature, cannot be determined until we fully understand our combined business operations, including definitive determinations with regard to the capital structure of the two businesses and allocation of liabilities among them. As such, there are many factors that could impact the structure or timing of, the anticipated benefits from, or determination to ultimately proceed with, any contemplated business separation, including, among others, global and regional economic conditions, instability in credit markets, declining consumer and business confidence, fluctuating commodity prices and interest rates, volatile exchange rates, tax considerations, and other challenges that could affect the global economy, specific market conditions in one or more of the industries of the businesses proposed to be separated, and changes in the regulatory or legal environment. Such changes could adversely impact the value of a contemplated business separation transaction to the combined company's stockholders. Additionally, to the extent our board determines to proceed with any contemplated business separation, the consummation of such transaction is a complex, costly and time-consuming process, and there can be no guarantee that such separation will be completed in accordance with the timeline that we establish or achieve the intended benefits (including the tax treatment). An inability to realize the full extent of the anticipated benefits (including the tax treatment) of any contemplated business separation, as well as any delays encountered in the process, could have an adverse effect upon the revenue, level of expenses and operating results of the product business, the IP licensing business and/or the combined company.

We may not be able to successfully integrate and combine the businesses of Xperi Corporation and TiVo Corporation and we may not realize the anticipated benefits from the Mergers.

On June 1, 2020, we completed the previously announced Mergers between Xperi Corporation ("Xperi") and TiVo Corporation ("TiVo") as contemplated by the Agreement and Plan of Merger and Reorganization, dated as of December 18, 2019, as amended on January 31, 2020, by and among us, Xperi, TiVo and other parties thereto. The integration and combination of the separate operations of the combined businesses is a complex and time-consuming process that has required and may continue to require substantial resources and effort. We may face significant challenges in completing the consolidation of our combined operations, integrating technologies, procedures, and policies, as well as addressing the different corporate cultures. If we are not successfully integrated, the anticipated benefits of the Mergers may not be realized fully (or at all) or may take longer to realize than expected.

We must successfully combine the businesses of Xperi and TiVo in a manner that permits expected synergies to be realized. In addition, we must achieve the anticipated synergies in a timely manner and without adversely affecting current revenue and investments in future growth. If we are not able to successfully achieve these objectives (including in a manner that does not negatively affect any contemplated business separation), the anticipated benefits of the Mergers may not be realized fully or at all or may take longer to realize than expected. We may face significant challenges in implementing such integration, including without limitation:

- difficulties integrating product technologies in a manner that creates technical synergies or that yields new or improved product applications in targeted markets;
- latent impacts resulting from the diversion of management team's attention from ongoing business concerns as a result of the devotion of management's attention to the Mergers and performance shortfalls of the respective businesses;
- ongoing diversion of the attention of management from the operation of the combined company's business as a result of any contemplated business separation;
- difficulties in achieving anticipated synergies, business opportunities and growth prospects;
- the possibility of faulty assumptions underlying expectations regarding the integration process, including with respect to the intended tax efficient transactions;
- unanticipated issues, costs, and strained resources in integrating information technology, communications programs, financial procedures and operations, and other systems, procedures, and policies;

- difficulties in managing a larger combined company, addressing differences in business culture and retaining key personnel, and employees;
- unanticipated changes in applicable laws and regulations;
- managing tax costs or inefficiencies associated with integrating the operations of the combined company and any contemplated tax efficient separation transaction;
- failure to maintain relationships with existing customers, including customers who may be unfamiliar with the combined company and may perceive conflict with the combined intellectual property business;
- failure to accurately forecast and communicate the long-term value or profitability of either business, including as a result of any failure to implement the business strategy;
- uncertainty that employees may experience about their roles within the combined company and following any contemplated business separation, which may have an additional adverse effect on our ability to attract or retain key management personnel and other key employees; and
- coordinating geographically separate organizations.

Some of these factors will be outside of our control and any one of them could result in increased costs and diversion of management's time and energy, as well as decreases in the amount of expected revenue which could materially impact our business, financial condition and results of operations. The integration process and other disruptions resulting from the Mergers may also adversely affect our relationships with employees, suppliers, customers, distributors, licensors and others, and difficulties in integrating the separate businesses or regulatory functions could harm the reputation of the combined company. In addition, we may not be able to persuade markets to adopt new products or technologies developed as a result of the integration, which may cause a decline of our revenue. If we are not able to adequately address integration challenges, we may be unable to successfully complete the integration of our operations, effect any contemplated business separation or realize the anticipated benefits of the Mergers.

We have incurred and will incur significant costs in connection with the integration of the combined company.

We are in the process of integrating a large number of processes, policies, procedures, operations, technologies and systems in connection with the consummation of the Mergers. While we have assumed that a certain level of expenses would be incurred in connection with the Mergers and post-merger activities, there are many factors beyond our control that could affect the total amount of, or the timing of, anticipated expenses with respect to the integration and implementation of the combined businesses, which may exceed the level of expenses that we have anticipated.

Our future results will suffer if we do not effectively manage our expanded operations following the Mergers.

Our future success depends, in part, upon our ability to manage our expanded business as a result of the Mergers, which may pose substantial challenges for management, including but not limited to, challenges related to the management and monitoring of a greater volume and variety of operations, expanded managerial systems and financial controls and associated increased costs and complexity. We may also face significant challenges in the ongoing training and managing the combined employee base and meeting demand and quality standards required by existing and potential customers. There can be no assurance that the combined company will be successful or that it will realize the expected operating efficiencies, cost savings, revenue enhancements and other benefits that we anticipated from the Mergers.

We may not be able to rationalize and effectively manage our disparate business operations, which may cause us to dispose of or discontinue product lines, technologies, assets or operations if they do not fit into the strategic vision or meet forecasted results.

While we believe that the product and IP licensing businesses of the combined company after the Mergers are complementary and create significant synergy, our future efforts to rationalize the disparate business operations could require our management to refocus on certain business operations while disinvesting in others. We have been integrating the respective product and licensing businesses and operating them as separate business units in order to facilitate a potential separation of these units at a later date. Additionally, as business strategy and product markets continue to evolve, we may dispose, discontinue, or divest product lines or business divisions. Disposing or discontinuing existing product lines or business divisions, or separating business units, provides no assurance that operating expenses will be reduced or will not cause us to incur material charges associated with such decision. Furthermore, the disposition or discontinuance of an existing product line or business division, or separation or spinoff of a business unit, entails various risks, including the risk of not being able to obtain a purchaser, or, if obtained, that the purchase price may not be equal to at least the net asset book value for the product line or business unit, or the value that investors place on it as reflected by our stock price. We may not be able to achieve any separation of our product and licensing businesses despite our current consideration of such a separation. Other risks of such actions include adversely affecting employee morale, managing the expectations of, and maintaining good relations with, customers of disposed or discontinued product lines or business divisions, which could prevent selling other products to them. We may also incur other

significant liabilities and costs associated with disposal or discontinuance of product lines or business divisions, or separation of business units, including employee severance costs, relocation expenses, and impairment of lease obligations and long-lived assets. The effects of such actions may adversely impact our business operations and financial results.

Risks Relating to Our Business Operations

Our business and results of operations have been, and are expected to continue to be, impacted by the global COVID-19 pandemic.

Our business and results of operations have been adversely affected by the global COVID-19 pandemic and related events and we expect its impact to continue. Given the ongoing and dynamic nature of the circumstances, it is difficult to predict the full impact of the COVID-19 pandemic on our businesses, and there is no guarantee that we will be able to address its adverse impacts fully or effectively. The impact to date has included periods of significant volatility in various markets and industries. The volatility has had, and we anticipate it will continue to have, an adverse effect on our customers and on our business, financial condition and results of operations, and may result in an impairment of our long-lived assets, including goodwill, increased credit losses and impairments of investments in other companies. In particular, the automotive market, as well as the broad consumer electronics industries, have been and we anticipate will continue to be impacted by the pandemic and/or other events beyond our control, and further volatility could have an additional negative impact on these industries, customers, and our business. For example, we experienced an approximately 15% decline in our royalty revenue in 2020 from our products sold to the automotive market, such as HD Radio, as compared to the prior year, and currently expect automotive royalties will remain below previous levels for at least the near-term. In addition, the COVID-19 pandemic and to a lesser extent, U.S. restrictions on trade with certain Chinese customers have and may continue to impact the financial conditions of our customers, who may not be able to satisfy their obligations under our agreements timely or at all. For example, we recorded provisions for credit losses of approximately $2.0 million and $4.3 million in the first and fourth quarters of 2020, respectively, due to the heightened risk of nonpayment on existing accounts receivable as a result of the impaired financial condition and liquidity positions of certain of our customers.

In addition, actions by United States federal, state and foreign governments to address the COVID-19 pandemic, including travel bans, stay-at-home orders and school, business and entertainment venue closures, also had a significant adverse effect on the markets in which we conduct our businesses. COVID-19 poses the risk that our workforce, suppliers, and other partners may be prevented from conducting normal business activities for an indefinite period of time, including due to shutdowns or stay-at-home orders that may be requested or mandated by governmental authorities. We also implemented policies to allow our employees to work remotely as a result of the pandemic as we reviewed processes related to workplace safety, including social distancing and sanitation practices recommended by the Centers for Disease Control and Prevention. The impacts of the COVID-19 pandemic could also cause delays in obtaining new customers and executing renewals and could also impact our business as consumer behavior changes in response to the slowed economic conditions. Furthermore, our integration effort following the Mergers may be delayed or interrupted due to the operational challenges and various restrictions and limitations imposed on us as result of the COVID-19 pandemic, which may adversely affect the success of the integration and anticipated benefits of the Mergers.

The extent of impacts resulting from the COVID-19 pandemic and other events beyond our control will depend on future developments, which are highly uncertain and cannot be predicted, including new information which may emerge concerning the severity of the pandemic, actions taken to contain the coronavirus or its impact, the emergence of transmissible or severe strains of coronavirus, the speed at which recently authorized vaccines are administered and the effectiveness of these vaccines in slowing the pandemic, and divergent government orders and actions taken in response to the pandemic, among others. Even after the pandemic has subsided and economic activities gradually reopen and increase, we may continue to experience material and adverse impacts to our business, operating results, and financial condition as a result of the pandemic’s lasting global economic impact, including any recession that has occurred or may occur in the future. The ultimate impact of the COVID-19 pandemic or a similar health epidemic is highly uncertain and subject to change. We do not yet know the full extent of potential delays or impacts on our applicable business, operations or the global economy.

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

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

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

The nature of some of our business relationships may restrict our ability to operate freely in the future and could be interpreted in a manner that adversely affects revenues, including from licensing, under those agreements.

From time to time, we have engaged and may engage in the future in discussions with other parties concerning business relationships, which have included and may in the future include exclusivity provisions (such as geographic or product specific limitations), most favored customer limitations, and patent licensing arrangements. While we believe that such business relationships have historically enhanced our ability to finance and develop our business model or otherwise were justified by the terms of the particular relationship, the terms and conditions of such business relationships may place some restrictions on the operation of our business, including where we operate, who we work with, and what kinds of activities we may engage in, in the future. Additionally, some of our license agreements contain "most favored nation" clauses. These clauses typically provide that if we enter into an agreement with another licensee on more favorable terms, we must offer some of those terms to our existing licensees. We have entered into a number of license agreements with terms that differ in some respects from those contained in other agreements. These agreements may obligate us to provide different, more favorable, terms to licensees, which could, if applied, result in lower revenues or otherwise adversely affect our business, financial condition, and results of operations. While we believe that we have appropriately complied with the most favored nation terms included in our license agreements, these contracts are complex and other parties could reach a different conclusion that, if enforced, could have an adverse effect on our financial condition or results of operations.

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

We derive a significant portion of our revenue from patent licenses and royalties, including structured settlement payments. The success of our patent licensing business depends on our ability to continue to develop and acquire high quality patents. We devote significant resources to developing new technologies and to developing and acquiring patents to address the evolving needs of the media and semiconductor industries, and we must continue to do so in the future to remain competitive. Developments in our technologies are inherently complex and require long development cycles and a substantial investment before we can determine their commercial viability. Moreover, competition for acquiring high quality patents is intense and there is no assurance that we can continue to acquire such patents on favorable terms. We may not be able to develop and market new or improved technologies, or to develop or acquire high quality patents, in a timely or commercially acceptable fashion. Furthermore, our patents will expire in the future. Our current U.S. issued patents expire at various times through 2039. We need to develop or acquire successful innovations and obtain royalty-generating patents on those innovations before our current patents expire, and our failure to do so would significantly harm our business, financial position, results of operations and cash flows.

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

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

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

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

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

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

- the number of subscribers our pay-TV customers have or the number of set top-boxes our pay-TV customers provide to their end-user subscribers;
- the rate of adoption and incorporation of our technology by semiconductor manufacturers, assemblers, foundry, manufacturers of consumer and communication electronics, and the automotive and surveillance industry;
- the willingness and ability of materials and equipment suppliers to produce materials and equipment that support our licensed technology, in a quantity sufficient to enable volume manufacturing;
- the ability of our customers to purchase such materials and equipment on a cost-effective and timely basis;
- the length of the design cycle and the ability of us and our customers to successfully integrate certain of our imaging technologies into their integrated circuits;
- the demand for products that incorporate our licensed technology;
- the cyclicality of supply and demand for products using our licensed technology;
- the impact of economic downturns; and
- the impact of poor financial performance of our customers.

For example, the ability to enjoy digital entertainment content downloaded or streamed over the internet has caused some consumers to elect to cancel their pay-TV subscriptions. If our pay-TV customers are unable to maintain their subscriber bases, the royalties they owe us may decline.

Our licensees may delay, refuse to or be unable to make payments to us due to financial difficulties or otherwise, or shift their licensed products to other companies to lower their royalties to us.

A number of our customers may face severe financial difficulties from time to time, which may result in their inability to make payments to us in a timely manner, or at all. These risks may be heightened by operating and cash flow disruptions these companies face as a result of the COVID-19 pandemic. In addition, we have had a history of, and we may in the future experience, customers that delay or refuse to make payments owed to us under license or settlement agreements. Our customers may also merge with or may shift the manufacture of licensed products to companies that are not currently licensees of our technology. This could make the collection process complex and difficult, which could adversely impact our business, financial condition, results of operations and cash flows.

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

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

If we fail to develop and timely deliver innovative technologies and services in response to changes in our markets and industries, our business could decline.

The markets for our products, services and technologies are characterized by rapid change and technological evolution and obsolescence, new and improved product introduction, changing consumer demand, increasingly competitive landscape, and evolving industry standards. We will need to continue to expend considerable resources on research and development in the future in order to continue to design, deliver and enhance innovative audio, imaging, media, entertainment, and semiconductor products, services and technologies. The development of enhanced and new technologies, products, and services is a complex, costly and uncertain process requiring high levels of innovation, highly skilled engineering and development personnel, and the accurate anticipation of technological and market trends. Despite our efforts, we:

- may not receive significant revenue from our current research and development efforts for several years, if at all;
- cannot assure you that the level of funding and significant resources we are committing for investments in new products, services and technologies will be sufficient or result in successful new products, services or technologies;
- cannot assure you that our newly developed products, services or technologies can be successfully protected as proprietary intellectual property rights or will not infringe the intellectual property rights of others;
- cannot assure you that any new products or services that we develop will achieve market acceptance;
- cannot prevent our products, services and technologies from becoming obsolete due to rapid advancements in technology and changes in consumer preferences;
- cannot assure you that revenue from new products, services or technologies will offset any decline in revenue from our products, services and technologies which may become obsolete;
- cannot assure you that our competitors and/or potential customers may not develop products, services or technologies similar to those developed by us, resulting in a reduction in the potential demand for our newly developed products, services or technologies; and
- may not correctly identify new or changing market trends at an early enough stage to capitalize on market opportunities.

Furthermore, the decision by a party dominant in the value chain to provide competing technologies at very low or no cost could cause our customers and other manufacturers not to utilize our technologies or services. Our customers may choose to use technologies that their own in-house engineering teams have developed, or in which they have an interest. Accordingly, our revenue could decline if our customers choose not to incorporate our technologies in their products, or if they sell fewer products incorporating our technologies. Our failure to successfully develop new and improved products, services and technologies, including as a result of any of the risks described above, may reduce our future growth and profitability and may adversely affect our business, results and financial condition.

Our products and services face intense competition from various sources, and we may not be able to compete effectively.

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

- our audio technologies compete with other providers of audio products and services, with Dolby Laboratories as the primary competitor in high-definition audio processing, which enjoys advantages in selling its digital multi-channel audio technology, having introduced such technology before we did, and having achieved mandatory standard status in product categories that we have not, including terrestrial digital TV broadcasts in the United States;
- our embedded image processing technologies such as Face Detection and our other products compete with other image processing software vendors such as ArcSoft, Inc. as well as internal design groups of mobile phone and digital camera manufacturers providing similar technologies by employing different approaches;
- our Platform Solutions face significant competition from companies that produce and market program guides as well as television schedule information in a variety of formats, including passive and interactive on-screen electronic guide services, online listings, over the top applications and against customers and potential customers who choose to build their own IPG, including both those who do and those who do not elect to license our patents;

- our advanced video solutions compete with other CE products and home entertainment services (such as Roku, AppleTV, Amazon FireTV and Chromecast) as well as products and service offerings built by other service providers or their suppliers for consumer spending; and
- our competitive position is affected by the rate of adoption and incorporation of our technology by semiconductor manufacturers, assemblers, foundry, manufacturers of consumer and communication electronics, and the automotive and surveillance industry.

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

Some of our current or future competitors may have significantly greater financial, technical, marketing and other resources than we do, may enjoy greater brand recognition than we do, or may have more experience or advantages than we have in the markets in which they compete. Further, many of the consumer hardware and software products that include our technologies also include technologies developed by our competitors. As a result, we must continue to invest significant resources in product development in order to enhance our technologies and our existing products and services and introduce new high-quality technologies, products and services to meet the wide variety of such competitive pressures. Our ability to generate revenue from our business will suffer if we fail to do so successfully.

We face competitive risks in the provision of entertainment offerings involving the distribution of digital content provided by third party application providers through broadband.

We have previously launched access in certain of our products and services to the entertainment offerings of Amazon Prime Video, Netflix, Hulu Plus, HBO Max, Disney+, VUDU, Pandora, and others for the distribution of digital content directly to broadband-connected TiVo devices. These entertainment offerings typically involve no significant long-term commitments. We face competitive, technological and business risks in our ongoing provision of entertainments offering involving the distribution of digital content through broadband to consumer televisions with such offerings, including the availability of premium and high-definition content, as well as the speed and quality of the delivery of such content to TiVo devices. For instance, we face increased competition from a growing number of broadband-enabled devices from providers such as Roku, AppleTV, Amazon Prime Video and Chromecast that provide broadband delivered digital content directly to a consumer's television connected to such a device. Additionally, we face competition from online content providers and other PC software providers who deliver digital content directly to a consumer's personal computer, which in some cases may then be viewed on a consumer's television. If we are unable to provide a competitive entertainment offering on our own, or an equivalent offering with other third parties, the attractiveness of the TiVo service to new subscribers would be harmed as consumers increasingly look for new ways to receive and view digital content and our ability to retain and attract subscribers would be harmed.

Our future success depends on our ability to establish and maintain licensing relationships with companies in related business fields, including:

- Pay-TV service providers;
- operators of entertainment content distributors, including PPV and VOD networks;
- CE, digital set-top hardware manufacturers, DVD hardware manufacturers and personal computer manufacturers;
- motion-picture studios;
- semiconductor and equipment manufacturers;
- content rights holders;
- retailers and advertisers;
- digital rights management suppliers; and
- internet portals and other digital distribution companies.

Substantially all of our license agreements are non-exclusive, and therefore our licensees are free to enter into similar agreements with third parties, including our competitors. Our licensees may develop or pursue alternative technologies either on their own or in collaboration with others, including our competitors.

Some of our third-party license arrangements require that we license others' technologies and/or integrate our solutions with others. In addition, we rely on third parties to report usage and volume information to us. Delays, errors or omissions in this information could harm our business. If these third parties choose not to support integration efforts or delay the integration of our solutions, our business could be harmed.

Relationships have historically played an important role in the entertainment industries that we serve. If we fail to maintain and strengthen these relationships, these industry participants may not purchase and use our technologies or facilitate the adoption of our technologies, which will harm our results of operations and prospects and may make it more difficult for us to enter into new markets. In addition, if major industry participants form strategic relationships that exclude us, our business and prospects could be materially adversely affected.

Our pursuit of acquisitions and divestures may adversely affect our business operations or stock price if we cannot successfully execute our strategies.

We have made several acquisitions, domestically and internationally, and it is our current plan to continue to acquire assets, patents, technologies or companies that we believe are strategic to our future business. Acquisitions involve challenges in terms of successful integration of technologies, products, services and employees.

If our growth continues, it may place a significant strain on our management team and on our operational and financial systems, procedures, and controls. Our future success will depend, in part, upon the ability of our management team to manage any growth effectively, requiring our management to:

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

We may not realize the anticipated benefits of the other acquisitions we may complete in the future, and we may not be able to incorporate any acquired services, products or technologies with our existing operations, or integrate personnel from the acquired businesses, in which case our business could be harmed.

Financing for future acquisitions, may not be available on favorable terms, or at all. If we use our equity securities to fund the acquisition, it may result in significant dilution to our existing stockholders. If we identify an appropriate acquisition candidate for any of our businesses, we may not be able to negotiate the terms of the acquisition successfully, finance the acquisition or integrate the acquired business, products, service offerings, technologies or employees into our existing business and operations. Future acquisitions and divestitures may not be well-received by the investment community, which may cause the value of our stock to fall. We cannot ensure that we will be able to successfully complete any acquisition or divestiture in the future. Further, the terms of our indebtedness constrain our ability to make and finance additional acquisitions or divestitures.

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

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

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

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

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

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

- the number of radio stations broadcasting digitally using HD Radio technology;
- the willingness of automobile manufacturers to include HD Radio receivers in their vehicles;
- the willingness of manufacturers to incorporate HD Radio technology into their products;
- the cost and availability of HD Radio enabled products; and
- the marketing and pricing strategies that we employ and that are employed by our customers and retailers.

Demand for HD Radio also may be impacted by declines in the automotive industry which historically has been cyclical and experienced downturns during declining economic conditions, and which is currently experiencing declines as a result of the COVID-19 pandemic and related events.

If demand for HD Radio technology does not recover from the decline experienced in 2020 as a result of the COVID-19 pandemic and related events and return to the growth trends experienced in prior years, we may experience sustained reductions in our automotive based royalties and not meet the future growth that is currently projected.

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

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

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

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

The success of certain of our solutions depends on the interoperability of our technologies with consumer hardware devices.

To be successful, we design certain of our solutions to interoperate effectively with a variety of consumer hardware devices, including personal computers, DVD players and recorders, Blu-ray players, digital still cameras, digital camcorders, portable media players, digital TVs, home media centers, set-top boxes, video game consoles, MP3 devices, multi-media storage devices, mobile tablets and smartphones. We depend on significant cooperation with manufacturers of these devices and the components integrated into these devices, as well as software providers that create the operating systems for such devices, to incorporate certain of our technologies into their product offerings and ensure consistent playback of encoded files. Currently, a limited number of devices are designed to support certain of our technologies. If we are unsuccessful in causing component manufacturers, device manufacturers and software providers to integrate certain of our technologies into their product offerings, those technologies may become less accessible to consumers, which would adversely affect our revenue potential.

Our failure to adequately manage our increasingly complex distribution agreements, including licensing, development and engineering services, may cause unexpected delays and loss of revenue in the deployment of advanced television solutions.

In connection with our deployment arrangements for TiVo products, we engage in complex licensing, development and engineering services arrangements with our marketing partners and distributors. These deployment agreements with television service providers usually provide for some or all of the following deliverables: software engineering services, solution integration services, hosting the TiVo Service, maintenance and support. In general, these contracts are long-term and complex and often rely on the timely performance of such television service provider's third-party vendors that are outside TiVo's control. The engineering services and technology we agree to provide and/or develop may be essential to the functionality of the licensed software and delivered product or such software may involve significant customization and modification for each

customer. We have experienced in the past, and may in the future experience, delays in delivery with television service providers as well as significant increases in expected costs of development and performance in certain instances. Additional delays could lead to additional costs and adverse accounting treatments forcing us to recognize costs earlier than expected. If we are unable to deliver the contracted-for technology, including specified customizations and modifications, and services in a timely manner or at all, then we could face penalties in the form of unreimbursed engineering development work, loss of subscriber or minimum financial commitments on the part of our partners or in extreme cases the early termination of such distribution agreements. In any such case our business would be harmed.

In addition, when we enter into such deployment agreements with television service providers, we are typically required to make cost estimates based on historical experience and various other assumptions. These estimates are assessed continually during the term of the contract and revisions are reflected when the conditions become known. Using different cost estimates related to engineering services may produce materially different operating results, in addition to differences in timing and income statement classification of related expenses and revenue. An unfavorable change in estimates could result in a reduction of profit due to higher cost or the recording of a loss once such a loss becomes known to us that would be borne solely by us. We also recognize revenue for software engineering services using the percentage-of-completion method. We recognize revenue by measuring progress toward completion based on the ratio of costs incurred, principally labor, to total estimated costs of the project, an input method. If we are unable to properly measure and estimate our progress toward completion in such circumstances, we could incur unexpected additional costs, be required to recognize certain costs earlier than expected, or otherwise be required to delay recognition of revenue unexpectedly. A material inability to properly manage, estimate and perform these development and engineering services for our television service provider customers could cause us to incur unexpected losses and reduce or even eliminate any profit from these arrangements, and in such a case our business would be harmed.

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

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

For example, we have incurred, and expect to continue to incur, substantial research and development expenses through our Perceive subsidiary focused on delivering edge inference solutions. We do not have prior experience as a company in the development or marketing of similar hardware or software. We will need to continue to find and hire qualified and experienced personnel to advance this new business. In addition, chip technologies such as what we are developing are subject to extensive competition and a relentless pace of innovation. These new products could be copied or functionally surpassed by other designers, manufacturers, or innovators, some of whom may have far greater financial resources than us, and who may be able to develop products with greater capabilities or lower cost.

Our products and services could be susceptible to errors, defects, or unintended performance problems that could result in lost revenue, liability or delayed or limited market acceptance.

We develop and offer complex solutions, which we license and otherwise provide to customers. The performance of these solutions typically involves working with sophisticated software, computing and communications systems. Due to the complexity of these products and services, and despite our quality assurance testing, the products may contain undetected defects or errors that may affect the proper use or application of such products or services by the customer. Because certain of our products and services are embedded in digital content and other software, or rely on stable transmissions, our solutions' performance could unintentionally jeopardize our customers' product performance. Because customers rely on our products and services as used in their software and applications, defects or errors in our products or services may discourage customers from purchasing our products or services. These defects or errors could also result in product liability, service level agreement claims or warranty claims. Although we attempt to reduce the risk of losses resulting from these claims through warranty disclaimers and limitation of liability clauses in our agreements, these contractual provisions may not be enforceable in every instance. Any such defects, errors, or unintended performance problems in existing or new products or services, and any inability to meet customer expectations in a timely manner, could result in loss of revenue or market share, failure to achieve market acceptance,

diversion of development resources, injury to our reputation, increased insurance costs and increased service costs, any of which could materially harm our business.

Dependence on the cooperation of pay-TV service providers, television broadcasters, hardware manufacturers, data providers and delivery mechanisms could adversely affect our revenue.

We rely on third party providers to deliver our metadata to some of the CE devices that include our UXs and IPGs. Further, our national data network provides customized and localized listings for pay-TV and licensees of our data used in third party IPGs for pay-TV. In addition, we purchase certain metadata from commercial vendors that we redistribute. The quality, accuracy and timeliness of that metadata may not continue to meet our standards or be acceptable to consumers. There can be no assurance that commercial vendors will distribute data to us without error, or at all, or that the agreements that govern some of these relationships can be maintained on favorable economic terms. Technological changes may also impede the ability to distribute metadata. Our inability to renew these existing arrangements on terms that are favorable to us, or enter into alternative arrangements that allow us to effectively transmit our metadata to CE devices, could have a material adverse effect on our CE IPG business and cause our revenue or margins to decline.

We are dependent on third parties for metadata and content.

We distribute, as a revenue generating activity, metadata. In the future, we may not be able to obtain this content, or may not be able to obtain it on the same terms. Such a failure to obtain the content, or obtain it on the same terms, could damage the attractiveness of our metadata offerings to our customers, or could increase the costs associated with providing our metadata offerings, and could thus cause revenue or margins to decrease.

We depend on a limited number of third parties to design, manufacture, distribute and supply hardware devices upon which our TiVo software and service operate.

Our TiVo software and services operate on a number of hardware products, including DVR and non-DVR STBs, produced by third-party hardware companies. If we fail to effectively manage the integration of our software and services with our hardware partners' devices, we could suffer from product recalls, poorly performing product and higher than anticipated warranty costs. We have contracted for the design, manufacture and distribution of certain TiVo-branded DVRs and non-DVRs with a third-party partner. This third-party partner does not typically enter into long-term volume commitments with the major retail distributors. We currently rely on our TiVo-branded hardware partner's relationships with major retail distributors, including Best Buy, Amazon and others, for the distribution of TiVo-enabled DVRs and non-DVR products within the United States. If one or several major retail partners were to discontinue selling TiVo-enabled products, the volume of TiVo-enabled DVRs and non-DVRs sold to consumers could decrease, which could harm TiVo's service business.

We also depend on a third-party partner for certain TiVo-branded hardware devices that are sold through the TiVo website. If this third-party partner fails to perform its obligations, we may be unable to find alternative suppliers or deliver our products and services sold through the TiVo website in a timely manner or with the features and functionality customers expect. In addition, our third-party partner may depend on sole suppliers for key components and services in order to manufacture DVRs and non-DVR STBs which run our software, and they may be subject to risks of supply shortages and unexpected cost increases. Additionally, certain features and functionalities of our TiVo service and DVRs depend on third-party components and technologies. If TiVo or our third-party partner is unable to purchase or license such third-party components or technologies, we may not be able to offer certain related features and functionalities to our customers. In such a case, the desirability of our products to our customers could be reduced, thus harming our business.

We also rely on third parties to whom we outsource supply-chain activities related to inventory warehousing, order fulfillment, distribution and other direct sales logistics to provide cost-effective and efficient supply chain services. We cannot be sure that these parties will perform their obligations as expected or that any revenue, cost savings or other benefits will be derived from the efforts of these parties. If one or several of our third-party supply chain partners were to discontinue service to us, our ability to fulfill sales orders through the TiVo website and distribute inventory timely, cost-effectively, or at all, may be delayed or prevented, which could harm our business. Any of these events could require us to undertake unforeseen additional responsibilities or devote additional resources to commercialize our TiVo service. Any of these outcomes could harm our ability to compete effectively and achieve increased market acceptance and brand recognition.

We maintain inventories of TiVo-branded products based on our demand forecast, which may be incorrect and lead excess or insufficient inventory.

In connection with our sales of TiVo-branded products through the TiVo website, we maintain an inventory of certain DVR and non-DVR products based on our demand forecast. Due to the seasonality in our business and the nature of long-lead time

product development and manufacturing cycles, we make demand forecasts for these products well in advance of our peak selling periods. As such, we are subject to risks in managing the inventory needs of our business during the year, including estimating the appropriate quantity and mix of demand across our older and newer DVR and non-DVR products. Should actual market conditions differ from our estimates, our future results of operations could be materially affected. Excess purchase commitments as a result of changes in our sales forecast may require us to record a loss.

Qualifying, certifying and supporting our technologies, products and services is time-consuming and expensive.

We devote significant time and resources to qualify and support our software products on various personal computer, CE and mobile platforms, including operating systems from Apple, Google and Microsoft. In addition, we maintain high-quality standards for products that incorporate our technologies and products through a quality control certification process. To the extent that any previously qualified, certified and/or supported platform or product is modified or upgraded, or we need to qualify, certify or support a new platform or product, we could be required to expend additional engineering time and resources, which could add significantly to our development expenses and adversely affect our operating results.

We are exposed to the risks related to international sales and operations.

We derive a large portion of our total revenue from operations outside of the United States. Therefore, we face exposure to risks of operating in many foreign countries, including:

- difficulties and costs associated with complying with a wide variety of complex laws, treaties and regulations;
- unexpected changes in political or regulatory environments;
- differing employment practices, labor compliance and costs associated with a global workforce;
- earnings and cash flows that may be subject to tax withholding requirements or the imposition of tariffs;
- exchange controls or other restrictions;
- restrictions on, or difficulties and costs associated with, the repatriation of cash from foreign countries to the United States;
- political and economic instability and trade conflict;
- import and export restrictions and other trade barriers;
- difficulties in maintaining overseas subsidiaries and international operations;
- difficulties in obtaining approval for significant transactions; and
- fluctuations in foreign currency exchange rates.

Any one or more of the above factors could adversely affect our international operations and could significantly affect our results of operations, financial condition and cash flows. The results of our operations will be dependent to a large extent upon the global economy. Geopolitical factors such as terrorist activities, armed conflict or global health conditions that adversely affect the global economy may adversely affect our operating results and financial condition.

We are also subject to risks associated with compliance with applicable anti-corruption laws, including the Foreign Corrupt Practices Act (FCPA), which generally prohibits companies and their employees and intermediaries from making payments to foreign officials for the purpose of obtaining an advantage or benefits, and requires public companies to maintain accurate books and records and a system of internal accounting controls. Under these laws, companies may be held liable for actions taken by directors, officers, employees, agents, or other partners or representatives. If we or our intermediaries fail to comply with the requirements of the FCPA or similar laws, governmental authorities could seek to impose civil and criminal fines and penalties which could have a material adverse effect on our business, results of operations and financial condition.

Additionally, our business could be materially adversely affected if foreign markets do not continue to develop, if we do not receive additional orders to supply our technologies, products or services for use by international pay TV service providers, CE and STB manufacturers, PPV/VOD providers and others or if regulations governing our international businesses change. Any changes to the statutes or the regulations with respect to export of encryption technologies could require us to redesign our products or technologies or prevent us from selling and exporting our products and licensing our technologies internationally.

Further deterioration of trade relations between the United States and China, other trade conflicts and barriers, economic sanctions, and national security protection policies could limit or prevent existing or potential customers from doing business with us.

The increased trade conflicts between the United States and its major trading partners in recent years, evidenced by trade restrictions such as tariffs, taxes, export controls, economic sanctions, and enhanced policies designed to protect national security, have had and may continue to have adverse impact on our revenue if such policies continue. In particular, our

business and sales activities have been impacted due to the increase in trade conflicts between the United States and China. Further United States government actions to protect domestic economic and security interests could lead to further restrictions. Moreover, growing trade conflicts and uncertainties may lead to decreased use of foreign-owned technologies in China and other countries, due to efforts by foreign governments and enterprises to find alternative sources of supply, to develop proprietary domestic technologies, and otherwise to reduce reliance on foreign technology sources. Any such trends could have a material adverse impact on our revenue.

Our systems, networks and online business activities are subject to cybersecurity and stability risks, information technology system failures, and security breaches.

Despite our provisions for system redundancy and the implementation of security measures within our internal and external information technology and networking systems, our information technology systems may be subject to security breaches, unauthorized access (malicious or accidental), misuse of information by authorized users, data leaks or unintentional exposure of information, failed processes or other bugs, loss of data, damages from computer viruses or malware, natural disasters, terrorism, telecommunication failures or disruption of service. In addition, our online business activities depend on the ability to store and transmit confidential information and licensed intellectual property securely on our systems, third party systems and over private, hybrid and public networks. Any compromise of our ability to store or transmit such information and data securely or reliably, and any costs associated with preventing or eliminating such problems, could harm our business. Our storage and online transmissions and business activities are subject to a number of security and stability risks, including:

- our own or licensed encryption and authentication technology, or access or security procedures, may be compromised, breached or otherwise be insufficient to ensure the security of customer information or intellectual property;
- we could experience unauthorized access, computer viruses, system interference or destruction, “denial of service” attacks and other disruptive problems, whether intentional or accidental, that may inhibit or prevent access to our websites and infrastructure or use of our products and services, or cause customer information or other sensitive information to be disclosed to a perpetrator, others or the general public;
- someone could circumvent our security measures and misappropriate our, our business relations or our customers' proprietary information or content, interrupt operations, or jeopardize our licensing arrangements, many of which are contingent on our sustaining appropriate security protections;
- our computer systems could fail and lead to service interruptions or downtime for television or other guidance systems, or websites, which may include e-commerce websites;
- we could inadvertently disclose customer information; or
- we may need to grow, reconfigure or relocate our data centers in response to changing business needs, which may be costly and lead to unplanned disruptions of service.

The occurrence of any of these or similar events could damage our business, hurt our ability to distribute products and services and collect revenue, threaten the proprietary or confidential nature of our technology, harm our reputation, increase the costs of our ongoing cybersecurity protections and enhancements, and expose us to litigation and other liabilities. Because some of our technologies and businesses are intended to inhibit use of or restrict access to our customers' intellectual property, we may become the target of hackers or other persons whose use of or access to our customers' intellectual property is affected by our technologies. Also, hackers may, for financial gain or other motives, seek to infiltrate or damage our systems, or obtain sensitive business information or customer information. We also may be exposed to customer claims, or other liability, in connection with any security breach or inadvertent disclosure. We may be required to expend significant capital or other resources to protect against the threat of security breaches, hacker attacks or system malfunctions or to alleviate problems caused by such breaches, attacks or failures. For example, we utilize SolarWinds for network device management. SolarWinds announced in December 2020 that its system was infected with malicious software during 2020, which might have impacted its customers. We implemented software patches and other security measures recommended by SolarWinds and other security experts in connection with this matter. While we do not believe we were targeted by malicious actors through the SolarWinds system, and we found no evidence that any of our information was exfiltrated from our systems, there is no guarantee that future hacks and attacks on the network will be unsuccessful or resolved without damage to us or our customers.

Our product and service offerings rely on a variety of systems, networks and databases, many of which are maintained by us at our data centers or third-party data centers (e.g., cloud services). We do not have complete redundancy for all of our systems, and we do not maintain real-time back-up of our data, so in the event of significant system disruption, particularly during peak periods, we could experience loss of data processing capabilities, which could prevent us from providing our products and services to our customers for an uncertain amount of time, cause us to lose customers as a result of such breaches, and could harm our operating results through loss of revenue and increased costs to remediate such cybersecurity incidents. Notwithstanding our efforts to protect against “down time” for products and services, we do occasionally experience unplanned outages or technical difficulties. In order to provide products and services, we must protect the security of our systems, networks, databases and software.

To the extent that any disruption or security breach results in inappropriate disclosure of our confidential information, we may incur liability or additional costs to remedy the damages caused by these disruptions or security breaches.

Risks Related to Financial Matters

The nature of our business requires the application of complex accounting principles. Significant changes in U.S. generally accepted accounting principles ("GAAP") could materially affect our financial position and results of operations.

From time to time the Financial Accounting Standards Board (the "FASB") modifies the accounting standards applicable to our financial statements, which could materially affect our financial position or results of operations. For example, in February 2016, the FASB issued an amended accounting standard for leases, Accounting Standards Update No. 2016-02, Leases ("Topic 842"). On January 1, 2019, Xperi and TiVo each adopted Topic 842. As a result of adopting Topic 842, we recognized combined present value of existing minimum lease payments as lease liabilities of $99.5 million and corresponding right-of-use assets of $85.5 million as of January 1, 2019.

We have significant indebtedness which could adversely affect our financial position.

As of December 31, 2020, we had $873.8 million of total debt outstanding under our 2020 Term Loan B Facility. Our 2020 Term Loan B Facility is guaranteed by us and our wholly-owned material domestic subsidiaries and is secured by substantially all of our and the subsidiary guarantors' assets. Our indebtedness may:

- limit our ability to borrow additional funds for working capital, capital expenditures, acquisitions or other general business purposes;
- limit our ability to use our cash flow or obtain additional financing for future working capital, capital expenditures, acquisitions or other general business purposes;
- require us to use a substantial portion of our cash flow from operations to make debt service payments;
- limit our flexibility to plan for, or react to, changes in our business and industry;
- place us at a competitive disadvantage compared to our less leveraged competitors; and
- increase our vulnerability to the impact of adverse economic and industry conditions.

Our ability to meet our debt service obligations will depend on our future performance, which will be subject to financial, business and other factors affecting our operations, many of which are beyond our control.

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

As of December 31, 2020, we had $873.8 million of outstanding indebtedness that was subject to floating interest rates. Changes in economic conditions outside of our control could result in higher interest rates, thereby increasing our interest expense and reducing the funds available for capital investment, operations or other purposes. At December 31, 2020, a 1% increase in the effective interest rate on our outstanding debt throughout a one-year period would result in an annual increase in our interest expense of approximately $8.7 million. Any significant increase in our interest expense could negatively impact our results of operations and cash flows and also our ability to pay dividends in the future. If the U.S. Federal Reserve raises its benchmark interest rate, any increases would likely impact the borrowing rate on our outstanding indebtedness and increase our interest expense.

We may not be able to generate sufficient cash to service our debt obligations.

Our ability to make payments on and to refinance our indebtedness will depend on our financial and operating performance, which is subject to prevailing economic and competitive conditions and to certain financial, business and other factors beyond our control. We may be unable to maintain a level of cash flows from operating activities sufficient to permit us to pay the principal and interest on our indebtedness when due.

If our cash flows and capital resources are insufficient to timely fund our debt service obligations, we may be forced to reduce or delay investments and capital expenditures, or to sell assets, seek additional capital or restructure or refinance our indebtedness. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. In the absence of cash flows and capital resources, we could face substantial liquidity problems and might be required to dispose of material assets or operations to meet our debt service and other obligations. Our Credit Agreement restricts our ability to dispose of assets, use the proceeds from any disposition of assets and refinance our indebtedness. We may not be able to consummate those dispositions or to maximize the proceeds that we could realize from them and these proceeds may not be adequate to meet any debt service obligations then due.

Repayment of debt is dependent on cash flow generated by our subsidiaries and their respective subsidiaries.

Our subsidiaries own a significant portion of our assets and conduct substantially all of our operations. Each subsidiary is a distinct legal entity, and, under certain circumstances, legal and contractual restrictions may limit our ability to obtain cash from our subsidiaries. Our subsidiaries may not be able to, or may not be permitted to, make distributions to enable us to make payments in respect of our indebtedness. Additionally, distributions from our non-U.S. subsidiaries may be subject to foreign withholding taxes and would be subject to U.S. federal and state income tax which could reduce the net cash available for principal and interest payments.

We utilize non-GAAP reporting in our quarterly earnings press releases.

As part of our quarterly earnings press releases, we publish measures compiled in accordance with GAAP as well as non-GAAP financial measures, along with a reconciliation between the GAAP and non-GAAP financial measures. The reconciling items adjust amounts reported in accordance with GAAP for certain items which are described in detail in each such quarterly earnings press release. We believe that our non-GAAP financial measures are meaningful to investors when analyzing our results of operations as this is how our business is managed. The market price of our stock may fluctuate based on future non-GAAP results if investors base their investment decisions on such non-GAAP financial measures. If we decide to alter or curtail the use of non-GAAP financial measures in our quarterly earnings press releases, the market price of our stock could be adversely affected if investors analyze our performance in a different manner.

If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements could be impaired, which could increase our operating costs and affect our ability to operate our business.

We have a complex business that is international in scope. Ensuring that we have adequate internal controls and procedures in place to facilitate the production of accurate financial statements on a timely basis is a costly and time-consuming effort that needs to be re-evaluated frequently. We are continually in the process of documenting, reviewing and, if appropriate, improving our internal controls and procedures in connection with Section 404 of the Sarbanes-Oxley Act of 2002, which requires annual management assessments of the effectiveness of our internal control over financial reporting and a report by our independent registered public accountants on the effectiveness of our internal control over financial reporting. If we identify areas for further attention or improvement, implementing any appropriate changes to our internal controls may require specific compliance training of our directors, officers and employees, entail substantial costs in order to modify our existing accounting systems and take a significant amount of time to complete. We have in the past identified, and may in the future identify, significant deficiencies in the design and operation of our internal controls, which have been or will in the future need to be remediated. In addition, we have identified material weaknesses in our internal control over financial reporting in connection with the audit of our consolidated financial statement for the fiscal year ended December 31, 2020. See "Risk Factors—We have identified material weaknesses in our internal control over financial reporting which could, if not remediated, adversely affect our ability to report our financial and operating results accurately or on a timely basis, and impact overall investor confidence and the value of our common stock." Finally, in the event we make another significant acquisition, such as the merger with TiVo, or a series of smaller acquisitions, we may face significant challenges in implementing the required processes and procedures in the acquired operations. This could result in an adverse reaction in the financial markets due to investors' perceptions that our internal controls are inadequate or that we are unable to produce accurate financial statements.

We have identified material weaknesses in our internal control over financial reporting which could, if not remediated, adversely affect our ability to report our financial and operating results accurately or on a timely basis, and impact overall investor confidence and the value of our common stock.

In connection with the audit of our consolidated financial statements as of and for the year ended December 31, 2020, we identified material weaknesses in our internal control over financial reporting relating to the design and operation of controls to review forecast assumptions used in the determination of fair value of intangible assets acquired through business combinations and in the testing of goodwill impairment. Although the material weaknesses did not result in a material misstatement to our consolidated financial statements as of and for the year ended December 31, 2020, as a result of these material weaknesses, we concluded that internal controls over financial reporting were not effective as of December 31, 2020.

With the oversight from our Audit Committee, we are in the process of developing and implementing remediation plans in response to the identified material weaknesses. The specific material weaknesses and our remediation efforts are described in Item 9A of this annual report. There can be no assurance as to when the remediation plan will be fully implemented or whether the remediation efforts will be successful. As we continue to evaluate and work to improve our internal controls, we may take additional measures to address the material weaknesses or modify our remediation plan.

Until the remediation plan is fully implemented, we will continue to devote time and attention to these efforts. If the remediation of the material weaknesses is not completed in a timely fashion, or at all, or if the plan is inadequate, there will be an increased risk that we may be unable to timely file future periodic reports with the SEC and that future consolidated financial statements could contain errors that will be undetected. The existence of material weaknesses in the effectiveness of our internal controls could also affect our ability to obtain financing or could increase the cost of any such financing. The identification of the material weaknesses could also cause investors to lose confidence in the reliability of the Company's financial statements and could result in a decline in the value of our common stock.

If our goodwill and other intangible assets become impaired, we may be required to record a significant charge to earnings.

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

Changes in, or interpretations of, tax rules and regulations, could adversely affect our effective tax rates and negatively affect our business and financial condition.

We are subject to U.S. federal and state income taxes, as well as taxes in various international jurisdictions. As a result, our effective tax rate is derived from a combination of applicable tax rates in the various jurisdictions where we operate. In preparing our financial statements, we estimate the amount of tax to accrue in each tax jurisdiction. Nevertheless, our effective tax rate may be different than experienced in the past due to numerous factors, including from the passage of new tax laws, changes in the mix of our profitability from state to state and from country to country, the amount of payments from the company's U.S. entities to related foreign entities, the results of examinations and audits of our tax filings, our inability to secure or sustain acceptable agreements with tax authorities and changes in accounting for income taxes. Our future effective tax rates could be unfavorably affected by changes in tax rates, tax laws or the interpretation of tax laws, by changes in the amount of pre-tax income derived from countries with high statutory income tax rates, or by changes in our deferred tax assets and liabilities, including changes in our ability to realize our deferred tax assets. Our effective income tax rate could be unfavorably affected by changes in the amount of sales to customers in countries with high withholding tax rates. Any of these factors could cause us to experience an effective tax rate significantly different from previous periods or our current expectations and may result in tax obligations in excess of amounts accrued in our financial statements.

In addition, U.S. federal, U.S. state, and foreign tax jurisdictions may examine our income tax returns, including income tax returns of acquired companies and acquired tax attributes included therein. We regularly assess the likelihood of outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. In making such assessments, we exercise judgment in estimating our provision for income taxes. While we believe our estimates are reasonable, we cannot assure you that the final determination from these examinations will not be materially different from that reflected in our historical income tax provisions and accruals. Any adverse outcome from these examinations may have a material adverse effect on our business and operating results.

Our ability to use net operating losses to offset future taxable income may be subject to limitations.

As of December 31, 2020, we have U.S. federal and state net operating losses of approximately $0.5 billion and $1.1 billion (post-apportioned). A portion of the federal and state net operating loss carryforwards will begin to expire, if not utilized, in 2020. Net operating losses that expire unused will be unavailable to offset future income tax liabilities. Under the Tax Cuts and Jobs Act, federal net operating losses incurred in 2018 and in future years may be carried forward indefinitely, but the deductibility of such federal net operating losses is limited. In addition, under Sections 382 and 383 of the Internal Revenue Code (the "Code") and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than fifty-percent (50%) change, by value, in its equity ownership over a three (3)-year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be limited. We may experience ownership changes in the future as a result of subsequent

shifts in our stock ownership, some of which may be outside of our control. If an ownership change occurs and our ability to utilize our net operating loss carryforwards is materially limited, it would harm our future operating results by effectively increasing our future tax obligations. In addition, at the state level, there may be periods during which the use of net operating loss carryforwards is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed by us.

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

Our international corporate structure and intercompany arrangements, including the manner in which we market, develop, use and license our intellectual property, fund our operations and structure transactions with our international subsidiaries, may result in the increase or reduction of our worldwide effective tax rate. Such international corporate structure and intercompany arrangements are subject to examination by the tax authorities of the jurisdictions in which we operate, including the United States. The application of the tax laws of these jurisdictions to our international business activities is subject to interpretation and depends on our ability to operate our business in a manner consistent with our corporate structure and intercompany arrangements. Moreover, such tax laws are subject to change. Tax authorities may disagree with our intercompany transfer pricing arrangements, including our transfer of intangibles, or determine that the manner in which we operate our business does not achieve the intended tax consequences. Additionally, current and future changes in the tax laws or interpretations may have an adverse effect on our international corporate structure and operations. For example, various levels of government and international organizations, such as the Organization for Economic Co-operation and Development (OECD) and the European Union ("EU"), increasingly focus on future tax reform that could change longstanding tax principles. Changes in the Korean tax law on royalties subject to withholding taxes from our Korean licensees may impact our financial results. Foreign countries have enacted or are contemplating legislation which imposes a digital services tax directly on a service provider which exceeds various revenue thresholds. The result of an adverse determination of any of the above items could increase our worldwide effective tax rate and harm our financial position and results of operations.

If we fail to comply with the laws and regulations relating to the collection of sales tax and payment of income taxes in the various states and foreign jurisdictions in which we do business, we could be exposed to unexpected costs, expenses, penalties and fees as a result of our noncompliance in which case our business could be harmed.

As our business grows and expands, we have started to do business in an increasing number of states nationally and foreign jurisdictions. By engaging in business activities in these states and foreign jurisdictions, we become subject to their various laws and regulations, including possible requirements to collect sales tax from our sales within those states and foreign jurisdictions and the payment of income taxes on revenue generated from activities in those states and foreign jurisdictions. In addition, TiVo collects and remits sales taxes in numerous states. The laws and regulations governing the collection of sales tax and payment of income taxes are numerous, complex, and vary among states and foreign jurisdictions. If we fail to comply with these laws and regulations requiring the collection of sales tax and payment of income taxes in one or more states and foreign jurisdictions where we do business, we could be subject to significant costs, expenses, penalties and fees in which case our business would be harmed.

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

The need for a valuation allowance requires an assessment of both positive and negative evidence on a jurisdiction-by-jurisdiction basis when determining whether it is more-likely-than-not that deferred tax assets are recoverable. In making such assessment, significant weight is given to evidence that can be objectively verified. New facts and circumstances, historic profits or losses, and future financial results may require us to reevaluate our valuation allowance positions which could potentially affect our effective tax rate.

We continue to monitor the likelihood that we will be able to recover our deferred tax assets, including those for which a valuation allowance is recorded. There can be no assurance that we will generate profits in future periods enabling us to fully realize our deferred tax assets. As a result of the merger between Xperi Corporation and TiVo, we have applied a valuation allowance on U.S. Federal, and many U.S. state, and foreign deferred tax assets to the extent they are not realizable by utilizing deferred tax liabilities as sources of income. The timing of recording a valuation allowance or the reversal of such valuation allowance is subject to objective factors that cannot be readily predicted in advance. Both the establishment of a valuation allowance and the reversal of a previously recorded valuation allowance may have a material impact on our financial results.

The IRS may assert positions that may negatively impact the tax-free status of distributions intended to qualify for tax-free treatment, and the desired benefits of such distributions may not be achieved.

In general, a corporation, which we refer to as the distributing corporation, that distributes the stock of another corporation, which we refer to as the controlled corporation, in a transaction that would otherwise qualify for tax-free treatment under Section 355 of the Code may be required to recognize corporate-level gain on the distribution if there is an acquisition of a 50% or greater interest (within the meaning of Section 355(d)(4) of the Code) in either the distributing corporation or the controlled corporation as part of a plan including the distribution. Although there is no current approved plan to separate any parts of the combined company, we currently contemplate that, at some point, likely no earlier than the second half of 2022, we may pursue, subject to any required regulatory approvals, a separation of our product business and IP licensing business in a transaction intended to qualify as tax-free under Section 355 of the Code, resulting in two independent publicly traded companies. This separation, if undertaken, would be achieved through a pro-rata spin-off transaction in which our stockholders, at such time, would receive shares of capital stock in the resulting spun-off company. It is expected that Xperi and TiVo would be able to minimize any corporate-level gain on such separation transaction in connection with our formation, because there would be no acquisition of a 50% or greater interest in either company. There can be no assurance, however, that the IRS may not take a contrary view. In addition, in the event that the IRS were to take the view that the transactions that led to our formation constitute an acquisition of a 50% or greater interest in either Xperi or TiVo, we may be restricted in our ability to implement any contemplated business separation in a tax-efficient manner. Certain steps we take in contemplation of the separation could result in the reduction of certain tax attributes or the payment of cash taxes even if we satisfy the requirements under Section 355(d)(4).

Additionally, there are many factors that could impact the structure or timing of, the anticipated benefits from, or determination to ultimately proceed with, any contemplated business separation, including, among others, global economic conditions, instability in credit markets, declining consumer and business confidence, fluctuating commodity prices and interest rates, volatile exchange rates, tax considerations, and other challenges that could affect the global economy, specific market conditions in one or more of the industries of the businesses proposed to be separated, and changes in the regulatory or legal environment. Such changes could adversely impact the value of a contemplated business separation transaction to our stockholders.

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

At December 31, 2020, we held approximately $170.2 million in cash and cash equivalents and $86.9 million in short-term investments. These investments include various financial securities such as corporate bonds and notes, municipal bonds and notes, commercial paper, treasury and agency notes and bills, and money market funds. Although we invest in high quality securities, ongoing financial events have at times adversely impacted the general credit, liquidity, market and interest rates for these and other types of debt securities. Recent financial market volatility resulting from the COVID-19 pandemic heightens the risk of a potential loss in the value of our investments. Changes in monetary policy by the Federal Reserve, government fiscal policies, and global economic and market conditions may adversely affect the value of our investment portfolio. We may in the future have a need to sell investments before their maturity dates, which could result in losses on the sale of those investments. The financial market and monetary risks associated with our investment portfolio have and may in the future have a material adverse effect on our financial condition, results of operations or cash flows.

Risks Related to Regulatory and Legal Matters

New governmental regulations or new interpretations of existing laws, including legislative initiatives seeking to, or judicial or regulatory decisions that, weaken patent protection or copyright law, could cause legal uncertainties and result in harm to our business.

Our business relies in part on the uniform and historically consistent application of U.S. patent laws, rules, and regulations. The standards that courts use to interpret patents are not always applied predictably or uniformly and may evolve, particularly as new technologies develop. For example, the Supreme Court of the United States has modified some legal standards applied by the U.S. Patent and Trademark Office in the examination of U.S. patent applications, which may decrease the likelihood that we will be able to obtain patents and may increase the likelihood of challenges to patents we obtain or license. For example, our patents continue to face challenges in the U.S. from Inter Partes Review (IPR) proceeding before the Patent Trial and Appeal Board (PTAB). Such proceedings to date have a high rate of invalidation of patents and patents we have asserted in litigation have been and may continue to be invalidated in such proceedings. Additionally, there have been and may be bills introduced in the U.S. Congress relating to patent law that could adversely impact our business depending on the scope of any bills that may ultimately be enacted into law. Some of these changes or potential changes may not be advantageous for us and may make it more difficult to obtain adequate patent protection, or to enforce our patents against parties using them without a license or payment of royalties. These changes or potential changes could increase the costs and uncertainties surrounding the prosecution of our patent applications and the enforcement of our patent rights and could have a negative effect on our ability to license our patents and, therefore, on the royalties we can collect.

Consumer rights advocates and other constituencies also continuously challenge copyright law through both legislative and judicial actions. If our copyright protections are compromised, or devices that can circumvent our technology are permitted by law and become prevalent, this could result in reduced demand for our technologies, and our business would be harmed.

Many laws and regulations are pending and may be adopted by the U.S. federal government, individual states and local jurisdictions and other countries with respect to the internet. These laws may relate to many areas that impact our business, including intellectual property rights, digital rights management, copyright, property ownership, privacy, taxation, and the consumer electronic ("CE") and television industry. These types of regulations are likely to differ between countries and other political and geographic divisions. Changes to or the interpretation of these laws could increase our costs, expose us to increased litigation risk, substantial defense costs and other liabilities or require us or our customers to change business practices. Laws or regulations could be interpreted to prevent or limit access to some or all television signals by certain CE devices, or impose limits on the number of copies, the ability to transfer or move copies, or the length of time a consumer may retain copies of some or all types of television programming.

In addition, the satellite transmission, cable and telecommunications industries are subject to pervasive federal regulation, including Federal Communications Commission ("FCC") licensing and other requirements, as well as extensive regulation by local and state authorities. The FCC could promulgate new regulations or interpret existing regulations in a manner that would cause us to incur significant compliance costs or force us to alter or eliminate certain features or functionality of our products or services, which may adversely affect our business. For example, the FCC could determine that certain of our products fail to comply with regulations concerning matters such as electrical interference, copy protection, digital tuners, accessibility for blind and deaf users, or display of television programming based on rating systems.

In the United States, the FCC regulates the broadcast radio industry, interprets laws enacted by Congress and establishes and enforces regulations governing radio broadcasting. It is unclear what rules and regulations the FCC may adopt regarding digital audio broadcasting and what effect, if any, such rules and regulations will have on our product licensing business, the operations of stations using our HD Radio technology or consumer electronics manufacturers. Any additional rules and regulations imposed on digital audio broadcasting could adversely impact the attractiveness of HD Radio technology and negatively impact our business. Also, non-compliance by us, or by radio stations offering HD Radio broadcasts, with any FCC requirements or conditions could result in fines, additional license conditions, license revocation or other detrimental FCC actions.

It is difficult to anticipate the impact of current or future laws and regulations on our business. We may have significant expenses associated with staying appraised of and in compliance with local, state, federal, and international legislation and regulation of our business and in presenting the Company's positions on proposed laws and regulations.

We need to safeguard the security and privacy of our customers' confidential data and remain in compliance with laws that govern such data, and any inability to do so may harm our reputation and brand and expose us to legal action.

Our products and services and back-end information technology systems can collect and allow us to store individual viewer and account preferences and other data our customers may consider confidential or may be considered personal information or personal data under applicable regulatory schemes. To provide better consumer experiences and to operate effectively, and for our analytics business and other businesses, we collect certain information from users. Collection and use of such information may be subject to U.S. federal and state privacy and data collection laws and regulations, standards used by credit card companies applicable to merchants processing credit card details, and foreign laws. We may also be subject to third party privacy policies and permissions and obligations we owe to third parties, including, for example, those of pay TV service providers. We post our privacy policies concerning the collection, use and disclosure of user data, including interactions between client and server. Privacy concerns, however, could create uncertainty in the marketplace for digital video recording and for our products and services more generally. Any failure by us to comply with privacy policies or contractual obligations, any failure to comply with standards set by credit card companies relating to privacy or data collection, any failure to conform the privacy policy to changing aspects of our business or applicable law, or any existing or new legislation regarding privacy issues could impact our data collection efforts and subject us to fines, litigation or other liability.

Further, our compliance with such laws dealing with the use, collection and processing of such customer data, including personal data, is core to our strategy. These laws are increasing in number, enforcement, fines and other penalties. All states have adopted laws requiring notice to consumers of a security breach implicating their personal information. In the event of a security breach, these laws may subject us to incident response, notice and remediation costs, as well as costs associated with any investigations that might arise from federal regulatory agencies and state attorneys general. Failure to safeguard data adequately or to destroy data securely could subject us to regulatory investigations or enforcement actions under federal or state data security, unfair practices, or consumer protection laws. The scope and interpretation of these laws could change and the

associated burdens and compliance costs could increase in the future. Two such governmental regulations that have significant implications for our products and services are the General Data Protection Regulation (“GDPR”) and the California Consumer Privacy Act (“CCPA”).

Compliance with these and any other applicable privacy and data security laws and regulations is a rigorous and time-intensive process, and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. If we fail to comply with any such laws or regulations, we may face significant fines and penalties that could adversely affect our business, financial condition and results of operations, and could damage and harm our reputation. Furthermore, the laws are not consistent among various international and state jurisdictions, and compliance in the event of a widespread data breach is costly.

In addition, the Children's Online Privacy Protection Act imposes civil and criminal penalties on persons collecting personal information from children under the age of 13. We do not knowingly distribute harmful materials to minors, direct our websites or services to children under the age of 13, or collect personal information from children under the age of 13. However, we are not able to control the ways in which consumers use our technology, and our technology may be used for purposes that violate this or other similar laws. The manner in which such laws may be interpreted and enforced cannot be fully determined, and future legislation could subject us to liability if we were deemed to be non-compliant.

Further, if our technological security measures are compromised, our customers may curtail or stop use of our products and services. Our products and services such as DVRs may contain the private information of our customers, and security breaches could expose us to a risk of loss of this information, which could result in potential liability and litigation.

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

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

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

Our activities to advertise, market and sell our services directly to consumers are highly regulated by constantly evolving state and federal laws and regulations.

We engage in various advertising, marketing and other promotional activities. For instance, in the past, we have offered gift subscriptions and mail-in-rebates to consumers, which are subject to state and federal laws and regulations. A constantly evolving network of state and federal laws is increasingly regulating these promotional activities. Additionally, we enter into subscription service contracts directly with consumers which govern both our provision of and the consumers' payment for the TiVo service. For example, consumers who activate new monthly subscriptions to the TiVo service may be required to commit to pay for the TiVo service for a minimum of one year or be subject to an early termination fee if they terminate prior to the expiration of their commitment period. If the terms of our subscription service contracts with consumers, such as our imposition of an early termination fee, or our previously offered rebate or gift subscription programs were to violate state or federal laws or regulations, we could be subject to suit, penalties, enforcement actions, and/or negative publicity in which case our business would be harmed.

Some software we provide may be subject to “open source” licenses, which may restrict how we use or distribute our software or require that we release the source code of certain products subject to those licenses.

Some of the products we support and some of our proprietary technologies incorporate open source software such as open source codecs that may be subject to the Lesser Gnu Public License or other open source licenses. The Lesser Gnu Public License and other open source licenses may require that source code subject to the license be released or made available to the public. Such open source licenses may mandate that software developed based on source code that is subject to the open source license, or combined in specific ways with such open source software, become subject to the open source license. We take steps to ensure that proprietary software we do not wish to disclose is not combined with, or does not incorporate, open source software in ways that would require such proprietary software to be subject to an open source license. However, few courts have interpreted the Lesser Gnu Public License or other open source licenses, and the manner in which these licenses may be interpreted and enforced is therefore subject to some uncertainty. We often take steps to disclose source code for which

disclosure is required under an open source license, but it is possible that we have or will make mistakes in doing so, which could negatively impact our brand or our adoption in the community, or could expose us to additional liability. In addition, we rely on multiple software programmers to design our proprietary products and technologies. Although we take steps to ensure that our programmers (both internal and outsourced) do not include open source software in products and technologies we intend to keep proprietary, we cannot be certain that open source software is not incorporated into products and technologies we intend to keep proprietary. In the event that portions of our proprietary technology are determined to be subject to an open source license, or are intentionally released under an open source license, we could be required to publicly release the relevant portions of our source code, which could reduce or eliminate our ability to commercialize our products and technologies. Also, in relying on multiple software programmers to design products and technologies that we ultimately end up releasing in the open source community, we may discover that one or multiple such programmers have included code or language that would be embarrassing to us, which could negatively impact our brand or our adoption in the community, or could expose us to additional liability. Such additional liability could include claims that result in litigation, require us to seek licenses from third-parties in order to keep offering our software, require us to re-engineer our software, require us to release proprietary source code, require us to provide indemnification or otherwise subject us to liability to a customer or supplier, or require us to discontinue the sale of a product in the event re-engineering cannot be accomplished in a timely manner, any of which could adversely affect our business.

Risks relating to Ownership of our Common Stock

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

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

- the timing of, and compliance with license or service agreements and the terms and conditions for payment to us of license or service fees under these agreements;
- fluctuations in our royalties caused by the pricing terms of certain of our license agreements;
- the amount of our product and service revenue;
- changes in the level of our operating expenses;
- the substantial research and development expenses that we have made and will continue to make on new products, as well as the uncertainty that such products will generate material revenue for the Company;
- delays in our introduction of new technologies or market acceptance of these new technologies through new license agreements;
- our ability to protect or enforce our intellectual property rights or the terms of our agreements;
- legal proceedings affecting our patents, patent applications or license agreements;
- the timing of the introduction by others of competing technologies and the extent to which new technologies replace technologies to which our solutions are targeted;
- changes in demand for semiconductor chips in the specific end markets in which we concentrate;
- changes in demand for camera-enabled devices including cell phones, security systems and personal computers;
- the timing of establishing new licensing arrangements and concluding older license agreements;
- the pace at which our older product sales decline compared to the pace at which our new product revenue grows;
- meeting the requirements for revenue recognition under generally accepted accounting principles;
- changes in generally accepted accounting principles including new accounting standards which may materially affect our revenue recognition and the comparability between revenue recognition and cash flow from customer royalties;
- cyclical fluctuations in semiconductor and consumer electronics markets generally;
- our ability to execute and complete successfully the contemplated separation transaction;
- expenses related to and the financial impact of possible acquisitions of other businesses and the integration of such businesses;
- expenses related to and the financial impact of the disposition of businesses, including post-closing indemnification obligations; and
- adverse changes in the level of economic activity in the U.S. or other major economies in which we do business as a result of the threat of terrorism, military actions taken by the U.S. or its allies, civil unrest, pandemics, natural disasters or generally weak and uncertain economic and industry conditions.

Due to fluctuations in our operating results, reports from market and security analysts, litigation-related developments, and other factors including general market conditions, the price at which our common stock will trade is likely to continue to be

highly volatile. In future periods, if our revenue, royalties, cash flows or operating results are below the estimates or expectations of public market analysts and investors, our stock price could decline.

Seasonal trends may cause our quarterly operating results to fluctuate and our inability to forecast these trends may adversely affect the market price of our common stock.

Although predicting consumer demand for our products is very difficult, new consumer subscriptions for products and services, such as TiVo Service have traditionally been higher during and immediately after the Christmas holiday shopping season than during other times of the year. If we are unable to accurately forecast and respond to consumer demand for our products, our reputation and brand will suffer and the market price of our common stock would likely fall.

We may not pay dividends or pay dividends at a consistent rate, and any decrease in or suspension of the dividend could cause our stock price to decline.

We anticipate that all dividends and stock repurchases will be paid out of our cash, cash equivalents and short-term investments. The payment of future cash dividends is subject to the final determination by our Board of Directors based on a number of factors, including our earnings, financial condition, actual and forecasted cash flows, capital resources and capital requirements, alternative uses of capital including business combinations, economic condition and other factors considered relevant by management and the Board of Directors. Since July 2020, the Board has declared quarterly cash dividends of $0.05 per share, which reflects a reduction from Xperi's historical quarterly dividend of $0.20 per share, and such reduction was primarily based on revised capital allocation strategy following the Mergers. Any decrease in the amount of the dividend, or suspension or discontinuance of payment of a dividend, could cause our stock price to decline.

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

In June 2020, our Board of Directors authorized a stock repurchase program to repurchase up to $150 million of our outstanding shares of common stock dependent on market conditions, share price and other factors. As of December 31, 2020, the total amount available for repurchase under the plan was $79.9 million. The amount of repurchases under our stock repurchase program will vary. The timing of repurchases is at our discretion and the program may be suspended or discontinued at any time. Any suspension or discontinuation could cause the market price of our stock to decline. The timing of repurchases pursuant to our stock repurchase program could affect our stock price and increase its volatility. There can be no assurance that any stock repurchases will enhance stockholder value because the market price of our common stock may decline below the levels at which we effected repurchases. Furthermore, we may engage in mergers, acquisitions, or other activity that could result in us reducing or discontinuing share repurchases for a period of time. Finally, the terms of our current or future debt agreements could limit our ability to repurchase shares.

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

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

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

We have historically used stock options, restricted stock grants and other forms of stock-based compensation as key components of employee compensation in order to align employees' interests with the interests of our stockholders, encourage employee retention and provide competitive compensation and benefit packages. We incur significant compensation costs associated with our stock-based compensation programs. Failure to obtain stockholder approval of equity compensation plans or changes to the plans could make it harder or more expensive for us to grant stock-based compensation to employees in the

future. As a result, we may find it difficult to attract, retain and motivate employees, and any such difficulty could have a materially adverse impact on our business.

Use of our common stock for future acquisitions may be limited.

Our ability to use common stock for future acquisitions without triggering an ownership change for the purposes of Sections 382 and 383 of the Code will likely be limited for three (3) years following the Mergers. To the extent that we are unable to use our common stock to make future acquisitions, our ability to grow through acquisitions may be limited by the extent to which we are able to raise capital through debt, equity financings or operational growth. Reliance on internally generated cash or debt to complete acquisitions could substantially limit our operational and financial flexibility. If we are unable to obtain additional capital on acceptable terms, we may be required to reduce the scope of any expansion or redirect resources committed to internal purposes. Inability to use our common stock in acquisitions may hinder our ability to actively make future acquisitions and recruit talent through acquisitions and restricts the flexibility in which we can make acquisition bids.

Stock transfer restrictions in our certificate of incorporation may act as an anti-takeover device.

Our certificate of incorporation includes certain transfer restrictions intended to preserve certain of our tax attributes. Such transfer restrictions will apply to future transfers made by 4.91% stockholders, transferees related to a 4.91% stockholder, transferees acting in coordination with a 4.91% stockholder, or transfers that would result in a stockholder becoming a 4.91% stockholder in order to avoid potential limitation of such tax attributes pursuant to Section 382 of the Code. Such transfer restrictions will expire on the earlier of (i) the repeal of Section 382 or any successor statute if our board of directors determines that such restrictions are no longer necessary or desirable for the preservation of certain tax benefits, (ii) the beginning of a taxable year to which our board of directors determines that no tax benefits may be carried forward, (iii) the third anniversary of the Mergers, or (iv) such other date as our board of directors shall fix in accordance with the certificate of incorporation.

The transfer restrictions described above could make it more difficult for a third party to acquire, or could discourage a third party from acquiring, a large block of our common stock. This may adversely affect the marketability of our common stock by discouraging existing or potential investors from acquiring our stock or additional shares of our stock. It is also possible that the transfer restrictions could delay or frustrate the removal of incumbent directors and could make more difficult a merger, tender offer or proxy contest involving us, or impede an attempt to acquire a significant or controlling interest in us, even if such events might be beneficial to us and our stockholders.

Our amended and restated certificate of incorporation contains forum limitations for certain disputes between us and our stockholders that could limit the ability of stockholders to bring claims against us and our directors, officers and employees in jurisdictions preferred by stockholders.

Our charter provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware is the sole and exclusive forum for (i) any derivative lawsuit brought on our stockholders, (ii) any lawsuit against our current or former directors, officers, employees, stockholders or agents asserting a breach of a duty (including any fiduciary duty) owed by any such current or former director, officer, stockholder, employee or agent to us or our stockholders, (iii) any lawsuit asserting a claim against us or any of our current or former director, officer, employee, stockholder or agent arising out of or relating to any provision of the DGCL, our charter or our bylaws (each, as in effect from time to time), or (iv) any lawsuit asserting a claim against us or any of our current or former director, officer, employee, stockholder or agent governed by the internal affairs doctrine of the State of Delaware. Our charter also provides that, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States of America are the sole and exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. The foregoing forum provisions may prevent or limit a stockholder's ability to file a lawsuit in a judicial forum that it prefers for disputes with us or our directors, officers, employees, stockholders or agents, which may discourage such lawsuits, make them more difficult or expensive to pursue, and result in outcomes that are less favorable to such stockholders than outcomes that may have been attainable in other jurisdictions.

In addition, notwithstanding the inclusion of the foregoing forum provisions in the charter, courts may find the foregoing forum provisions to be inapplicable or unenforceable in certain cases that the foregoing forum provisions purport to address, including claims brought under the Securities Act. If this were to occur in any particular lawsuit, we may incur additional costs associated with resolving such lawsuit in other jurisdictions or resolving lawsuits involving similar claims in multiple jurisdictions, all of which could harm our business, results of operations, and financial condition.

General Risk Factors

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

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

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

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

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

We may not be able to protect our brand from third party infringement or to increase our brand awareness.

Maintaining and strengthening our brands is important to maintaining and expanding our business, as well as to our ability to enter into new markets for our technologies, products and services. If we fail to promote and maintain these brands successfully, our ability to sustain and expand our business and enter into new markets may suffer. Much of the promotion of our brand depends, among other things, on hardware device manufacturing companies and service providers displaying our trademarks on their products. If these companies choose for any reason not to display our trademarks on their products, or if these companies use our trademarks incorrectly or in an unauthorized manner, the strength of our brand may be diluted or our ability to maintain or increase our brand awareness may be harmed. We generally rely on enforcing our trademark rights to prevent unauthorized use of our brand and technologies. Our ability to prevent unauthorized uses of our brand and technologies would be negatively impacted if our trademark registrations were overturned in the jurisdictions where we do business. We also have trademark applications pending in a number of jurisdictions that may not ultimately be granted, or if granted, may be challenged or invalidated, in which case we would be unable to prevent unauthorized use of our brand and logo in such jurisdictions. We have not filed trademark registrations in all jurisdictions where our brand and logo are used.

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

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

intellectual property on reasonable terms, or need to substitute similar technology from another source, our business, financial position, results of operations and cash flows could suffer.

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

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

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

Our business operations are subject to natural disasters and industry-wide failure and adverse events.

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

The provision of certain of our products and services depends on the continuing operation of communications and transmission systems and mechanisms, including satellite, cable, wire, internet and over-the-air. These communication and transmission systems and mechanisms are subject to significant risks and any damage to or failure of these systems and mechanisms could result in an interruption of the provision of our products and services.

Several of our major business operations are subject to interruption by earthquake, fire, power shortages, terrorist attacks and other hostile acts, and other events beyond our control. The majority of our research and development activities, our corporate headquarters, our principal information technology systems and other critical business operations are located near major seismic faults. Our operating results and financial condition could be materially harmed in the event of a major earthquake or other natural or man-made disaster that disrupts our business. The communications and transmission systems and mechanisms that we depend on are not fully redundant, and our disaster recovery planning cannot account for all eventualities.

Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

Our principal corporate headquarters with approximately 61,000 square feet, which house administrative, sales, marketing and research and development facilities, are located in San Jose, California, and are held under an operating lease. We also lease another office building with approximately 127,000 square feet in San Jose, California and own an office building with approximately 89,000 square feet in Calabasas, California to house additional administrative, sales, marketing, research and development personnel. We also lease facilities in other locations, including the United States, Republic of Ireland, Romania, Poland, the United Kingdom, China, India, Japan, South Korea, Taiwan, Singapore and Mexico. We believe that our existing space is adequate for our current operations. We believe that suitable replacement and additional space, to the extent needed, will be available in the future on commercially reasonable terms.

Item 3. Legal Proceedings

In the normal course of our business, we are involved in legal proceedings. In the past, we have litigated to enforce our respective patents and other intellectual property rights, to enforce the terms of license agreements, to protect trade secrets, to determine the validity and scope of the proprietary rights of others and to defend ourselves or our customers against claims of infringement or invalidity. We expect to continue to be involved in similar legal proceedings in the future, including proceedings regarding infringement of our patents, and proceedings to ensure proper and full payment of royalties by licensees under the terms of our license agreements.

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

Patent Infringement Litigation

From time-to-time in the ordinary course of our patent licensing business, we are required to engage in litigation to protect our intellectual property from infringement. While litigation is never our preference and we prefer to reach mutually agreeable commercial licensing arrangements with third parties, it is sometimes a necessary step to effectively protect our investment in patented technology. As a result of these lawsuits, defendants have often filed *Inter Partes* Review ("IPR") petitions with the U.S. Patent Office's Patent Trial and Appeal Board (and other similar post-grant proceedings outside of the U.S.) seeking to invalidate one or more of the patents-in-suit. We are currently engaged in multiple lawsuits with several third parties.

Comcast Patent Infringement Litigation

Since April 1, 2016, TiVo's subsidiary Rovi Corporation and various of its subsidiaries (collectively, "Rovi") have been involved in a series of lawsuits against Comcast Corporation ("Comcast") pending in the United States International Trade Commission (the "ITC") and United States District Courts. The lawsuits arose when Comcast's twelve-year patent license with Rovi (and its predecessors) expired on March 31, 2016. After being unable to agree on terms for a renewal before the license expired, Rovi initially filed multiple lawsuits against Comcast, and subsequently filed additional lawsuits against Comcast in various venues in the United States.

Rovi filed three ITC investigations (along with four companion district court cases asserting the same patents) and two standalone cases in various United States District Courts involving a total of 37 patents. Comcast filed IPRs against all of the patents involved in these actions.

In the first ITC investigation, the ITC issued (1) a limited exclusion order prohibiting the unlicensed entry of certain digital video receivers and hardware and software components thereof that infringed two particular Rovi patents and (2) a cease and desist order prohibiting Comcast from conducting in the United States several enumerated activities, including, among others, selling and leasing any infringing set-top boxes that it had already imported. In addition, the ITC found certain of Rovi's asserted patents either not infringed by Comcast or its set-top box suppliers, lacking a domestic industry or invalid. All appeals of the first ITC investigation have been exhausted and the ITC's decision is final.

In the second ITC investigation, the ITC issued (1) a limited exclusion order prohibiting the entry into the United States of infringing digital video receivers and related hardware and software components that infringed one of Rovi's asserted patents, and (2) a cease and desist order directed to Comcast. The ITC also found certain of Rovi's asserted patents either not infringed by Comcast, lacking a domestic industry or invalid. Both Rovi and Comcast have filed appeals of the ITC's final determination in the second ITC investigation.

In the third ITC investigation, the Administrative Law Judge issued her Final Initial Determination in which she found that Comcast's X1 platform infringes two Rovi patents and recommended the issuance of a limited exclusion order and cease and desist order. On October 13, 2020, the ITC issued its notice of its decision to review in part the Final Initial Determination and requesting written submissions on various issues. The ITC determined to review certain issues.

All of the pending district court cases that Rovi has filed against Comcast were stayed pending either (a) the final outcomes in their corresponding ITC cases, or (b) final rulings (including all available appeals) of pending IPRs, with one exception being that one case was proceeding with respect to a single patent.

On November 9, 2020, we announced that we entered into a license agreement with Comcast. In connection with the license agreement, the parties settled all outstanding litigation, pursuant to which all pending ITC investigations and district court cases between them have been terminated or dismissed. This matter is now concluded.

Videotron Patent Infringement Litigation

On June 23, 2017, Rovi Guides, Inc. and TiVo Solutions Inc. (together, "TiVo") filed a patent infringement complaint against Videotron Ltd. and Videotron G.P. (together, "Videotron") in Toronto, Canada, alleging infringement of six patents. Videotron was a prior licensee under the Rovi patent portfolio. The first week of trial on four patents was held the week of March 9, 2020. The Federal Court of Canada closed due to COVID-19 on March 16, 2020, and the trial was temporarily stayed. The trial resumed on May 25, 2020, conducted remotely by video, and concluded on June 17, 2020. The parties filed their written closing submissions on September 30, 2020. The closing oral arguments were held in January 2021. There is no set date for the court to issue its judgement.

Bell and Telus Patent Infringement Litigation

On January 19, 2018, TiVo filed a patent infringement complaint against Bell Canada (and four of its affiliates) in Toronto, Canada, alleging infringement of six patents. On February 2, 2018, TiVo filed a patent infringement complaint against Telus Corporation (and two of its affiliates) in Toronto, Canada, alleging infringement of the same six patents. Bell Canada and Telus Corporation were previously indirectly licensed to some of Rovi's patents through a prior agreement between Rovi and one of their suppliers. The Bell Canada and Telus Corporation cases are being heard together for purposes of pre-trial and trial proceedings. On August 27, 2019, the court issued an order bifurcating the liability phase from the damages phase of the case. There is no set trial date or procedural schedule for the damages phase of the cases. The liability and injunction trial on four patents was held from July 13 – August 6, 2020. The closing arguments were held in January 2021. There is no set date for the court to issue its judgement.

NVIDIA Patent Infringement Litigation

On May 8, 2019, Invensas Corporation and Tessera Advanced Technologies, Inc. filed a complaint against NVIDIA Corporation ("NVIDIA") in the United States District Court for the District of Delaware, alleging infringement of five patents, and requesting, among other things, that NVIDIA be ordered to pay compensatory damages in an amount no less than a reasonable royalty. NVIDIA answered the complaint on July 1, 2019 and subsequently moved to transfer the case to the United States District Court for the Northern District of California. The court denied NVIDIA's motion to transfer on September 17, 2019.

In September 2020, the Patent Trial and Appeal Board ("PTAB") instituted IPRs of several patents-in-suit. The parties stipulated to an order staying the litigation pending resolution of the IPR proceedings, and to dismissal of claims relating to the two patents. For the remaining IPRs, oral arguments are scheduled for June 2021, and final decisions are expected in September 2021.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

The common stock of Xperi Holding Corporation is listed on the Nasdaq Global Select Market under the symbol "XPER." Prior to June 1, 2020, (the "TiVo Merger Date"), the common stock of Xperi Corporation (the predecessor company) was listed on the Nasdaq Global Select Market under the symbol "XPER." Prior to February 23, 2017, our common stock had traded publicly on the Nasdaq Global Select Market under the symbol "TSRA".

As of February 8, 2021, there were 104,791,729 outstanding shares of common stock held by 390 stockholders of record. In addition, a substantially greater number of stockholders may be "street name" or beneficial holders, whose shares are held of record by banks, brokers and other financial institutions.

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

Recent Sales of Unregistered Securities

None.

Stock Repurchases

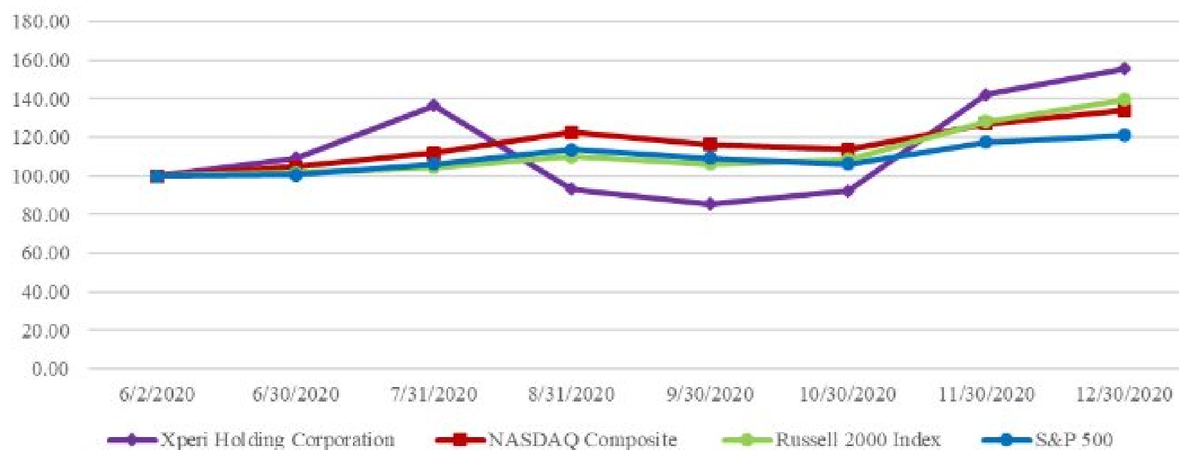
On June 12, 2020, our Board of Directors authorized a stock repurchase program providing for the repurchase of up to $150 million of the Company's common stock. The timing, price and volume of repurchases will be based on market conditions, relevant securities laws and other factors. The stock repurchases may be made from time to time, through solicited or unsolicited transactions in the open market, in privately negotiated transactions, or pursuant to a Rule 10b5-1 plan. The program may be discontinued or amended at any time and has no specified expiration date. All repurchases in the three months ended December 31, 2020 were made under this program as described below:

(Shares in thousands)	Total number of shares purchased	Average price paid per share	Total number of shares purchased as part of our share repurchase program	Approximate dollar value of shares that may yet be purchased under our share repurchase program (a)
2020				
October	—	$ —	—	
November	78	19.29	78	
December	931	19.87	931	
Total	1,009	$ 19.82	1,009	$79.9 million

(a) Calculated as of December 31, 2020.

Stock Performance Graph

The common stock of Xperi Holding Corporation commenced trading on June 2, 2020 following the completion of the Mergers. The following graph shows a comparison of total stockholder return for holders of our common stock, the Nasdaq Composite Index, the Russell 2000 Index and the S&P 500 from June 2, 2020 through December 31, 2020. The graph and table assume that $100 was invested on June 2, 2020 in each of our common stock, the Nasdaq Composite Index, the Russell 2000 Index and the S&P 500, and that all dividends were reinvested. This graphic comparison is presented pursuant to the rules of the SEC.



	6/2/2020	6/30/2020	7/31/2020	8/31/2020	9/30/2020	10/30/2020	11/30/2020	12/30/2020
Xperi Holding Corporation	$ 100.00	$ 109.25	$ 136.49	$ 93.11	$ 85.38	$ 92.14	$ 142.15	$ 155.64
Nasdaq Composite	$ 100.00	$ 104.69	$ 111.83	$ 122.55	$ 116.23	$ 113.56	$ 126.96	$ 133.95
Russell 2000 Index	$ 100.00	$ 101.63	$ 104.39	$ 110.13	$ 106.31	$ 108.48	$ 128.32	$ 139.61
S&P 500	$ 100.00	$ 100.63	$ 106.18	$ 113.62	$ 109.16	$ 106.14	$ 117.55	$ 121.14

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

Item 6. (Reserved)

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

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

This section of this Form 10-K generally discusses 2020 and 2019 items and year-to-year comparisons between 2020 and 2019. Discussions of 2018 items and year-to-year comparisons between 2019 and 2018 that are not included in this Form 10-K can be found in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of the Annual Report on Form 10-K for the year ended December 31, 2019, filed with the SEC by Xperi Corporation on February 18, 2020, which is available free of charge on the SEC's website at www.sec.gov and our Investor Relations website at investor.xperi.com.

Business Overview

On December 18, 2019, Xperi Corporation ("Xperi") entered into a definitive agreement with TiVo Corporation ("TiVo"), to combine in an all-stock merger of equals transaction (the "Mergers"). Following consummation of the Mergers on June 1, 2020, Xperi Holding Corporation became the parent company of both Xperi and TiVo. The common stock of both Xperi and TiVo were de-registered after completion of the Mergers. On June 2, 2020, Xperi Holding Corporation's common stock, par value $0.001 per share, commenced trading on the Nasdaq Global Select Market ("Nasdaq") under the ticker symbol "XPER." Xperi was determined to be the accounting acquirer in the Mergers. As a result, the historical financial statements of Xperi for periods prior to the Mergers are considered to be the historical financial statements of Xperi Holding Corporation. As used herein, the "Company," "we," "us" and "our" refer to Xperi when referring to periods prior to June 1, 2020 and Xperi Holding Corporation when referring to periods subsequent to June 1, 2020. Our results of operations include the operations of TiVo after June 1, 2020. For further discussion on the Mergers, refer to "Item 1A. Risk Factors," and "Note 9 – Business Combination" in the Notes to Consolidated Financial Statements.

We are a leading consumer and entertainment product/solutions licensing company and one of the industry's largest intellectual property (IP) licensing platforms, with a diverse portfolio of media and semiconductor intellectual property and more than 11,000 patents and patent applications worldwide. We invent, develop, and deliver technologies that enable extraordinary experiences. Xperi technologies, delivered via our brands (DTS, HD Radio, IMAX Enhanced, Invensas, TiVo), and by our subsidiary, Perceive Corporation ("Perceive"), make entertainment more entertaining, and smart devices smarter. Our technologies are integrated into billions of consumer devices, media platforms, and semiconductors worldwide, driving increased value for partners, customers and consumers. We shape how millions of consumers access and experience entertainment content, and our innovations are found in billions of devices and hundreds of millions of interfaces around the globe. Headquartered in Silicon Valley with operations around the world, we have approximately 1,850 employees and over 30 years of operating experience.

We are currently contemplating and may pursue, subject to any required regulatory approvals, a separation of our Product business and IP Licensing business through a tax-efficient transaction, resulting in two independent, publicly traded companies. We are evaluating the optimal timing of the contemplated business separation and currently anticipate that such separation will not be completed earlier than the first half of 2022.

COVID-19 Impact

Our business and results of operations have been adversely affected by the global COVID-19 pandemic and related events and we expect its impact to continue. Given the ongoing and dynamic nature of the circumstances, it is difficult to predict the full impact of the COVID-19 pandemic on our businesses, and there is no guarantee that we will be able to address its adverse impacts fully or effectively. The impact to date has included periods of significant volatility in various markets and industries. The volatility has had, and we anticipate it will continue to have, an adverse effect on our customers and on our business, financial condition and results of operations, and may result in an impairment of our long-lived assets, including goodwill, increased credit losses and impairments of investments in other companies. In particular, the automotive market, as well as the broad consumer electronics industries, have been and we anticipate will continue to be impacted by the pandemic and/or other events beyond our control, and further volatility could have an additional negative impact on these industries, customers, and our business. For example, we experienced an approximately 15% decline in our royalty revenue in 2020 from our products sold to the automotive market, such as HD Radio, as compared to the prior year, and currently expect automotive royalties will remain below previous levels for at least the near-term. In addition, the COVID-19 pandemic and to a lesser extent, U.S. restrictions on trade with certain Chinese customers have and may continue to impact the financial conditions of our customers, who may not be able to satisfy their obligations under our agreements timely or at all. For example, we recorded provisions for credit losses of approximately $2.0 million and $4.3 million in the first and fourth quarters of 2020, respectively, due to the

heightened risk of nonpayment on existing accounts receivable as a result of the impaired financial condition and liquidity positions of certain of our customers.
In addition, actions by United States federal, state and foreign governments to address the COVID-19 pandemic, including travel bans, stay-at-home orders and school, business and entertainment venue closures, also had a significant adverse effect on the markets in which we conduct our businesses. COVID-19 poses the risk that our workforce, suppliers, and other partners may be prevented from conducting normal business activities for an indefinite period of time, including due to shutdowns or stay-at-home orders that may be requested or mandated by governmental authorities. We also implemented policies to allow our employees to work remotely as a result of the pandemic as we reviewed processes related to workplace safety, including social distancing and sanitation practices recommended by the Centers for Disease Control and Prevention. The impacts of the COVID-19 pandemic could also cause delays in obtaining new customers and executing renewals and could also impact our business as consumer behavior changes in response to the slowed economic conditions. Furthermore, our ongoing integration efforts following the Mergers may be delayed or interrupted due to the operational challenges and various restrictions and limitations imposed on us as a result of the COVID-19 pandemic, which may adversely affect the success of the integration and anticipated benefits of the Mergers.
We have been closely monitoring the COVID-19 pandemic and its impact on our business, including legislation to mitigate the impact of COVID-19 such as the Coronavirus Aid, Relief, and Economic Security (CARES) Act which was enacted on March 27, 2020. Although a significant portion of our anticipated revenue for 2021 is derived from fixed-fee and minimum-guarantee arrangements, primarily from large, well-capitalized customers which we believe somewhat mitigates the risks to our business, our per-unit and variable fees based revenue will continue to be susceptible to the volatility and potential market downturns induced by the COVID-19 pandemic. Although we are unable to predict the full impact and duration of COVID-19 on our business, we are actively managing our financial expenditures in response to the current uncertainty. Further discussion of the potential impacts on our business from the COVID-19 pandemic is provided under Part I, *Item 1A – Risk Factors*.

Results of Operations

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

- On November 9, 2020, we entered into a patent license agreement (the “Agreement”) with Comcast Corporation (“Comcast”) and certain of its affiliates. In connection with the Agreement, we resolved all of the outstanding litigation with Comcast. The Agreement is effective as of the expiration of Comcast’s prior agreement in 2016 and its term continues into 2031. The Agreement had a significant positive impact on our financial results in 2020.
- On June 1, 2020, we completed the Mergers with TiVo, we incurred significant one-time expenses in 2020 such as transaction related costs (e.g. bankers fees, legal fees, consultant fees), lease impairment charges due to facilities consolidation, severance and retention costs (including stock-based compensation expense resulting from the contractually-required acceleration of equity instruments for departing executives). Additionally, our amortization expense increased significantly due to the valuation of TiVo’s intangible assets recorded as a result of the Mergers.
- On December 10, 2018, we entered into an agreement with Samsung Electronics, Co., Ltd. (“Samsung”) to settle and dismiss all pending litigation matters. In conjunction with the settlement, Samsung entered into a new patent license agreement with us. The settlement had a material impact on our financial results in 2018.

Revenue

We generate our revenue from the following principal activities.

License Agreements

We operate in two business segments. In our Product segment, we license our audio, digital radio, imaging, edge-based machine learning and multi-channel video user experience (“UX”) solutions. In our IP Licensing segment, we license (i) our media patent portfolios (“Media IP licensing”) to multichannel video programming distributors (MVPDs), OTT video service providers, consumer electronics manufacturers, social media, and other new media companies and (ii) our semiconductor technologies and associated patent portfolios (“Semiconductor IP licensing”) to memory, sensors, RF component, and foundry companies. We license our technologies and portfolios under three revenue models: (i) fixed-fee Media IP licensing, (ii) fixed-fee or minimum guarantee Semiconductor IP or Product licensing, and (iii) per-unit or per-subscriber royalty licenses.

Fixed-fee Media IP licensing

Our long-term fixed-fee Media IP licensing agreements provide our customers with the rights to future patented technologies over the term of the agreement that are highly interdependent or highly interrelated to the patented technologies provided at the inception of the agreement. We treat these rights as a single performance obligation with revenue recognized on a straight-line basis over the term of the fixed-fee license agreement.

At times, we enter into license agreements in which a licensee is released from past patent infringement claims and is granted a license to ship an unlimited number of units or for an unlimited number of subscribers over a future period for a fixed fee. In these arrangements, we allocate the transaction price between the release for past patent infringement claims and the future license. As the release from past patent infringement claims is generally satisfied at execution of the agreement, the transaction price allocated to the release from past patent infringement claims is generally recognized in the period the agreement is executed and the amount of transaction price allocated to the future license is recognized ratably over the future license term.

Fixed-fee or minimum guarantee Semiconductor IP or Product licensing

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

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

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

Per-unit or per-subscriber royalty licenses

We recognize revenue from per-unit or per-subscriber royalty licenses in the period in which the licensee's sales or production are estimated to have occurred, which results in an adjustment to revenue when actual sales or production are subsequently reported by the licensee, which is generally in the month or quarter following usage or shipment. We generally recognize revenue from royalty licenses on a per-subscriber per-month model for licenses with service providers and a per-unit shipped or manufactured model for licenses with CE manufacturers and memory, sensors, RF component, and foundry companies. Estimating licensees' quarterly royalties prior to receiving the royalty reports requires us to make significant assumptions and judgments related to forecasted trends and growth rates used to estimate quantities shipped by customers, which could have a material impact on the amount of revenue we report on a quarterly basis.

Arrangements with Multiple System Operators for the TiVo Service

Our arrangements with multiple system operators (MSOs) typically include software customization and set-up services, associated maintenance and support, limited training, post-contract support, TiVo-enabled DVRs, non-DVR STBs and the TiVo service.

We have two types of arrangements with MSOs that include technology deployment and engineering services. In instances where we host the TiVo service, non-refundable payments received for customization and set-up services are deferred and recognized as revenue ratably over the hosting term. The related cost of such services is capitalized to the extent it is deemed

recoverable and amortized to cost of revenue over the same period as the related TiVo service revenue is recognized. We estimate the stand-alone selling prices for training, DVRs, non-DVR STBs and maintenance and support based on the price charged in stand-alone sales of the promised good or service. The stand-alone selling price for the TiVo service is determined considering the size of the MSO and expected volume of deployment, market conditions, competitive landscape, internal costs and total gross margin objectives. For a term license to the TiVo service, we receive license fees for the hosted TiVo service on either a per-subscriber per-month basis or a fixed fee. We recognize revenue from per-subscriber per-month licenses during the month the TiVo service is provided to the customer and recognize revenue from fixed fee licenses ratably over the license period.

In arrangements where we do not host the TiVo service and that include engineering services that are essential to the functionality of the licensed technology or involve significant customization or modification of the software, we recognize revenue as progress toward completion is made using an input method based on the ratio of costs incurred to date to total estimated costs of the project. Estimating project costs requires forecasting costs, tracking progress toward completion and projecting the remaining effort to complete the project. These estimates are reassessed throughout the term of the arrangement, and revisions to estimates are recognized on a cumulative catch-up basis when the changed conditions become known. We generally recognize revenue from license fees for the TiVo service that the Company does not host on a per-subscriber per-month basis due to the recognition constraint on intellectual property usage-based royalties.

Subscription Services

Subscription services revenue primarily consists of fees to provide customers with access to one or more of our hosted products such as the iGuide IPG, advanced search and recommendations, metadata and analytics products, including routine customer support. We generally receive per-subscriber per-month fees for the iGuide IPG and search and recommendations service and revenue is recorded in the month the customer uses the service. We generally receive a monthly or quarterly fee from our metadata or analytics licenses for the right to use the metadata or access our analytics platform and to receive regular updates. Revenue from our metadata and analytics service is recognized ratably over the subscription period.

TiVo-enabled DVRs and non-DVRs and related TiVo Service

We sell TiVo-enabled DVRs and non-DVRs and the related service directly to customers through sales programs via the TiVo.com website and license the sale of TiVo-enabled DVRs and non-DVRs through a limited number of retailers. After the initial subscription period, all customers have various pricing options when they renew their subscription.

The transaction price allocated to the DVR is recognized as revenue upon shipment to the customer and the transaction price allocated to the TiVo service is recognized as revenue ratably over the service period. Subscription revenue from lifetime subscriptions is recognized ratably over the estimated useful life of the DVR associated with the subscription. The estimated useful life for a DVR depends on a number of assumptions, including, but not limited to, customer retention rates, the timing of new product introductions and historical experience. We periodically reassess the estimated useful life of a DVR. When the actual useful life of the DVR materially differs from our estimates, the estimated useful life of the DVR is adjusted, which could result in the recognition of revenue over a longer or shorter period of time.

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

	Years ended December 31,		
	2020	2019	2018
Revenue:			
Licensing, services and software	98%	100%	100%
Hardware	2	—	—
Total revenue	100	100	100
Operating expenses:			
Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets	6	3	3
Cost of hardware revenue, excluding depreciation and amortization of intangible assets	2	—	—
Research, development and other related costs	22	40	26
Selling, general and administrative	28	42	30
Depreciation expense	2	2	2
Amortization expense	18	36	27
Litigation expense	2	2	6
Total operating expenses	80	125	94
Operating income (loss)	20	(25)	6
Interest expense	(4)	(8)	(6)
Other income and expense, net	—	3	2
Loss on debt extinguishment	(1)	—	—
Income (loss) before taxes	15	(30)	2
Provision for (benefit from) income taxes	(1)	(7)	2
Net income (loss)	16%	(23)%	(0)%

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

	Years Ended December 31,			2020 vs. 2019	
	2020	2019	2018	Increase	% Change
Total revenue	$ 892,020	$ 280,067	$ 406,133	$ 611,953	219%

The $612.0 million or 219% increase in total revenue for the year ended December 31, 2020, compared to the prior year, was primarily due to the inclusion of revenue from TiVo operations following the Mergers, which included revenue from the patent license agreement with Comcast as discussed below, and Semiconductor IP agreements executed during the first two quarters of 2020. These increases in revenue were partially offset by a decrease in per-unit royalty revenue from existing licensing agreements.

On November 9, 2020, we entered into a patent license agreement (the "Agreement") with Comcast and we resolved all of the outstanding litigation with Comcast. The Agreement is effective as of the expiration of Comcast's prior agreement in 2016 and its term continues into 2031. The Agreement provided for an initial payment by Comcast upon execution and provides for ongoing payments through the remainder of the Agreement. In connection with the Agreement, we recorded revenue for past royalties in the fourth quarter of 2020 and expect to recognize revenue from the prospective license into 2031.

Cost of Licensing, Services and Software Revenue, Excluding Depreciation and Amortization of Intangible Assets

Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets, consists primarily of employee-related costs, royalties paid to third parties, maintenance costs and an allocation of facilities costs, as well as service center and other expenses related to providing the TiVo Service, non-recurring engineering ("NRE") services and our metadata offering.

Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets, for the year ended December 31, 2020 was $57.3 million, as compared to $8.1 million for the year ended December 31, 2019, an increase of $49.2 million. The increase was primarily due to the inclusion of $49.0 million of TiVo expenses since the Mergers.

We anticipate cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets, will continue to increase in 2021 when compared to 2020 due to including a full year of TiVo operations in our consolidated results.

Cost of Hardware Revenue, Excluding Depreciation and Amortization of Intangible Assets

Cost of hardware revenue, excluding depreciation and amortization of intangible assets, includes all product-related costs associated primarily with TiVo-enabled devices, including third-party manufacturing costs, employee-related costs, warranty costs, order fulfillment costs, certain licensing costs, and an allocation of facilities costs.

Cost of hardware revenue, excluding depreciation and amortization of intangible assets, for the year ended December 31, 2020 was $21.1 million, as compared to $0.3 million for the year ended December 31, 2019, an increase of $20.8 million. The increase was primarily due to the inclusion of $20.0 million of TiVo expenses since the Mergers.

We anticipate cost of hardware revenue, excluding depreciation and amortization of intangible assets, will continue to increase in 2021 when compared to 2020 primarily due to including a full year of TiVo operations in our consolidated results as well as expected growth in sales of hardware products.

Research, Development and Other Related Costs

Research, development and other related costs (“R&D expense”) are comprised primarily of employee-related costs, stock-based compensation expense, engineering consulting expenses associated with new product and technology development, product commercialization, quality assurance and testing costs, as well as costs related to patent applications and examinations, product "tear downs" and reverse engineering, materials, supplies, equipment depreciation and an allocation of facilities costs. All research, development and other related costs are expensed as incurred.

R&D expense for the year ended December 31, 2020 was $195.2 million as compared to $110.9 million for the year ended December 31, 2019, an increase of $84.3 million. The increase was due to the inclusion of $76.2 million of post-merger TiVo R&D expenses in 2020, increased headcount and personnel costs in Perceive, an internal startup that focuses on delivering edge-based inference solutions, and severance charges incurred in connection with consolidating and optimizing post-merger operations.

We believe that a significant level of R&D expense will be required for us to remain competitive in the future. We also anticipate that R&D expense will increase in 2021 when compared to 2020 due primarily to including a full year of TiVo operations in our consolidated results.

Selling, General and Administrative

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

Selling, general and administrative expenses for the year ended December 31, 2020 were $245.4 million, as compared to $117.7 million for the year ended December 31, 2019, an increase of $127.7 million. The increase was due principally to the inclusion of $92.8 million of TiVo expenses, an increase in merger related transaction costs of $24.8 million, post-merger severance and retention costs of $14.3 million, and $4.8 million in costs associated with the contemplated separation of our business, partially offset by a reduction in travel and entertainment expenses.

We anticipate selling, general and administrative expenses will increase in 2021 when compared to 2020 due to including a full year of TiVo operations in our consolidated results.

Depreciation Expense

Depreciation expense was $17.9 million for the year ended December 31, 2020, as compared to $6.7 million for the year ended December 31, 2019, an increase of $11.2 million. The increase was primarily attributable to depreciation expense on TiVo fixed assets added since the Mergers.

We anticipate depreciation expense will continue to increase in 2021 as compared to 2020 as a result of incurring the full year effect of TiVo's assets after the Mergers.

Amortization Expense

Amortization expense for the year ended December 31, 2020 was $156.8 million, as compared to $99.9 million for the year ended December 31, 2019, an increase of $56.9 million. The increase was primarily attributable to amortization of intangible assets recorded in connection with the Mergers in June 2020, partially offset by certain intangible assets becoming fully amortized over the past twelve months.

As a result of the Mergers, we anticipate that amortization expenses will continue to be a significant expense since we acquired approximately $878.0 million in intangible assets which will be amortized over the next several years. See "Note 10 - Goodwill and Identified Intangible Assets" in the Notes to Consolidated Financial Statements for additional information.

Litigation Expense

Litigation expense for the year ended December 31, 2020 was $20.8 million, as compared to $5.1 million for the year ended December 31, 2019, an increase of $15.7 million. The increase was primarily due to inclusion of post-merger TiVo litigation expenses and increased case activity in 2020.

In 2019 and 2020, prior to the Mergers, TiVo's litigation expense was significantly higher than Xperi's litigation expense in the same periods. We expect that litigation expense will continue to be a material portion of our operating expenses. Litigation expense may fluctuate between periods because of planned or ongoing litigation, as described in Part I, Item 3 – Legal Proceedings, and because of litigation planned for or initiated from time to time in the future in order to enforce and protect our intellectual property and contract rights.

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

Stock-based Compensation Expense

The following table sets forth our stock-based compensation expense for the years ended December 31, 2020, 2019 and 2018 (in thousands):

	Years Ended December 31,		
	2020	**2019**	**2018**
Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets	$ 781	$ —	$ —
Research, development and other related costs	13,592	14,643	13,168
Selling, general and administrative	24,762	16,911	17,843
Total stock-based compensation expense	$ 39,135	$ 31,554	$ 31,011

Stock-based compensation awards include restricted stock awards and units, employee stock plan purchases and employee stock options. The increase in stock-based compensation for the year ended December 31, 2020, compared to the prior year, was primarily a result of including incremental expense of $5.8 million from assumed TiVo stock awards and expenses from new, post-merger grants to legacy TiVo employees in 2020 as well as increases in restricted stock awards and units as a result of the Mergers.

Interest Expense

Interest expense for the year ended December 31, 2020 was $37.9 million, as compared to $23.4 million for the year ended December 31, 2019. The increase in interest expense was primarily a result of a higher average debt balance as compared to

2019 as we entered into a new term loan of $1,050 million on June 1, 2020 to refinance the indebtedness of the combined companies in connection with the Mergers.

We anticipate interest expense will increase in 2021 when compared to 2020 as a result of a full year of the higher debt balance and amortization of debt discount and issuance costs.

Other Income and Expense, Net

Other income and expense, net, for the year ended December 31, 2020 was $4.5 million, as compared to $9.0 million for the year ended December 31, 2019. Other income was lower in the current year principally due to a decrease in interest income from financing components from revenue contracts, and secondarily from a decline in interest income from our short-term investments.

Loss on Debt Extinguishment

In connection with the Mergers, we refinanced the indebtedness of the combined Company, and recognized a loss on early debt extinguishment of $8.3 million in 2020. We did not incur a loss on early debt extinguishment in 2019 or 2018.

Provision for (benefit from) Income Taxes

For the year ended December 31, 2020, we recorded an income tax benefit of $7.9 million on a pretax income of $135.9 million, which resulted in an effective tax rate of (5.8)%. The income tax benefit of $7.9 million was primarily related to a net decrease in valuation allowance as a result of the Mergers, eligible deductions from foreign-derived intangible income (“FDII”), releases of unrecognized tax benefits due to the lapse of applicable statutes of limitation, deductibility of certain transaction expenses, and unrealized foreign exchange gains from the prior period South Korea refund claim, partially offset by tax expense from operating income, withholding taxes, shortfalls from stock-based compensation, and certain non-deductible expenses.

For the year ended December 31, 2019, we recorded an income tax benefit of $19.0 million on a pretax loss of $83.1 million, which resulted in an effective tax rate of 22.9%. The income tax benefit for the year ended December 31, 2019 was primarily related to tax benefit from operating losses, tax credits, the release of valuation allowance on certain deferred tax assets related to tax credits, and eligible deductions from FDII, offset by an increase in valuation allowance against deferred tax assets primarily related to capitalized research expenses, foreign withholding taxes, non-deductible stock-based compensation and certain non-deductible expenses.

During the fourth quarter of 2019, we filed a refund claim for foreign taxes previously withheld from licensees in South Korea based on court rulings in South Korea and other business factors. These previously-withheld foreign taxes were claimed as a foreign tax credit in the U.S. As a result of the 2019 refund claim and a planned refund claim for 2020, we recorded $123.0 million and $65.2 million as a noncurrent income tax receivable at December 31, 2020 and 2019, respectively, $62.3 million and $48.2 million as a noncurrent income tax payable at December 31, 2020 and 2019, respectively, and $36.7 million and $17.0 million as a reduction in deferred tax assets at December 31, 2020 and 2019, respectively.

The need for a valuation allowance requires an assessment of both positive and negative evidence when determining whether it is more-likely-than-not that deferred tax assets are recoverable. Such assessment is required on a jurisdiction-by-jurisdiction basis. In making such assessment, significant weight is given to evidence that can be objectively verified. After considering both positive and negative evidence to assess the recoverability of our net deferred tax assets, we determined that it was not more-likely-than-not that we would realize our federal, certain state and certain foreign deferred tax assets given the substantial amount of tax attributes that will remain unutilized to offset reversing deferred tax liabilities as of December 31, 2020. We intend to continue maintaining a full valuation allowance on our federal deferred tax assets until there is sufficient evidence to support the reversal of all or some portion of these allowances. However, given our current earnings and anticipated future earnings, we believe that there is a reasonable possibility that within the next 12 months, sufficient positive evidence may become available to allow us to reach a conclusion that a significant portion of the federal valuation allowance will no longer be needed. Release of the valuation allowance would result in the recognition of certain federal deferred tax assets and a decrease to income tax expense for the period the release is recorded. However, the exact timing and amount of the valuation allowance release are subject to change based on the factors present when reevaluating both positive and negative evidence.

Segment Operating Results

In connection with the Mergers, we re-evaluated our reportable segments. We concluded that we have two reportable segments: (1) Product and (2) IP Licensing. There are certain corporate overhead costs that are not allocated to these reportable segments because these operating amounts are not considered in evaluating the operating performance of our business segments.

Our Chief Executive Officer has been determined to be the Chief Operating Decision Maker ("CODM") in accordance with the authoritative guidance on segment reporting.

The Product segment consists primarily of licensing our internally-developed audio, digital radio, imaging, edge-based machine learning and multi-channel video user experience ("UX") solutions. Audio, digital radio, imaging solutions and edge-based machine learning include the delivery of software and/or hardware-based solutions to our consumer electronics ("CE") customers, automotive manufacturers or their supply chain partners. UX products and services revenue is primarily derived from multi-channel video service providers and CE manufacturers, licensing the TiVo service and selling TiVo-enabled devices like the Stream 4K, Personalized Content Discovery, enriched Metadata, viewership data and advertising.

The IP Licensing segment consists primarily of licensing our innovations to leading companies in the media and semiconductor industries. Licensing arrangements include access to one or more of our foundational patent portfolios and may also include access to some of our industry-leading technologies and proven know-how. In media, our licensees include multichannel video programming distributors, OTT video service providers, consumer electronics manufacturers, social media and other new media companies. In semiconductor, our licensees include memory, sensors, RF component, and foundry companies.

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

The following table sets forth our segment revenue, operating expenses and operating income (loss) for the years ended December 31, 2020, 2019 and 2018 (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Revenue:			
Product segment	$ 376,101	$ 198,124	$ 218,349
IP Licensing segment	515,919	81,943	187,784
Total revenue	892,020	280,067	406,133
Operating expenses:			
Product segment	351,913	186,562	185,370
IP Licensing segment	113,363	44,542	74,002
Unallocated operating expenses (1)	249,117	117,671	122,781
Total operating expenses	714,393	348,775	382,153
Operating income (loss):			
Product segment	24,188	11,562	32,979
IP Licensing segment	402,556	37,401	113,782
Unallocated operating expenses (1)	(249,117)	(117,671)	(122,781)
Total operating income (loss)	$ 177,627	$ (68,708)	$ 23,980

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

For year ended December 31, 2020, the unallocated operating expenses were $249.1 million compared to $117.7 million for the year ended December 31, 2019. The increase of $131.4 million was due primarily to the inclusion of TiVo expenses, one-time merger related transaction costs, post-merger severance and retention costs, and costs associated with the contemplated separation of our business.

The revenue and operating income (loss) amounts in this section have been presented on a basis consistent with GAAP applied at the segment level. Of our $847.0 million in goodwill at December 31, 2020, approximately $523.8 million is allocated to our Product segment and approximately $323.2 million is allocated to our IP Licensing segment.

Product Segment

	Years Ended December 31,		
	2020	2019	2018
	(in thousands)		
Total revenue	$ 376,101	$ 198,124	$ 218,349
Operating expenses:			
Total cost of revenue	77,895	8,461	13,291
Research, development and other related costs	160,025	83,043	78,497
Litigation	2,864	1,656	—
Depreciation	12,896	5,328	5,038
Amortization	98,233	88,074	88,544
Total operating expenses (1)	351,913	186,562	185,370
Total operating income (loss)	$ 24,188	$ 11,562	$ 32,979

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

The increase in revenue in 2020, as compared to 2019, was primarily attributable to the inclusion of TiVo revenue since the Mergers and higher minimum guarantee (“MG”) revenue due to the timing and duration of MG contracts up for renewal and executed during 2020, partially offset by a decrease in per-unit royalty revenue from existing licensing arrangements driven primarily by the COVID-19 impact.

The increase in operating expenses in 2020, as compared to 2019, was primarily due to the inclusion of TiVo Product expenses, increased headcount and personnel costs in Perceive, partially offset by lower legacy Xperi amortization expense due to certain intangible assets becoming fully amortized over the past twelve months.

We expect R&D expense will continue to be significant in this segment as we develop new products and solutions, and as we include a full year of R&D expenses from TiVo operations in 2021.

Operating income for the years ended December 31, 2020 and 2019 was $24.2 million and $11.6 million, respectively, which represented an increase of $12.6 million, for the reasons stated above.

IP Licensing Segment

	Years Ended December 31,		
	2020	2019	2018
	(in thousands)		
Total revenue	$ 515,919	$ 81,943	$ 187,784
Operating expenses:			
Total cost of revenue	462	—	—
Research, development and other related costs	35,129	27,807	26,359
Litigation	17,891	3,471	26,099
Depreciation	1,288	1,393	1,638
Amortization	58,593	11,871	19,906
Total operating expenses (1)	113,363	44,542	74,002
Total operating income	$ 402,556	$ 37,401	$ 113,782

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

The increase in revenue in 2020, as compared to 2019, was primarily attributable to inclusion of post-merger TiVo IP Licensing revenue including past royalties revenue from Comcast as discussed in "Results of Operations," and secondarily Semiconductor IP agreements executed during 2020, partially offset by a decrease in revenue from other Semiconductor IP license agreements.

The increase in operating expenses in 2020, as compared to 2019, was primarily due to the inclusion of TiVo IP Licensing expenses, including significant amortization of intangible assets recorded as a result of the Mergers, partially offset by lower legacy Xperi amortization expense due to certain intangible assets becoming fully amortized over the past twelve months.

In 2019 and in 2020, prior to the Mergers, TiVo's litigation expenses were significantly higher than Xperi's litigation expenses in the same periods. We expect that litigation expense will continue to be a material portion of our operating expenses and may fluctuate between periods because of planned or ongoing litigation, as described in Part I, Item 3 – *Legal Proceedings*, and because of litigation planned for or initiated from time to time in the future in order to enforce and protect our intellectual property and contract rights.

Operating income for the years ended December 31, 2020 and 2019 was $402.6 million and $37.4 million, respectively, which represented an increase of $365.2 million, for the reasons stated above.

Liquidity and Capital Resources

	December 31,					
(in thousands, except for percentages)		**2020**		**2019**		**2018**
Cash and cash equivalents	$	170,188	$	74,551	$	113,625
Short-term investments		86,947		46,926		40,739
Total cash, cash equivalents and short-term investments	$	257,135	$	121,477	$	154,364
Percentage of total assets		10%		12%		12%

	Years Ended December 31,					
		2020		**2019**		**2018**
Net cash from operating activities	$	427,603	$	169,253	$	135,133
Net cash from investing activities	$	17,840	$	(19,143)	$	11,432
Net cash from financing activities	$	(351,136)	$	(189,184)	$	(171,200)

Our primary sources of liquidity and capital resources are our operating cash flows and our short-term investments. Cash, cash equivalents and short-term investments were $257.1 million at December 31, 2020, an increase of $135.6 million from $121.5 million at December 31, 2019. This increase resulted primarily from $427.6 million in cash generated from operations, $1,010.3 million in net long-term debt proceeds received and $117.4 million in cash acquired from TiVo as a result of the Mergers, which was partially offset by $1,254.9 million in repayment of combined legacy indebtedness and the 2020 Term B Loan Facility, $80.6 million in repurchases of common stock, $50.9 million in purchases of intangible assets and $30.8 million in dividends paid. Cash and cash equivalents totaled $170.2 million at December 31, 2020, an increase of $95.6 million from $74.6 million at December 31, 2019.

Cash flows provided by operations were $427.6 million for the year ended December 31, 2020, primarily due to our net income of $143.8 million, non-cash items of depreciation of $17.9 million, amortization of intangible assets of $156.8 million, stock-based compensation expense of $39.1 million and loss on debt extinguishment of $8.3 million, plus $76.8 million in changes in operating assets and liabilities. These increases were partially offset by a reduction of $34.7 million in deferred income taxes.

Cash flows provided by operations were $169.3 million for the year ended December 31, 2019, primarily due to our net loss of $64.0 million, non-cash items of depreciation of $6.7 million, amortization of intangible assets of $99.9 million and stock-based compensation expense of $31.6 million, plus $131.0 million in changes in operating assets and liabilities. These increases were partially offset by a reduction of $38.6 million in deferred income taxes.

Net cash provided by investing activities was $17.8 million for the year ended December 31, 2020, primarily related to net cash acquired in the Mergers of $117.4 million and maturities and sales of securities of $35.9 million, partially offset by purchases of short-term investments of $77.2 million, purchases of intangible assets of $50.9 million and capital expenditures of $7.4 million.

Net cash used in investing activities was $19.1 million for the year ended December 31, 2019, primarily related to the purchases of short-term available-for-sales securities of $40.0 million, $8.8 million in capital expenditures and patent acquisition of $4.5 million, partially offset by maturities and sales of securities of $34.1 million.

Net cash used in financing activities was $351.1 million for the year ended December 31, 2020 principally due to $1,254.9 million in repayment of indebtedness, $80.6 million in repurchases of common stock and $30.8 million in dividends paid, partially offset by $1,010.3 million in net long-term debt proceeds and $4.9 million in proceeds due to the issuance of common stock under our employee stock option programs and employee stock purchase plans.

Net cash used in financing activities was $189.2 million for the year ended December 31, 2019 principally due to $150.0 million in partial pay-down of debt principal, $39.5 million in dividends paid and $4.5 million in repurchases of common stock, partially offset by $6.0 million in proceeds due to the issuance of common stock under our employee stock option programs and employee stock purchase plans.

The primary objectives of our investment activities are to preserve principal and to maintain liquidity while at the same time capturing a market rate of return. To achieve these objectives, we maintain a diversified portfolio of securities including money market funds and debt securities including corporate bonds and notes, municipal bonds and notes, commercial paper, treasury and agency notes and bills and certificates of deposit. We invest excess cash predominantly in high-quality investment grade debt securities with less than three years to maturity. Our marketable debt securities are classified as available-for-sale (“AFS”) with credit losses recognized as a credit loss expense and non-credit related unrealized gains and losses, net of tax, recorded in accumulated other comprehensive income or loss. The fair values for our securities are determined based on quoted market prices as of the valuation date and observable prices for similar assets.

For AFS debt securities in an unrealized loss position, we first assess whether we intend to sell, or it is more-likely-than-not that we will be required to sell the security before recovery of its amortized cost basis. If either of the criteria regarding intent or requirement to sell is met, the security's amortized cost basis is written down to fair value through income. For AFS debt securities that do not meet the aforementioned criteria, we evaluate whether the decline in fair value has resulted from credit losses or other factors. In making this assessment, we consider the extent to which fair value is less than amortized cost, any changes to the rating of the security by a rating agency, and adverse conditions specifically related to the security, among other factors. If this assessment indicates that a credit loss exists, the present value of cash flows expected to be collected from the security are compared to the amortized cost basis of the security. If the present value of cash flows expected to be collected is less than the amortized cost basis, a credit loss exists and an allowance for credit losses is recorded for the credit loss, limited by the amount that the fair value is less than the amortized cost basis. Any impairment that has not been recorded through an allowance for credit losses is recognized in accumulated other comprehensive income or loss. We did not recognize a provision for credit loss expense related to our AFS debt securities in 2020. For 2019 and 2018, we did not record any impairment charges related to our AFS debt securities.

In the third quarter of 2018, we initiated an equity position in Onkyo Corporation (“Onkyo”), a publicly traded company listed on the JASDAQ market of the Tokyo Stock Exchange. Under Topic 321, we measure equity securities with readily determinable market value at fair value and recognize any changes in fair value in net income (loss). In July 2019, we sold approximately 2.8 million shares of Onkyo stock, for which a realized gain of $0.9 million was recognized for the year ended December 31, 2019. In June 2020, we sold the remaining 4.2 million shares of Onkyo stock, for which a realized loss of $0.7 million was recognized for the year ended December 31, 2020. There were no sales of the Onkyo investment in 2018, during which period an unrealized loss of $2.2 million was recognized.

On December 1, 2016, we entered into a Credit Agreement with Royal Bank of Canada (“RBC”) which provided for a $600.0 million seven-year term B loan facility. The Term B Loan Facility was scheduled to mature on November 30, 2023. During 2019 we made three voluntary principal payments totaling $150.0 million, and upon consummation of the Mergers on June 1, 2020, we repaid the full remaining balance of $344.0 million under the Credit Agreement. In addition, upon consummation of the Mergers on June 1, 2020, we repaid $734.6 million of assumed TiVo debt with the proceeds from a new borrowing of $1,050 million discussed below.

On June 1, 2020, in connection with the consummation of the Mergers, we entered into a Credit Agreement (the “2020 Credit Agreement”) by and among us, the lenders party thereto and Bank of America, N.A., as administrative agent and collateral agent. The 2020 Credit Agreement provides for a five-year senior secured term loan B facility in an aggregate principal amount of $1,050 million (the “2020 Term B Loan Facility”). The interest rate applicable to loans outstanding under the 2020 Term B Loan Facility is equal to, at our option, either (i) a base rate plus a margin of 3.00% per annum or (ii) LIBOR plus a margin of 4.00% per annum. Commencing on September 30, 2020, the 2020 Term B Loan Facility will amortize in quarterly installments equal to (i) with respect to repayments occurring on or prior to June 1, 2023, 1.25% of the original principal amount of the

2020 Term B Loan Facility and (ii) with respect to repayments occurring after June 1, 2023 and prior to June 1, 2025, 1.875% of the original principal amount of the 2020 Term B Loan Facility, with the balance payable on the maturity date of the 2020 Term B Loan Facility (in each case subject to adjustment for prepayments). The 2020 Term B Loan Facility will mature on June 1, 2025. Upon the closing of the 2020 Credit Agreement, we borrowed $1,050 million under the 2020 Term B Loan Facility. Net proceeds were used on June 1, 2020, together with cash and cash equivalents, to repay existing indebtedness of the combined Company, including the aforementioned Term B Loan Facility with RBC. We commenced repaying quarterly installments under the 2020 Term B Loan Facility in the third quarter of 2020. The agreement permits prepayment of principal without penalty and on December 31, 2020, we elected to make a voluntary principal payment of $150.0 million.

At December 31, 2020, $873.8 million was outstanding under the 2020 Term B Loan Facility with an interest rate, including amortization of debt discount and issuance costs, of 5.1%. Interest is payable monthly. Under the existing loan agreements, we have future minimum principal payments for our debt of $52.5 million annually through 2022, then $72.2 million and $78.8 million in 2023 and 2024, respectively, with the remaining principal balance due in 2025. We are obligated to pay a portion of excess cash flow on an annual basis beginning March 31, 2022 based on certain ratios and our excess cash flow generated for the immediately preceding fiscal year as well as for any litigation settlements subsequent to the Mergers. The voluntary principal payment described above may be offset against any obligated payments due as of March 31, 2022. The 2020 Term B Loan Facility contains customary covenants, and as of December 31, 2020 we were in full compliance with such covenants.

In August 2007, Xperi's Board of Directors authorized a plan to repurchase Xperi's outstanding shares of common stock dependent on market conditions, share price and other factors. This authorization was terminated upon closing of the Mergers. On June 12, 2020, our Board of Directors authorized a new stock repurchase program (the "new plan") providing for the repurchase of up to $150.0 million of our common stock dependent on market conditions, stock price and other factors. Since the inception of the new plan, and through December 31, 2020, we have repurchased approximately 4.9 million shares of common stock for a total cost of $70.1 million at an average price of $14.25 per share. During the three months ended December 31, 2020, our repurchases totaled $20.0 million. As of December 31, 2020, the total remaining amount available for repurchase was $79.9 million. We may continue to execute authorized repurchases from time to time under the new plan.

In 2020, we paid quarterly dividends of $0.20 per share in each of March and May and quarterly dividends of $0.05 per share in each of September and December. In 2019 and 2018, we paid quarterly dividends of $0.20 per share in each of March, June, September and December.

From 2018 through 2020, we generated approximately $732 million of cash flows from operating activities. While we expect to continue to generate cash flows from operating activities for 2021, the COVID-19 pandemic presents significant uncertainties to the level of such cash flows as compared to prior years. Additionally, integration of the two legacy businesses post-merger and transaction costs relating to the contemplated separation of the two businesses will impact operating cash flow for 2021. We have taken actions to manage cash flows by reducing discretionary spending and other variable costs, delaying employee hiring, and closely monitoring receivables and payables.

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

Contractual Obligations

Our contractual obligations as of December 31, 2020 were as follows (in thousands):

	Payments Due by Period				
	Total	**2021**	**2022-2023**	**2024-2025**	**Thereafter**
Long-term debt (1)	$ 873,798	$ 52,548	$ 124,688	$ 696,562	$ —
Interest on long-term debt (2)	137,669	35,405	64,077	38,187	—
Purchase obligations (3)	149,417	41,291	48,275	18,990	40,861
Operating lease obligations (4)	96,341	21,825	35,196	30,354	8,966
Total	$ 1,257,225	$ 151,069	$ 272,236	$ 784,093	$ 49,827

(1) Under the debt agreement, additional principal cash payments must be made on an annual basis beginning March 31, 2022 based on certain leverage ratios and excess cash flow generated for the immediately preceding fiscal year. See “Note 11 – Debt” for additional detail.
(2) Under the debt agreement, our debt bears a variable interest rate. Interest on the long-term debt is presented based on the interest rate in effect as of December 31, 2020. See “Note 11 – Debt” for additional detail.
(3) Amounts primarily represent future fixed and non-cancellable cash payments associated with purchase obligations to service providers, including the payments due within the next 12 months. Purchase orders for goods and services that are cancellable upon notice and without significant penalties are not included in the amounts above.
(4) Operating leases are presented on a gross basis. We have agreements to receive payments of approximately $32.1 million under subleases through 2026. Refer to “Note 8 – Leases” for additional detail.

Additionally, under certain contractual agreements, we may be obligated to make certain contingent or variable payments over an estimated period of approximately four years if certain conditions are met or milestones are achieved. See “Note 16 – Commitments and Contingencies” of the Notes to Consolidated Financial Statements for additional detail.

As of December 31, 2020, we had accrued $94.4 million of unrecognized tax benefits in long-term income taxes payable related to uncertain tax positions, which includes $2.5 million of accrued interest and penalties. At this time, we are unable to reasonably estimate the timing of the long-term payments or the amount by which the liability will increase or decrease over time. If we are successful in receiving our South Korean withholding tax refund of $123.0 million, net of interest income and foreign exchange loss, then $62.3 million of unrecognized tax benefit would be payable to the U.S. tax authorities. These amounts, which are included in our financial statements, have not been included in the table above.

Off-Balance Sheet Arrangements

As of December 31, 2020, we did not have any off-balance sheet arrangements as defined in item 303(a)(4)(ii) of Regulation S-K.

Critical Accounting Policies and Estimates

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

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

Revenue recognition

General

Revenue is recognized when control of the promised goods or services is transferred to a customer in an amount that reflects the consideration we expect to receive in exchange for those goods or services, which may include various combinations of goods and services which are generally capable of being distinct and accounted for as separate performance obligations. Revenue is recognized net of sales taxes collected from customers which are subsequently remitted to governmental authorities. In situations where foreign withholding taxes are withheld by our licensee, revenue is recognized gross of withholding taxes that are remitted directly by the licensee to a local tax authority.

Arrangements with Multiple Performance Obligations

Some of our contracts with customers contain multiple performance obligations. For these contracts, the individual performance obligations are separately accounted for if they are distinct. In an arrangement with multiple performance

obligations, the transaction price is allocated among the separate performance obligations on a relative stand-alone selling price basis. The determination of stand-alone selling price considers market conditions, the size and scope of the contract, customer and geographic information, and other factors. When observable prices are not available, stand-alone selling price for separate performance obligations is based on the cost-plus-margin approach, considering overall pricing objectives. The allocation of transaction price among performance obligations in a contract may impact the amount and timing of revenue recognized in the Consolidated Statements of Operations during a given period.

Variable Consideration

When a contract with a customer includes a variable transaction price, an estimate of the consideration which we expect to be entitled to for transferring the promised goods or services is made at contract inception. Depending on the terms of the contract, variable consideration is estimated using either the expected value approach or the most likely value approach. Under either approach to estimating variable consideration, the estimate considers all information (historical, current and forecast) that is reasonably available at contract inception. The amount of variable consideration is estimated at contract inception and updated as additional information becomes available. The estimate of variable consideration is included in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Subsequent changes in the transaction price resulting from changes in the estimate of variable consideration are allocated to the performance obligations in the contract on the same basis as at contract inception. Certain payments to licensees, retailers and distributors, such as market development funds and revenue shares, are treated as a reduction of the transaction price, and therefore a reduction to revenue, unless the payment is in exchange for a distinct good or service that the licensee, retailer or distributor transfers to us.

When variable consideration is in the form of a sales-based or usage-based royalty in exchange for a license of IP, or when a license of IP is the predominant item to which the variable consideration relates, revenue is recognized at the later of when the subsequent sale or usage occurs or the performance obligation to which some or all of the sales-based or usage-based royalty has been allocated has been satisfied or partially satisfied.

Nature of Goods and Services

We generate our revenue from the following principal activities.

License Agreements

We operate in two business segments. In our Product segment, we license our audio, imaging, edge-based machine learning and multi-channel video user experience (“UX”) solutions. In our IP Licensing segment, we license (i) our media patent portfolios (“Media IP licensing”) to multichannel video programming distributors, OTT video service providers, social media, consumer electronics manufacturers, and other providers of video experiences across various platforms, and (ii) our semiconductor technologies and associated patent portfolios (“Semiconductor IP licensing”) to memory, sensors, RF component, and foundry companies. We license our technologies and portfolios under three revenue models: (i) fixed-fee Media IP licensing, (ii) fixed-fee or minimum guarantee Semiconductor IP or Product licensing, and (iii) per-unit or per-subscriber royalty licenses.

Fixed-fee Media IP licensing

Our long-term fixed-fee Media IP licensing agreements provide our customers with the rights to future patented technologies over the term of the agreement that are highly interdependent or highly interrelated to the patented technologies provided at the inception of the agreement. We treat these rights as a single performance obligation with revenue recognized on a straight-line basis over the term of the fixed-fee license agreement.

At times, we enter into license agreements in which a licensee is released from past patent infringement claims and is granted a license to ship an unlimited number of units or for an unlimited number of subscribers over a future period for a fixed fee. In these arrangements, we allocate the transaction price between the release for past patent infringement claims and the future license. As the release from past patent infringement claims is generally satisfied at execution of the agreement, the transaction price allocated to the release from past patent infringement claims is generally recognized in the period the agreement is executed and the amount of transaction price allocated to the future license is recognized ratably over the future license term.

Fixed-fee or minimum guarantee Semiconductor IP or Product licensing

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

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

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

Per-unit or per-subscriber royalty licenses

We recognize revenue from per-unit or per-subscriber royalty licenses in the period in which the licensee's sales or production are estimated to have occurred, which results in an adjustment to revenue when actual sales or production are subsequently reported by the licensee, which is generally in the month or quarter following usage or shipment. We generally recognize revenue from royalty licenses on a per-subscriber per-month model for licenses with service providers and a per-unit shipped or manufactured model for licenses with CE manufacturers and memory, sensors, RF component, and foundry companies. Estimating licensees' quarterly royalties prior to receiving the royalty reports requires us to make significant assumptions and judgments related to forecasted trends and growth rates used to estimate customer sales or production, which could have a material impact on the amount of revenue we report on a quarterly basis.

Arrangements with Multiple System Operators for the TiVo Service

Our arrangements with multiple system operators ("MSOs") typically include software customization and set-up services, associated maintenance and support, limited training, post-contract support, TiVo-enabled DVRs, non-DVR STBs and the TiVo service.

We have two types of arrangements with MSOs that include technology deployment and engineering services. In instances where we host the TiVo service, non-refundable payments received for customization and set-up services are deferred and recognized as revenue ratably over the hosting term. The related cost of such services is capitalized to the extent it is deemed recoverable and amortized to cost of revenue over the same period as the related TiVo service revenue is recognized. We estimate the stand-alone selling prices for training, DVRs, non-DVR STBs and maintenance and support based on the price charged in stand-alone sales of the promised good or service. The stand-alone selling price for the TiVo service is determined considering the size of the MSO and expected volume of deployment, market conditions, competitive landscape, internal costs and total gross margin objectives. For a term license to the TiVo service, we receive license fees for the hosted TiVo service on either a per-subscriber per-month basis or a fixed fee. We recognize revenue from per-subscriber per-month licenses during the month the TiVo service is provided to the customer and recognize revenue from fixed fee licenses ratably over the license period.

In arrangements where we do not host the TiVo service and that include engineering services that are essential to the functionality of the licensed technology or involve significant customization or modification of the software, we recognize revenue as progress toward completion is made using an input method based on the ratio of costs incurred to date to total estimated costs of the project. Estimating project costs requires forecasting costs, tracking progress toward completion and projecting the remaining effort to complete the project. These estimates are reassessed throughout the term of the arrangement, and revisions to estimates are recognized on a cumulative catch-up basis when the changed conditions become known. We

generally recognize revenue from license fees for the TiVo service that the Company does not host on a per-subscriber per-month basis due to the recognition constraint on intellectual property usage-based royalties.

Subscription Services

Subscription services revenue primarily consists of fees to provide customers with access to one or more of our hosted products such as the iGuide IPG, advanced search and recommendations, metadata and analytics products, including routine customer support. We generally receive per-subscriber per-month fees for the iGuide IPG and search and recommendations service and revenue is recorded in the month the customer uses the service. We generally receive a monthly or quarterly fee from our metadata or analytics licenses for the right to use the metadata or access our analytics platform and to receive regular updates. Revenue from our metadata and analytics service is recognized ratably over the subscription period.

TiVo-enabled DVRs and non-DVRs, including TiVo Stream 4K, and related TiVo Service

We sell TiVo-enabled DVRs and non-DVRs and the related service directly to customers through sales programs via the TiVo.com website and license the sale of TiVo-enabled DVRs and non-DVRs through a limited number of retailers. After the initial subscription period for a DVR, all customers have various pricing options when they renew their subscription.

The transaction price allocated to the DVR and non-DVR is recognized as revenue upon shipment to the customer and the transaction price allocated to the TiVo service is recognized as revenue ratably over the service period. Subscription revenue from lifetime subscriptions is recognized ratably over the estimated useful life of the DVR or non-DVR associated with the subscription. The estimated useful life for a DVR and non-DVR depends on a number of assumptions, including, but not limited to, customer retention rates, the timing of new product introductions and historical experience. We periodically reassess the estimated useful life of DVRs and non-DVRs. When the actual useful life of a DVR or a non-DVR materially differs from our estimates, the estimated useful life of the DVR or non-DVR is adjusted, which could result in the recognition of revenue over a longer or shorter period of time.

Significant Judgments

Determining whether promises to transfer multiple goods and services in contracts with customers are considered distinct performance obligations that should be accounted for separately requires significant judgment, including related to the level of integration and interdependency between the performance obligations. In addition, judgment is necessary to allocate the transaction price to the distinct performance obligations, including whether there is a discount or significant financing component to be allocated based on the relative stand-alone selling price of the various performance obligations.

Significant judgment is required to determine the stand-alone selling price for each distinct performance obligation when an observable price is not available. In instances where stand-alone selling price is not directly observable, such as when we do not sell the good or service separately, the stand-alone selling price is determined using a range of inputs that includes market conditions and other observable inputs. More than one stand-alone selling price may exist for individual goods and services due to the stratification of those goods and services, considering attributes such as the size of the customer and geographic region.

Due to the nature of the work required to be performed on some performance obligations, significant judgment may be required to determine the transaction price. It is common for our license agreements to contain provisions that can either increase or decrease the transaction price. These variable amounts are generally estimated based on usage. In addition to estimating variable consideration, significant judgment is necessary to identify forms of variable consideration, determine whether the variable consideration relates to a sales-based or usage-based royalty of intellectual property and determine whether, and when to include estimates of variable consideration in the transaction price.

For certain licensees, royalty revenue is generated based on a licensee’s production or shipment of licensed products incorporating our intellectual property, technologies or software. Licensees with a per-unit or per-subscriber arrangement pay a per-unit royalty for each product manufactured or sold, or for each subscriber, as set forth in its license agreement. Licensees generally report manufacturing, sales or subscriber information in the month or quarter subsequent to when the production, shipment or subscription activity takes place. We estimate the royalties earned each quarter based on our forecast of manufacturing and sales activity by our licensees in that quarter. Any differences between actual royalties owed by a licensee and our estimates are recognized when the licensee’s royalty report is received. Estimating licensees’ quarterly royalties prior to receiving the royalty reports requires us to make significant assumptions and judgments related to forecasted trends and growth rates used to estimate quantities manufactured, shipped or subscribed by licensees, which could have a material impact on the amount of revenue recognized.

Some hardware products are sold with a right of return and, in certain circumstances, credits or incentives may be provided to customers or resellers at the time of sale. Such credits and incentives are accounted for as variable consideration and recognized as a reduction to revenue. Estimates of returns, credits and incentives are made at contract inception and updated each reporting period.

In contracts where we do not host the TiVo service and that include engineering services that are essential to the functionality of the licensed technology or involve significant customization or modification of software, or where we provide non-recurring engineering ("NRE") services, we recognize revenue as progress toward completion occurs using an input method based on the ratio of costs incurred to date to total estimated costs of the project. Significant judgment is required to estimate the remaining effort to complete the project. These estimates are reassessed throughout the term of the arrangement.

We evaluate our estimates, inputs and assumptions related to revenue recognition on an ongoing basis. The use of different estimates, inputs or assumptions may materially affect the reported amounts of assets and liabilities as of the date of the financial statements and the results of operations for the reporting period.

Business combinations

The fair value valuation of assets acquired and liabilities assumed in a Business combination under ASC 805 requires management to make significant estimates and assumptions. Critical estimates in determining the fair value of certain intangible assets include, but are not limited to: future expected cash flows from customer contracts, customer lists, and acquired developed technologies and patents; competitive trends and market comparables; brand awareness and market position, as well as assumptions about the period of time the brand will continue to be used in our product portfolio; and discount rates. For additional information, refer to "Note 9 – *Business Combination*" of the Notes to Consolidated Financial Statements.

Valuation of goodwill and intangible assets

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

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

Stock-based compensation expense

Stock-based compensation is measured at the grant date based on the estimated fair value of the award and is recognized as expense on a straight-line basis, net of estimated forfeitures, over the requisite service or performance period. We use the closing trading price of our common stock on the date of grant as the fair value of awards of restricted stock units ("RSUs"), and performance stock units ("PSUs") that are based on company-designated performance targets. A Monte Carlo simulation is used to estimate the fair value of restricted stock units subject to market conditions with expected volatility estimated using the historical volatility of our common stock.

We use the Black-Scholes-Merton option-pricing formula to estimate the fair value of stock options and employee stock purchase plan ("ESPP") shares. The Black-Scholes-Merton option-pricing formula uses complex and subjective inputs, including the expected life of the options, stock price volatility, dividends and the pre-vesting option forfeiture rate. We estimate the expected life of options granted based on historical exercise patterns, which we believe are representative of future behavior. We estimate the volatility of our common stock on the date of grant based on our stock's market-based historical

volatility. The assumptions used in calculating the fair value of stock-based awards represent our best estimates, but these estimates involve inherent uncertainties and the application of management judgment. As a result, if factors change and we use different assumptions, our stock-based compensation expense could be materially different in the future. In addition, we are required to estimate the expected forfeiture rate and only recognize expense for those shares expected to vest. We estimate the forfeiture rate based on historical experience of our stock-based awards that are granted, exercised and canceled. If our actual forfeiture rate is materially different from our estimate, stock-based compensation expense could be significantly different from what we have recorded in the current period. See "Note 14 - *Stock-Based Compensation Expense*" of the Notes to Consolidated Financial Statements for additional detail.

Accounting for income taxes

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

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

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

Our policy is to classify accrued interest and penalties related to the accrued liability for unrecognized tax benefits in the provision for income taxes. For the years ended December 31, 2020, 2019 and 2018, we did not recognize any significant penalties or interest related to unrecognized tax benefits. See "Note 15 - *Income Taxes*" of the Notes to Consolidated Financial Statements for additional detail.

Recent Accounting Pronouncements

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

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

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

Interest Rate Risk

As of December 31, 2020, we had $873.8 million of outstanding indebtedness that was subject to floating interest rates. Changes in economic conditions outside of our control could result in higher interest rates, thereby increasing our interest expense and reducing the funds available for capital investment, operations or other purposes. At December 31, 2020, a 1% increase in the effective interest rate on our outstanding debt throughout a one-year period would result in an annual increase in our interest expense of approximately $8.7 million. Any significant increase in our interest expense could negatively impact our results of operations and cash flows and also our ability to pay dividends in the future. If the U.S. Federal Reserve raises its benchmark interest rate, any increases would likely impact the borrowing rate on our outstanding indebtedness, and increase our interest expense, comparably.

Investment Risk

We are exposed to market risk as it relates to changes in the market value of our investments in addition to the liquidity and credit worthiness of the underlying issuers of our investments. Our investments are subject to fluctuations in fair value due to the volatility of the credit markets and prevailing interest rates for such securities. Our marketable debt securities, consisting primarily of municipal bonds and notes, corporate bonds and notes, commercial paper, treasury and agency notes and bills and certificates of deposit, are classified as available-for-sale securities with fair values of $86.9 million and $45.8 million as of December 31, 2020 and 2019, respectively. Unrealized losses, net of tax, on these investments were approximately $0.1 million and $0.1 million as of December 31, 2020 and 2019, respectively. We did not hold any derivatives, derivative commodity instruments or other similar financial instruments in our portfolio as of December 31, 2020.

Bank Liquidity Risk

As of December 31, 2020, we have approximately $135.0 million of cash in operating accounts that are held with both domestic and international financial institutions, the majority held with domestic financial institutions. These cash balances could be lost or become inaccessible if the underlying financial institutions fail or if they are unable to meet the liquidity requirements of their depositors and they are not supported by the government of the jurisdiction where such cash is held. We have not incurred any losses and have had full access to our operating accounts to date. We believe any failures of domestic and international financial institutions could impact our ability to fund our operations in the short term.

Exchange Rate Risk

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

Due to our operations outside the U.S., we are subject to the risks of fluctuations in foreign currency exchange rates, particularly related to the Euro, Indian rupee and British pound. As a substantial majority of our non-U.S. revenue and expense transactions are denominated in U.S. dollars, fluctuations in foreign currency exchange rates could cause our products and services to become relatively more expensive to customers in a particular country, leading to a reduction in sales or profitability in that country. Some of our subsidiaries operate in their local currency, which mitigates a portion of the exposure related to fluctuations in foreign currency exchange rates.

We are also affected by exchange rate fluctuations as the financial statements of our foreign subsidiaries are translated into U.S. dollars in consolidation. As exchange rates vary, these results, when translated, may vary from expectations and could adversely or positively impact overall profitability. During 2020, the impact of foreign exchange rate fluctuations related to translation of our foreign subsidiaries' financial statements was immaterial to our consolidated financial statements.

Item 8. Financial Statements and Supplementary Data

Our consolidated balance sheets as of December 31, 2020 and 2019, and the related consolidated statements of operations, equity, comprehensive income (loss) and cash flows for each of the years in the three-year period ended December 31, 2020 are set forth in this Annual Report at Item 15(a)(1).

SELECTED QUARTERLY FINANCIAL INFORMATION (UNAUDITED)

The following table presents our unaudited quarterly results of operations for the eight quarters in the periods ended December 31, 2020 and 2019.

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

	Three Months Ended (1)							
	Mar 31, 2019	Jun 30, 2019	Sep 30, 2019	Dec 31, 2019	Mar 31, 2020	Jun 30, 2020 (2)	Sep 30, 2020	Dec 31, 2020
	(in thousands, except per share amounts)							
Revenue:								
Licensing, services and software	$ 56,312	$ 75,031	$ 57,750	$ 90,420	$ 117,487	$ 135,996	$ 195,319	$ 427,801
Hardware	255	84	117	98	178	1,635	7,478	6,126
Total Revenue	56,567	75,115	57,867	90,518	117,665	137,631	202,797	433,927
Operating expenses:								
Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets	2,049	2,460	1,462	2,158	1,540	8,252	21,854	25,634
Cost of hardware revenue, excluding depreciation and amortization of intangible assets	158	69	44	61	44	1,428	12,216	7,389
Research, development and other related costs	26,659	25,346	25,998	32,846	28,607	38,227	57,731	70,589
Selling, general and administrative	29,281	27,252	27,588	33,550	36,606	68,195	63,785	76,770
Depreciation expense	1,668	1,759	1,629	1,665	1,729	3,333	6,753	6,103
Amortization expense	25,459	25,314	25,146	24,027	22,509	32,044	50,894	51,379
Litigation expense	1,290	1,231	1,527	1,079	2,103	3,871	8,527	6,281
Total operating expenses	86,564	83,431	83,394	95,386	93,138	155,350	221,760	244,145
Operating income (loss)	(29,997)	(8,316)	(25,527)	(4,868)	24,527	(17,719)	(18,963)	189,782
Interest expense	(6,685)	(6,199)	(5,506)	(4,987)	(4,251)	(6,958)	(13,393)	(13,271)
Other income, net	2,302	4,806	429	1,491	565	578	2,305	1,007
Loss on debt extinguishment	—	—	—	—	—	(8,300)	—	—
Income (loss) before taxes	(34,380)	(9,709)	(30,604)	(8,364)	20,841	(32,399)	(30,051)	177,518
Provision for (benefit from) income taxes	(8,950)	(3,547)	(14,583)	8,056	2,056	(9,299)	482	(1,126)
Net income (loss)	(25,430)	(6,162)	(16,021)	(16,420)	18,785	(23,100)	(30,533)	178,644
Less: Net loss attributable to noncontrolling interest	(347)	(341)	(407)	(408)	(551)	(487)	(781)	(1,147)
Net income (loss) attributable to the Company	$ (25,083)	$ (5,821)	$ (15,614)	$ (16,012)	$ 19,336	$ (22,613)	$ (29,752)	$ 179,791
Income (loss) per share attributable to the Company:								
Basic	$ (0.51)	$ (0.12)	$ (0.32)	$ (0.32)	$ 0.39	$ (0.33)	$ (0.28)	$ 1.70
Diluted	$ (0.51)	$ (0.12)	$ (0.32)	$ (0.32)	$ 0.39	$ (0.33)	$ (0.28)	$ 1.68
Weighted average number of shares used in per share calculations-basic	48,721	49,259	49,459	49,566	49,945	69,160	107,499	105,498
Weighted average number of shares used in per share calculations-diluted	48,721	49,259	49,459	49,566	50,199	69,160	107,499	106,907

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

(2) Three months ended June 30, 2020 include one month of financial results of TiVo following the Mergers as well as related one-time merger related transaction costs. All periods subsequent to June 2020 include financial results from TiVo post-merger.

Other Supplementary Data

The following tables present our quarterly unaudited non-GAAP financial measures for the eight quarters in the periods ended December 31, 2020 and 2019. The non-GAAP financial measures adjust for either one-time or ongoing non-cash acquired intangibles amortization charges; costs related to actual or planned business combinations including transaction fees, integration costs, severance, facility closures, and retention bonuses; separation costs; and all forms of stock-based compensation. We believe that the non-GAAP measures used in this report provide investors with important perspectives into our ongoing business performance. Our management uses these non-GAAP financial measures when evaluating our operating performance. The non-GAAP financial measures disclosed by us should not be considered a substitute for, or superior to, financial measures calculated in accordance with GAAP, and the financial results calculated in accordance with GAAP and reconciliations to those financial statements should be carefully evaluated. Our use of non-GAAP financial measures has certain limitations in that such non-GAAP financial measures may not be directly comparable to those reported by other companies. Other companies may use the same or similarly named measures, but exclude different items, which may not provide readers with a comparable view of our performance in relation to other companies.

	Three Months Ended							
	Mar 31, 2019	Jun 30, 2019	Sep 30, 2019	Dec 31, 2019	Mar 31, 2020	Jun 30, 2020	Sep 30, 2020	Dec 31, 2020
	(in thousands)							
GAAP operating income (loss)	$ (29,997)	$ (8,316)	$ (25,527)	$ (4,868)	$ 24,527	$ (17,719)	$ (18,963)	$ 189,782
Adjustments to GAAP operating income (loss):								
Stock-based compensation expense:								
Cost of revenue	—	—	—	—	—	73	258	450
Research, development and other	3,603	3,146	3,544	4,350	3,036	2,838	3,580	4,138
Selling, general and administrative	4,020	4,075	4,444	4,372	4,951	5,558	6,319	7,934
Amortization expense	25,459	25,314	25,146	24,027	22,509	32,044	50,894	51,379
Merger and integration-related costs:								
Transaction and other related costs recorded in selling, general and administrative	—	—	—	4,636	3,089	24,844	1,187	319
Separation costs recorded in selling, general and administrative	—	—	—	—	—	390	2,147	2,260
Severance and retention recorded to research, development and other	—	—	—	—	—	1,256	1,117	988
Severance and retention recorded to selling, general and administrative	—	—	—	—	—	5,645	2,474	1,292
Lease impairment recorded in selling, general and administrative	—	—	—	—	—	—	656	1,757
Non-GAAP operating income	$ 3,085	$ 24,219	$ 7,607	$ 32,517	$ 58,112	$ 54,929	$ 49,669	$ 260,299

	Three Months Ended							
	Mar 31, 2019	Jun 30, 2019	Sep 30, 2019	Dec 31, 2019	Mar 31, 2020	Jun 30, 2020	Sep 30, 2020	Dec 31, 2020
	(in thousands)							
Cash flow from operations	$ 13,821	$ 55,072	$ 35,321	$ 65,039	$ 32,644	$ 34,598	$ 62,191	$ 298,170
Adjustments to cash flow from operations:								
Purchases of property & equipment	(858)	(5,685)	(1,413)	(857)	(688)	(1,204)	(1,083)	(4,404)
Merger and integration costs	—	—	—	4,636	3,089	24,844	1,187	319
Separation-related costs	—	—	—	—	—	390	2,147	2,260
Severance	—	—	—	—	—	6,901	1,917	468
Adjusted free cash flow*	$ 12,963	$ 49,387	$ 33,908	$ 68,818	$ 35,045	$ 65,529	$ 66,359	$ 296,813

*Adjusted free cash flow is defined as operating cash flow, less purchases of property and equipment, plus merger and integration, separation, and severance costs.

Additional Financial Data

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

	Three Months Ended							
	Mar 31, 2019	Jun 30, 2019	Sep 30, 2019	Dec 31, 2019	Mar 31, 2020	Jun 30, 2020	Sep 30, 2020	Dec 31, 2020
Cash Tax Payments*	$ 5,599	$ 858	$ 5,917	$ 2,627	$ 5,637	$ 8,086	$ 16,924	$ 12,419

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

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

Not applicable.

Item 9A. Controls and Procedures

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

Evaluation of Disclosure Controls and Procedures

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

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act as of the end of the period covered by this report (the evaluation date). Based on this evaluation, because of the material weaknesses in internal control over financial reporting described below, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were not effective at the reasonable assurance level as of December 31, 2020.

Management's Report on Internal Control over Financial Reporting

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

Xperi Holding Corporation's management assessed the effectiveness of our internal control over financial reporting as of December 31, 2020, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on the assessment by Xperi Holding Corporation's management, we determined that the Company's internal control over financial reporting as of December 31, 2020 was not effective due to the material weaknesses described below.

The Company did not design and maintain effective controls related to the review of cash flow forecasts used in the valuation of intangible assets acquired in a business combination and the goodwill impairment analyses. Specifically, the control activities related to the review of the inputs and assumptions used in the development of the cash flow forecast used in the valuation of intangible assets acquired in a business combination and goodwill impairment analyses were not designed at an appropriate level of precision to prevent or detect a material misstatement. These control deficiencies did not result in a misstatement to our consolidated financial statements for the year ended December 31, 2020. However, these control deficiencies, if not remediated, could result in a misstatement to the annual or interim consolidated financial statements which would result in a material misstatement of the annual or interim consolidated financial statements that would not be prevented or detected. Accordingly, our management has determined that these control deficiencies constitute material weaknesses.

We have excluded the business associated with the acquisition of TiVo Corporation ("TiVo") from our assessment of internal control over financial reporting as of December 31, 2020 because the entity was acquired by the Company in a merger accounted for as a business combination during 2020. The total assets and total revenue of TiVo represent 14% and 67%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2020.

The effectiveness of Xperi Holding Corporation's internal control over financial reporting as of December 31, 2020 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears on page F-1 of this Annual Report on Form 10-K.

Remediation Plans

Our management, with oversight from our Audit Committee, is in the process of developing and implementing remediation plans in response to the identified material weaknesses described above. Specifically, we are designing and implementing additional control activities over the review of the inputs and assumptions in our cash flow forecasts. These controls are expected to require additional documentation and the development of procedures related to the valuation of intangible assets acquired in a business combination and goodwill impairment calculations.

These material weaknesses will not be considered remediated until the applicable remedial controls operate for a sufficient period of time and management has concluded, through testing, that these controls are operating effectively.

We believe the measures described above will remediate the control deficiencies we have identified and strengthen our internal control over financial reporting. We are committed to continuing to improve our internal control processes and will continue to review, optimize and enhance our financial reporting controls and procedures.

The process of designing and implementing an effective financial reporting system is a continuous effort that requires us to anticipate and react to changes in our business and the economic and regulatory environments and to expend significant resources to maintain a financial reporting system that is adequate to satisfy our reporting obligations. As we continue to evaluate and take actions to improve our internal control over financial reporting, we may determine to take additional actions to address control deficiencies or determine to modify certain of the remediation measures described above.

Changes in Internal Control over Financial Reporting

As required by Rule 13a-15(d) under the Exchange Act, the Company's management, including its Chief Executive Officer and Chief Financial Officer, has evaluated the Company's internal control over financial reporting to determine whether any changes occurred during the fourth fiscal quarter covered by this annual report that have materially affected or are reasonably likely to materially affect, our internal control over financial reporting. Based on that evaluation, there has been no such change during the fourth fiscal quarter of 2020.

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item 10 is hereby incorporated by reference from the information under the captions “Executive Officers,” “Election of Directors” and “Delinquent Section 16(a) Reports” that will be contained in the Proxy Statement for our 2021 Annual Meeting of Stockholders (the “Proxy Statement”).

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

Item 11. Executive Compensation

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

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

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

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

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

Item 14. Principal Accountant Fees and Services

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

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Documents filed as part of this report:

	Page Number
(1) ***Financial Statements***	
Report of Independent Registered Public Accounting Firm	F-1
Consolidated Statements of Operations	F-5
Consolidated Statements of Comprehensive Income (loss)	F-6
Consolidated Balance Sheets	F-7
Consolidated Statements of Cash Flows	F-8
Consolidated Statements of Equity	F-9
Notes to Consolidated Financial Statements	F-10
(2) ***Financial Statement Schedule***	
Valuation and Qualifying Accounts	
(3) ***Exhibits***	

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

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Xperi Holding Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Xperi Holding Corporation and its subsidiaries (the "Company") as of December 31, 2020 and 2019, and the related consolidated statements of operations, of comprehensive income (loss), of equity and of cash flows for each of the three years in the period ended December 31, 2020, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2020 appearing under Item 15 (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2020, 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, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company did not maintain, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO because material weaknesses in internal control over financial reporting existed as of that date related to the Company not designing and maintaining effective controls related to the review of cash flow forecasts used in the valuation of intangible assets acquired in a business combination and goodwill impairment analyses.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis. The material weaknesses referred to above are described in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. We considered these material weaknesses in determining the nature, timing, and extent of audit tests applied in our audit of the 2020 consolidated financial statements, and our opinion regarding the effectiveness of the Company's internal control over financial reporting does not affect our opinion on those consolidated financial statements.

Changes in Accounting Principles

As discussed in Note 3 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019 and the manner in which it accounts for revenue in 2018.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in management's report referred to above. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the

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

As described in Management's Report on Internal Control over Financial Reporting, management has excluded the business associated with the acquisition of TiVo Corporation (the "TiVo business") from its assessment of internal control over financial reporting as of December 31, 2020 because TiVo was acquired by the Company in a merger accounted for as a business combination during 2020. We have also excluded the TiVo business from our audit of internal control over financial reporting. The TiVo business has total assets and total revenues excluded from management's assessment and our audit of internal control over financial reporting representing approximately 14% and 67%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2020.

Definition and Limitations of Internal Control over Financial Reporting

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

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

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Revenue recognition – Allocation of Transaction Price in Fixed-Fee Media IP Licensing Arrangements

As described in Note 4 to the consolidated financial statements, at times, the Company enters into long-term fixed- fee media IP license agreements in which a licensee is released from past patent infringement claims or is granted a license to ship an unlimited number of units or for an unlimited number of subscribers over a future period for a fixed fee. In these arrangements, management allocates the transaction price between the release for past patent infringement claims and the future license. Revenue from the initial contract recognition of fixed-fee media IP licensing arrangements, which are related to the TiVo businesses, which were acquired in a merger during 2020, is a component of the total IP segment revenue of $515.9 million for the year ended December 31, 2020. In determining the stand-alone selling price of the release for past patent infringement claims and the future license, management considers such factors as the number of units shipped in the past or the number of past subscribers and the relevant geographies of the shipped units or subscribers, the future number of subscribers or units, as well as the licensing rate the Company generally receives for per subscriber or units shipped in the same geographies.

The principal considerations for our determination that performing procedures relating to revenue recognition – allocation of transaction price in fixed-fee media IP licensing arrangements is a critical audit matter are the significant judgment by management in (i) estimating the standalone selling price for certain performance obligations and (ii) allocating the transaction price on a relative standalone selling price basis to those individual performance obligations; this in turn led to significant auditor judgment, subjectivity and effort in performing procedures to evaluate management's estimates of standalone selling price and the allocation of transaction price to the individual performance obligations.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included the following for a sample of contracts, (i) reading executed contracts to understand the terms and conditions and performance obligations, (ii) evaluating management's identification of the individual performance obligations, (iii) testing management's determination of the transaction price and the allocation of the transaction price to the individual performance obligations based on relative standalone selling price, and (iv) evaluating and testing the reasonableness of the factors used in management's estimation of standalone selling price. Testing the estimation of standalone selling price involved testing the completeness and accuracy of the data utilized by management.

TiVo Merger – Valuation of Acquired Intangible Assets

As described in Notes 1, 2 and 9 to the consolidated financial statements, on December 18, 2019, Xperi Corporation ("Xperi") entered into an Agreement and Plan of Merger and Reorganization with TiVo Corporation ("TiVo") to combine in an all-stock merger of equals transaction (the "Mergers"). The merger consideration was calculated to be $828.3 million. The Company measured the identifiable assets acquired and liabilities assumed at fair value, which resulted in the recognition of $878.0 million of intangible assets. Identifiable intangible assets primarily consist of patents, developed technology, customer relationships, trademarks and tradenames, and content database. In determining the fair value, the Company utilized various forms of the income, cost and market approaches depending on the asset. The estimation of fair value required significant judgment related to cash flow forecasts, discount rates reflecting the risk inherent in each cash flow stream, competitive trends, market comparables and other factors. Inputs were generally determined using historical data supplemented by current and anticipated market conditions, and growth rates. Customer contracts and relationships relating to the IP business segment were valued using a "with and without" method. Significant assumptions used in this discounted cash flow analysis are the revenue growth rate, cost of sales, and discount rate. Patents, and other customer contracts and relationships relating to the Product business segment, were valued using an excess earnings method. Significant assumptions used in the discounted cash flow analysis for (i) other customer contracts and relationships were the revenue growth rate, EBITDA margins, and discount rate and (ii) patents were the revenue growth rate, EBITDA margins, and discount rate. Trademarks and tradenames, developed technology, and content database intangible assets were valued using a relief-from-royalty method. The significant assumptions used in the discounted cash flow analysis for (i) trademarks and tradenames were royalty rates, revenue growth rates, and discount rate and (ii) developed technology and content database were the royalty rates.

The principal considerations for our determination that performing procedures relating to the TiVo merger – valuation of acquired intangible assets is a critical audit matter are the significant judgment by management when determining the fair value estimates of the intangible assets acquired; this in turn led to significant auditor judgment, subjectivity, and effort in performing procedures relating to the fair value measurement of the intangible assets acquired and in evaluating management's significant assumptions related to, (i) revenue growth rate, cost of sales, and discount rate for the customer contracts and relationships related to the IP business segment; (ii) revenue growth rate, EBITDA margins, and discount rate for other customer contracts and relationships related to the Product business segment; (iii) revenue growth rate, EBITDA margins, and discount rate for the patents, (iv) royalty rates, revenue growth rates, and discount rate for the trademarks and tradenames, and (v) royalty rates for the developed technology and content database intangible assets. Also, the audit effort involved the use of professionals with specialized skill and knowledge. As described in the "Opinions on the Financial Statements and Internal Control over Financial Reporting" section, a material weakness was identified related to this matter specific to the precision of the design of controls relating to the review of the inputs and assumptions used in the development of the cash flow forecasts used in the valuation of intangible assets.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of certain controls relating to the valuation of the acquired intangible assets, including controls over (i) management's review of the valuation methods and completeness of intangible assets acquired and (ii) review of significant assumptions related to the royalty rates and discount rates. These procedures also included, among others, reading the purchase agreement and testing management's process in determining the fair value of the intangible assets acquired. Testing management's process included (i) evaluating the appropriateness of the valuation methods, (ii) testing the completeness and accuracy of data used by management, and (iii) evaluating the reasonableness of significant assumptions used by management related to the revenue growth rates, cost of sales, EBITDA margins, royalty rates, and discount rates. Evaluating the reasonableness of management's significant assumptions related to revenue growth rates, EBITDA margins, and cost of sales involved considering (i) past performance of the acquired business, (ii) the consistency with external market and industry data, and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the methods used to value the acquired intangible assets, and the royalty rate and discount rate assumptions.

Goodwill Impairment Assessments - Product Reporting Unit

As described in Notes 2 and 10 to the consolidated financial statements, the Company's consolidated goodwill balance was $847.0 million as of December 31, 2020, and the goodwill associated with the Product reporting unit was $523.8 million. Goodwill is evaluated for potential impairment annually and whenever events or changes in circumstances indicate the carrying amount of goodwill may not be recoverable. As of March 31, 2020, the Company proceeded with a quantitative interim goodwill impairment test and as a result, the Company concluded that the fair value of the reporting unit exceeded the carrying amount and no goodwill impairment charges were recognized. As of September 30, 2020, the Company proceeded with a quantitative annual goodwill impairment test and as a result, the Company concluded that the fair value of the reporting unit exceeded the carrying amount and no goodwill impairment charges were recognized. The Company first determines the fair value of a reporting unit using weighted results derived from an income approach and market approaches. The fair value using an income approach is estimated through the discounted cash flow method based on assumptions about future conditions such as revenue growth rates, operating expenses, EBITDA, discount rates, and other assumptions. Market approaches used by management include the market comparable method, which estimates the fair value based on revenue multiples from comparable companies in similar lines of business, and the market transaction method, which estimates the fair value by utilizing comparable transactions and transaction multiples.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessments of the Product reporting unit is a critical audit matter are the significant judgment by management when determining the fair value of the reporting unit, which in turn led to significant auditor judgment, subjectivity and effort in performing procedures and evaluating management's significant assumptions related to the revenue growth rates, operating expenses, EBITDA, and discount rate. In addition, the audit effort involved the use of professionals with specialized skill and knowledge. As described in the "Opinions on the Financial Statements and Internal Control over Financial Reporting" section, a material weakness was identified related to this matter specific to the precision of the design of controls relating to the review of the inputs and assumptions used in the development of the cash flow forecasts used to estimate the fair value of the reporting unit in performing the goodwill impairment analysis.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of certain controls relating to management's goodwill impairment assessments of the Product reporting unit, including controls over (i) management's review of the comparison of fair value and carrying value of the reporting unit, (ii) review of the valuation approach utilized and (iii) review of the discount rate assumption. These procedures also included, among others, (i) testing management's process for determining the fair value of the Product reporting unit, (ii) evaluating the appropriateness of the valuation approach, (iii) testing the completeness and accuracy of underlying data used in the estimate, and (iv) evaluating the significant assumptions related to the revenue growth rates, operating expenses, EBITDA, and discount rate. Evaluating management's significant assumptions related to the revenue growth rates, operating expenses, and EBITDA involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting unit, (ii) the consistency with external market and industry data, and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the valuation approach used in estimating the fair value of the reporting unit, and the discount rate assumption.

/s/ PricewaterhouseCoopers LLP
San Jose, California
February 26, 2021

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

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

	Years Ended December 31,		
	2020	2019	2018
Revenue:			
Licensing, services and software	$ 876,603	$ 279,513	$ 404,940
Hardware	15,417	554	1,193
Total revenue	892,020	280,067	406,133
Operating expenses:			
Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets	57,280	8,129	12,713
Cost of hardware revenue, excluding depreciation and amortization of intangible assets	21,077	331	578
Research, development and other related costs	195,154	110,850	104,856
Selling, general and administrative	245,356	117,671	122,781
Depreciation expense	17,918	6,721	6,676
Amortization expense	156,826	99,946	108,450
Litigation expense	20,782	5,127	26,099
Total operating expenses	714,393	348,775	382,153
Operating income (loss)	177,627	(68,708)	23,980
Interest expense	(37,873)	(23,377)	(25,665)
Other income and expense, net	4,455	9,028	8,595
Loss on debt extinguishment	(8,300)	—	—
Income (loss) before taxes	135,909	(83,057)	6,910
Provision for (benefit from) income taxes	(7,887)	(19,024)	8,673
Net income (loss)	143,796	(64,033)	(1,763)
Less: Net loss attributable to noncontrolling interest	(2,966)	(1,503)	(1,474)
Net income (loss) attributable to the Company	$ 146,762	$ (62,530)	$ (289)
Income (loss) per share attributable to the Company:			
Basic	$ 1.77	$ (1.27)	$ (0.01)
Diluted	$ 1.75	$ (1.27)	$ (0.01)
Weighted average number of shares used in per share calculations-basic	82,840	49,120	48,823
Weighted average number of shares used in per share calculations-diluted	83,856	49,120	48,823

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

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

	Years Ended December 31,		
	2020	**2019**	**2018**
Net income (loss)	$ 143,796	$ (64,033)	$ (1,763)
Other comprehensive income (loss), net of tax:			
Change in foreign currency translation adjustment	1,345	—	—
Net unrealized gains (losses) on available-for-sale debt securities	(28)	275	(25)
Other comprehensive income (loss), net of tax	1,317	275	(25)
Comprehensive income (loss)	145,113	(63,758)	(1,788)
Less: Comprehensive loss attributable to noncontrolling interest	(2,966)	(1,503)	(1,474)
Comprehensive income (loss) attributable to the Company	$ 148,079	$ (62,255)	$ (314)

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

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

	December 31,	
	2020	2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 170,188	$ 74,551
Available-for-sale debt securities, at fair value (amortized cost and allowance for credit losses of $86,963 and $0, respectively, at December 31, 2020)	86,947	45,802
Equity securities	—	1,124
Accounts receivable, net of allowance for credit losses of $7,336 and $566, respectively	115,975	24,177
Unbilled contracts receivable	132,431	121,826
Other current assets	40,763	13,735
Total current assets	546,304	281,215
Long-term unbilled contracts receivable	6,761	26,672
Property and equipment, net	63,207	32,877
Operating lease right-of-use assets	80,226	17,786
Intangible assets, net	1,004,379	232,275
Goodwill	847,029	385,784
Other long-term assets	153,270	71,336
Total assets	$ 2,701,176	$ 1,047,945
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	$ 13,045	$ 4,650
Accrued legal fees	5,783	1,316
Accrued liabilities	129,035	41,433
Current portion of long-term debt	43,689	—
Deferred revenue	33,119	720
Total current liabilities	224,671	48,119
Deferred revenue, less current portion	39,775	—
Long-term deferred tax liabilities	24,754	29,735
Long-term debt, net	795,661	334,679
Noncurrent operating lease liabilities	66,243	13,414
Other long-term liabilities	98,953	76,898
Total liabilities	1,250,057	502,845
Commitments and contingencies (Note 16)		
Company stockholders' equity:		
Preferred stock: $0.001 par value; authorized (2020: 15,000 shares; 2019: 10,000 shares) and no shares issued and outstanding	—	—
Common stock: $0.001 par value; (2020: authorized 350,000 shares, issued 110,182 shares, outstanding 104,775 shares; 2019: authorized 150,000 shares, issued 63,622 shares, outstanding 49,620 shares)	110	64
Additional paid-in capital	1,268,471	768,284
Treasury stock at cost (2020: 5,407 shares; 2019: 14,002 shares)	(77,218)	(368,701)
Accumulated other comprehensive income (loss)	1,264	(53)
Retained earnings	264,250	148,317
Total Company stockholders' equity	1,456,877	547,911
Noncontrolling interest	(5,758)	(2,811)
Total equity	1,451,119	545,100
Total liabilities and equity	$ 2,701,176	$ 1,047,945

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

XPERI HOLDING CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years Ended December 31,		
	2020	2019	2018
Cash flows from operating activities:			
Net income (loss)	$ 143,796	$ (64,033)	$ (1,763)
Adjustments to reconcile net income (loss) to net cash from operating activities:			
Depreciation of property and equipment	17,918	6,721	6,676
Amortization of intangible assets	156,826	99,946	108,450
Stock-based compensation expense	39,135	31,554	31,011
Deferred income tax	(34,670)	(38,611)	(15,578)
Loss on debt extinguishment	8,300	—	—
Other	19,500	2,654	5,322
Changes in operating assets and liabilities, net of business acquisitions:			
Accounts receivable	7,091	6,191	(14,381)
Unbilled contracts receivable, net	76,262	130,359	25,503
Other assets	(41,948)	3,675	(950)
Accounts payable	(4,863)	1,886	(1,469)
Accrued and other liabilities	21,692	(8,679)	(8,915)
Deferred revenue	18,564	(2,410)	1,227
Net cash from operating activities	427,603	169,253	135,133
Cash flows from investing activities:			
Purchases of property and equipment	(7,379)	(8,813)	(3,338)
Proceeds from sale of property and equipment	—	55	—
Net cash received (paid) for mergers and acquisitions	117,424	—	(500)
Purchases of short-term investments	(77,178)	(40,008)	(20,095)
Proceeds from sales of short-term investments	11,225	6,833	8,540
Proceeds from maturities of short-term investments	24,683	27,290	30,925
Purchases of intangible assets	(50,935)	(4,500)	(4,100)
Net cash from investing activities	17,840	(19,143)	11,432
Cash flows from financing activities:			
Repayment of debt	(520,250)	(150,000)	(100,000)
Repayment of assumed debt from merger transaction	(734,609)	—	—
Proceeds from debt, net	1,010,286	—	—
Contingent consideration payments after acquisition	—	(1,200)	(419)
Dividend paid	(30,829)	(39,502)	(39,187)
Proceeds from exercise of stock options	91	695	8,008
Proceeds from employee stock purchase program	4,764	5,329	5,196
Repurchases of common stock	(80,589)	(4,506)	(44,798)
Net cash from financing activities	(351,136)	(189,184)	(171,200)
Effect of exchange rate changes on cash and cash equivalents	1,330	—	—
Net increase (decrease) in cash and cash equivalents	95,637	(39,074)	(24,635)
Cash and cash equivalents at beginning of period	74,551	113,625	138,260
Cash and cash equivalents at end of period	$ 170,188	$ 74,551	$ 113,625
Supplemental disclosure of cash flow information:			
Interest paid	$ 31,240	$ 20,891	$ 23,134
Income taxes paid, net of refunds	$ 43,066	$ 15,001	$ 23,679
Stock issued in merger transaction	$ 828,334	$ —	$ —

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

XPERI HOLDING CORPORATION
CONSOLIDATED STATEMENTS OF EQUITY
(in thousands)

	Total Company Stockholders' Equity								
	Common Stock		Additional Paid-In Capital	Treasury Stock		Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Noncontrolling Interest	Total Equity
	Shares	Amount		Shares	Amount				
Balance at December 31, 2017	49,103	$ 60	$ 686,660	11,505	$ (319,397)	$ (303)	$ 68,556	$ —	$ 435,576
Cumulative-effect adjustment from adoption of ASU 2014-09	—	—	—	—	—	—	224,128	—	224,128
Issuance of subsidiary shares to noncontrolling interest	—	—	(179)	—	—	—	—	179	—
Net loss	—	—	—	—	—	—	(289)	(1,474)	(1,763)
Other comprehensive loss, net of tax	—	—	—	—	—	(25)	—	—	(25)
Cash dividends paid on common stock ($0.80 per share)	—	—	—	—	—	—	(39,187)	—	(39,187)
Issuance of common stock in connection with exercise of stock options	427	1	8,007	—	—	—	—	—	8,008
Issuance of common stock in connection with employee stock purchase plan	306	—	5,196	—	—	—	—	—	5,196
Issuance of restricted stock, net of shares canceled	871	1	—	—	—	—	—	—	1
Repurchases of common stock, shares exchanged	(162)	—	—	162	(3,429)	—	—	—	(3,429)
Repurchases of common stock	(2,137)	—	—	2,137	(41,369)	—	—	—	(41,369)
Stock-based compensation expense	—	—	31,011	—	—	—	—	—	31,011
Balance at December 31, 2018	48,408	$ 62	$ 730,695	13,804	$ (364,195)	$ (328)	$ 253,208	$ (1,295)	$ 618,147
Issuance of subsidiary shares to noncontrolling interest	—	—	13	—	—	—	—	(13)	—
Net loss	—	—	—	—	—	—	(62,530)	(1,503)	(64,033)
Other comprehensive income, net of tax	—	—	—	—	—	275	—	—	275
Other	—	—	—	—	—	—	(2,859)	—	(2,859)
Cash dividends paid on common stock ($0.80 per share)	—	—	—	—	—	—	(39,502)	—	(39,502)
Issuance of common stock in connection with exercise of stock options	42	—	694	—	—	—	—	—	694
Issuance of common stock in connection with employee stock purchase plan	386	1	5,328	—	—	—	—	—	5,329
Issuance of restricted stock, net of shares canceled	982	1	—	—	—	—	—	—	1
Repurchases of common stock, shares exchanged	(198)	—	—	198	(4,506)	—	—	—	(4,506)
Stock-based compensation expense	—	—	31,554	—	—	—	—	—	31,554
Balance at December 31, 2019	49,620	$ 64	$ 768,284	14,002	$ (368,701)	$ (53)	$ 148,317	$ (2,811)	$ 545,100
Issuance of subsidiary shares to noncontrolling interest	—	—	(19)	—	—	—	—	19	—
Net income (loss)	—	—	—	—	—	—	146,762	(2,966)	143,796
Other comprehensive income, net of tax	—	—	—	—	—	1,317	—	—	1,317
Cash dividends paid on common stock ($0.50 per share)	—	—	—	—	—	—	(30,829)	—	(30,829)
Issuance of common stock in connection with exercise of stock options	7	—	89	—	—	—	—	—	89
Issuance of common stock in connection with employee stock purchase plan	355	—	4,764	—	—	—	—	—	4,764
Issuance of restricted stock, net of shares canceled	2,083	2	—	—	—	—	—	—	2
Repurchases of common stock, shares exchanged	(671)	—	—	671	(10,508)	—	—	—	(10,508)
Repurchases of common stock	(4,919)	—	—	4,919	(70,081)	—	—	—	(70,081)
Common stock issued in merger transaction	58,300	58	828,276	—	—	—	—	—	828,334
Retirement of treasury stock	—	(14)	(372,058)	(14,185)	372,072	—	—	—	—
Stock-based compensation expense	—	—	39,135	—	—	—	—	—	39,135
Balance at December 31, 2020	104,775	$ 110	$ 1,268,471	5,407	$ (77,218)	$ 1,264	$ 264,250	$ (5,758)	$ 1,451,119

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

NOTE 1 – THE COMPANY AND BASIS OF PRESENTATION

On December 18, 2019, Xperi Corporation ("Xperi") entered into an Agreement and Plan of Merger and Reorganization with TiVo Corporation ("TiVo") to combine in an all-stock merger of equals transaction (the "Mergers"). Immediately following the consummation of the Mergers on June 1, 2020, (the "Merger Date"), Xperi Holding Corporation (the "Company"), a Delaware corporation founded in December 2019 under the name "XRAY-TWOLF HoldCo Corporation," became the parent company of both Xperi and TiVo. The common stock of Xperi and TiVo were de-registered after completion of the Mergers. On June 2, 2020, Xperi Holding Corporation's common stock, par value $0.001 per share, commenced trading on the Nasdaq Global Select Market ("Nasdaq") under the ticker symbol "XPER." See "Note 9 – Business Combination" for a more detailed description of the Mergers.

Xperi was determined to be the accounting acquirer in the Mergers. As a result, the historical financial statements of Xperi for periods prior to the Mergers are considered to be the historical financial statements of Xperi Holding Corporation. As used herein, the "Company" refers to Xperi when referring to periods prior to June 1, 2020 and to Xperi Holding Corporation when referring to periods subsequent to June 1, 2020. The Company's results of operations include the operations of TiVo after June 1, 2020, and TiVo's assets and liabilities were recorded at their estimated fair values in the Company's Consolidated Balance Sheets as of June 1, 2020. See "Note 9 – Business Combination" for additional information on the Mergers.

Xperi Holding Corporation is a leading consumer and entertainment product/solutions licensing company and one of the industry's largest intellectual property (IP) licensing platforms, with a diverse portfolio of media and semiconductor intellectual property and more than 11,000 patents and patent applications worldwide. The Company invents, develops, and delivers technologies that enable extraordinary experiences. The Company's technologies, delivered via its brands (DTS, HD Radio, IMAX Enhanced, Invensas, and TiVo), and by its subsidiary, Perceive Corporation, make entertainment more entertaining, and smart devices smarter. The Company's technologies are integrated into billions of consumer devices, media platforms, and semiconductors worldwide, driving increased value for customers, partners and consumers. The Company shapes how millions of consumers access and experience entertainment content, and the Company's innovations are found in billions of devices and hundreds of millions of interfaces around the globe.

The Company has two principal segments, a product segment and an IP licensing segment. The Product segment consists primarily of licensing Company-developed audio, digital radio, imaging, edge-based machine learning and multi-channel video user experience ("UX") solutions. Audio, digital radio, imaging solutions and edge-based machine learning include the delivery of software and/or hardware-based solutions to the Company's consumer electronics ("CE") customers, automotive manufacturers or their supply chain partners. UX products and services revenue is primarily derived from multi-channel video service providers and CE manufacturers, licensing the TiVo service and selling TiVo-enabled devices like the Stream 4K, Personalized Content Discovery, enriched Metadata, viewership data and advertising.

The IP Licensing segment consists primarily of licensing the Company's innovations to leading companies in the media and semiconductor industries. Licensing arrangements include access to one or more of the Company's foundational patent portfolios and may also include access to some of its industry-leading technologies and proven know-how. In media, the Company's licensees include multichannel video programming distributors (MVPDs), over-the-top (OTT) video service providers, consumer electronics manufacturers, social media, and other new media companies. In semiconductor, the Company's licensees include memory, sensors, RF component, and foundry companies.

The consolidated financial statements include the accounts of Xperi Holding Corporation, its wholly owned subsidiaries, and a majority-owned subsidiary. In the fourth quarter of 2018, the Company funded a new subsidiary, Perceive Corporation ("Perceive"), which was created to focus on delivering edge inference solutions. As of December 31, 2020, the Company owned approximately 81% of Perceive. The operating results of Perceive have been consolidated in the Company's consolidated financial statements since the fourth quarter of 2018. The accompanying consolidated financial statements have been prepared in accordance with generally accepted accounting principles ("GAAP") in the United States ("U.S."). All significant intercompany balances and transactions are eliminated in consolidation.

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

Reclassification

As a result of the Mergers, certain reclassifications of prior period amounts have been made to improve comparability and conform to the current period presentation. Presentation changes were made to the Consolidated Statements of Operations. In addition, certain reclassifications of prior period data have been made in the Notes to Consolidated Financial Statements to conform to the current period presentation.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. The accounting estimates and assumptions that require management's most significant, challenging, and subjective judgment include the estimation of licensees' quarterly royalties prior to receiving the royalty reports, the determination of stand-alone selling price and the transaction price in an arrangement with multiple performance obligations, the estimation of variable consideration, judgment used to estimate the progress toward completion in the Company's engineering services, the collectability of accounts receivable, other intangible assets and investments, the assessment of the recoverability of goodwill, the assessment of useful lives and recoverability of other intangible assets and long-lived assets, recognition and measurement of current and deferred income tax assets and liabilities, the assessment of unrecognized tax benefits, and purchase accounting resulting from business combinations, among others. Actual results experienced by the Company may differ from management's estimates.

The COVID-19 pandemic has resulted in a global slowdown of economic activity which is likely to reduce the future demand for a broad variety of goods and services, while also disrupting sales channels, marketing activities and supply chains for an unknown period of time until the virus is fully contained. The Company's business operations have been negatively impacted by the COVID-19 pandemic and related events and the Company expects this disruption to continue to have a negative impact on its revenue and results of operations, the size and duration of which is currently difficult to predict. The impact to date has included a decline in demand in various markets and industries, particularly the automotive market. Although the Company is unable to predict the full impact and duration of COVID-19 on its business, the Company is actively managing its financial expenditures in response to the current uncertainty.

The impact of the COVID-19 pandemic and related events, including actions taken by various government authorities in response, have increased market volatility and make the estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes more difficult. As of the date of issuance of the financial statements, the Company is not aware of any specific event or circumstance that would require it to update its estimates, judgments or revise the carrying value of its assets or liabilities. These estimates may change, as new events occur and additional information is obtained, and are recognized in the consolidated financial statements as soon as they become known.

Revenue Recognition

Revenue is recognized when control of the promised goods or services is transferred to a customer in an amount that reflects the consideration the Company expects to receive in exchange for those goods or services, which may include various combinations of goods and services which are generally capable of being distinct and accounted for as separate performance obligations. See "Note 4 – *Revenue"* for a detailed discussion on revenue and revenue recognition.

Cash and Cash Equivalents

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

Short-term Investments

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

Marketable Debt Securities

The Company classifies its debt securities as available-for-sale ("AFS"), which are accounted for at fair value. For AFS debt securities in an unrealized loss position, the Company first assesses whether it intends to sell, or it is more-likely-than-not that it will be required to sell the security before recovery of its amortized cost basis. If either of the criteria regarding intent or requirement to sell is met, the security's amortized cost basis is written down to fair value through income. For AFS debt securities that do not meet the aforementioned criteria, the Company evaluates whether the decline in fair value has resulted from credit losses or other factors. In making this assessment, the Company considers the extent to which fair value is less than amortized cost, any changes to the rating of the security by a rating agency, and adverse conditions specifically related to the security, among other factors. If this assessment indicates that a credit loss exists, the present value of cash flows expected to be collected from the security are compared to the amortized cost basis of the security. If the present value of cash flows expected to be collected is less than the amortized cost basis, a credit loss exists and an allowance for credit losses is recorded for the credit loss, limited by the amount that the fair value is less than the amortized cost basis. Any impairment that has not been recorded through an allowance for credit losses is recognized in accumulated other comprehensive income or loss on the Consolidated Balance Sheets.

Marketable Equity Securities

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

Non-Marketable Equity Investments

Investments in non-marketable equity securities are accounted for using either the equity method or the cost method. Investments in entities over which the Company has the ability to exercise significant influence, but does not hold a controlling interest, are accounted for using the equity method. Under the equity method, the Company records its proportionate share of income or loss in other income and expense, net, in the Consolidated Statements of Operations. Investments in entities over which the Company does not have the ability to exercise significant influence are accounted for using the cost method. The Company monitors its non-marketable securities portfolio for potential impairment. When the carrying amount of an investment in a non-marketable security exceeds its fair value and the decline in fair value is determined to be other-than-temporary, the loss is recorded in other income and expense, net, in the Consolidated Statements of Operations.

Fair Value of Financial Instruments

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The carrying amount of cash equivalents, accounts receivable, accounts payable and accrued liabilities approximates fair value due to the short-term nature of these instruments. Long-term debt is carried at amortized cost and measured at fair value on a quarterly basis for disclosure purposes. See "Note 7 – *Fair Value"* for further information.

Concentration of Credit and Other Risks

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

At December 31, 2020, the Company had two customers representing 17% and 11% of aggregate trade receivables, respectively. At December 31, 2019, the Company had three customers representing 17%, 14% and 11% of aggregate trade receivables, respectively.

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

	Years Ended December 31,		
	2020	2019	2018
Comcast Corporation	27%	*	*
SK hynix Inc.	*	17%	12%
Intel Corporation	*	11%	*
Samsung Electronics, Co. Ltd.	*	*	38%

* denotes less than 10% of total revenue.

The Company's TiVo service is enabled using a DVR manufactured by a third-party. The Company also outsources to third parties certain supply-chain activities related to inventory warehousing, order fulfillment, distribution and other direct sales logistics. The Company cannot be sure that these parties will perform their obligations as expected or that any revenue, cost savings or other benefits will be derived from the efforts of these parties. If any of these parties breaches or terminates their agreement with the Company or otherwise fails to perform their obligations in a timely manner, the Company may be delayed or prevented from commercializing its products and services.

Allowance for Credit Losses

The allowance for credit losses, which includes the allowance for accounts receivable and unbilled contracts receivable, represents the Company's best estimate of lifetime expected credit losses inherent in those financial assets. The Company's lifetime expected credit losses are determined using relevant information about past events (including historical experience), current conditions, and reasonable and supportable forecasts that affect collectability. The Company monitors its credit exposure through ongoing credit evaluations of its customers' financial condition and limits the amount of credit extended when deemed necessary. In addition, the Company performs routine credit management activities such as timely account reconciliations, dispute resolution, and payment confirmations. The Company may employ collection agencies and legal counsel to pursue recovery of defaulted receivables. See "Note 4 – Revenue" for a further discussion of the allowance for credit losses.

Inventory

Inventories consist primarily of finished DVRs, non-DVRs, including TiVo Stream 4K, and accessories and are stated at the lower of cost or net realizable value on an aggregate basis. Cost is computed using standard cost, which approximates actual cost on a first-in, first-out basis. Adjustments to reduce the carrying amount of inventory to the lower of cost or net realizable value are made, if required, for excess or obsolete goods, which includes a review of, among other factors, demand requirements and market conditions.

Business Combinations

The Company accounts for business combinations using the acquisition method of accounting in accordance with ASC 805, "Business Combinations." Identifiable assets acquired and liabilities assumed are recorded at their acquisition date fair values. The excess of the fair value of purchase consideration over the fair values of these identifiable assets and liabilities is recorded as goodwill. Acquisition related costs are expensed as incurred. Upon acquisition, the accounts and results of operations are consolidated as of and subsequent to the acquisition date.

When determining the fair values of assets acquired and liabilities assumed, management makes significant estimates and assumptions, especially with respect to intangible assets. The Company utilizes commonly accepted valuation techniques, such as the income approach and the cost approach, as appropriate, in establishing the fair value of intangible assets. Typically, key assumptions include projections of cash flows that arise from identifiable intangible assets of acquired businesses as well as discount rates based on an analysis of the weighted average cost of capital, adjusted for specific risks associated with the assets. See "Note 9 – *Business Combination"* for additional detail.

Goodwill and Identified Intangible Assets

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

If, based on the qualitative assessment, it is determined that it is more likely than not that the fair value of a reporting unit is less than its carrying amount, then the Company proceeds to perform the quantitative goodwill impairment test. The Company first determines the fair value of a reporting unit using weighted results derived from an income approach and a market approach. The fair value using an income approach is estimated through the discounted cash flow method based on assumptions about future conditions such as revenue growth rates, operating expenses, EBITDA, discount rates, and other assumptions. Market approaches used by management include the market comparable method, which estimates the fair value based on revenue multiples from comparable companies in similar lines of business, and the market transaction method, which estimates the fair value of the reporting unit by utilizing comparable transactions and transaction multiples. The Company then compares the derived fair value of a reporting unit with its carrying amount. If the carrying value of a reporting unit exceeds its fair value, an impairment loss will be recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit.

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

Identified indefinite-lived intangible assets include TiVo tradenames and trademarks resulting from business combinations. The Company evaluates the carrying value of indefinite-lived intangible assets on an annual basis, and an impairment charge would be recognized to the extent that the carrying amount of such assets exceeds their estimated fair value.

For further discussion of goodwill and identified intangible assets, see "Note 10 – *Goodwill and Identified Intangible Assets*."

Debt Discount and Issuance Costs

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

Treasury Stock

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

Leases

The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, accrued liabilities, and noncurrent operating lease liabilities in the Company's consolidated balance sheets. The ROU assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the

Company’s obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As most of the leases do not provide an implicit rate, the Company generally uses its incremental borrowing rate based on the estimated rate of interest for collateralized borrowing over a similar term of the lease payments at commencement date. The Company’s lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Lease expense for lease payments is recognized on a straight-line basis over the lease term. As a practical expedient, the Company elected, for all office and facility leases, not to separate nonlease components from lease components and instead to account for each separate lease component and its associated non-lease components as a single lease component. For additional information regarding the Company's leases, refer to “Note 8 – *Leases.”*

Research, Development and Other Related Costs

Research, development (“R&D”) and other related costs are comprised primarily of employee-related costs, stock-based compensation expense, engineering consulting expenses associated with new product and technology development, product commercialization, quality assurance and testing costs, as well as costs related to patent applications and examinations, product "tear downs" and reverse engineering, materials, supplies, equipment depreciation and an allocation of facilities costs. All research, development and other related costs are expensed as incurred.

Stock-based Compensation Expense

Stock-based compensation is measured at the grant date based on the estimated fair value of the award and is recognized as expense on a straight-line basis, net of estimated forfeitures, over the requisite service or performance period. Forfeiture rates are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. If the actual forfeiture rate is materially different from the estimate, stock-based compensation expense could be significantly different from what was recorded in the current period.

The Company uses the closing trading price of its common stock on the date of grant as the fair value of awards of restricted stock units (“RSUs”), and performance stock units (“PSUs”) that are based on company-designated performance targets. For performance stock units that are based on market conditions, or market-based PSUs, fair value is estimated by using a Monte Carlo simulation on the date of grant. The Company estimates the grant-date fair value of stock options and stock to be issued under the employee stock purchase plan (“ESPP”) using the Black-Scholes pricing model. See “Note 14 – Stock-based Compensation Expense” for additional detail.

Performance-based PSU awards will vest if certain employee-specific or company-designated performance targets are achieved. If minimum performance thresholds are achieved, each PSU award will convert into the Company’s common stock at a defined ratio depending on the degree of achievement of the performance target designated by each individual award. If minimum performance thresholds are not achieved, then no shares will be issued. The expected levels of achievement are reassessed over the requisite service periods and, to the extent that the expected levels of achievement change, stock-based compensation is adjusted in the period of change and recorded on the statements of operations and the remaining unrecognized stock-based compensation is recorded over the remaining requisite service period. For market-based PSUs, the fair value per award is fixed at the grant date and the amount of compensation expense is not adjusted during the performance period regardless of changes in the level of achievement of the market condition unless it is due to termination.

Income Taxes

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

The provision for income taxes was comprised of the Company’s current tax liability and changes in deferred income tax assets and liabilities. The calculation of the current tax liability involves dealing with uncertainties in the application of complex tax laws and regulations and in determining the liability for tax positions, if any, taken on the Company’s tax returns in accordance with authoritative guidance on accounting for uncertainty in income taxes. Deferred income taxes are determined based on the differences between the financial reporting and tax basis of assets and liabilities. The Company must assess the likelihood that it will be able to recover the Company’s deferred tax assets. If recovery is not likely on a more-likely-than-not basis, the Company must increase its provision for income taxes by recording a valuation allowance against the deferred tax assets that it estimates will not ultimately be recoverable. However, should there be a change in the Company’s ability to recover its deferred tax assets, the provision for income taxes would fluctuate in the period of such change. See “Note 15 – *Income Taxes”* for additional detail.

Advertising Costs

Advertising costs are expensed as incurred and are presented within selling, general and administrative expense in the Consolidated Statements of Operations. Advertising expenses for the years ended December 31, 2020, 2019 and 2018, were $11.4 million, $5.0 million and $5.0 million, respectively.

Indemnification

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

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

Contingencies

From time to time, the Company may be involved in legal and administrative proceedings and claims of various types. The Company records a liability in its consolidated financial statements for these matters when a loss is known or considered probable and the amount can be reasonably estimated. Management reviews these estimates in each accounting period as additional information becomes known and adjusts the loss provision when appropriate. If the loss is not probable or cannot be reasonably estimated, a liability is not recorded in the consolidated financial statements. If a loss is probable but the amount of loss cannot be reasonably estimated, the Company discloses the loss contingency and an estimate of possible loss or range of loss (unless such an estimate cannot be made). The Company does not recognize gain contingencies until they are realized. Legal costs incurred in connection with loss contingencies are expensed as incurred. See "Note 16 – *Commitments and Contingencies*," for further information regarding the Company's pending litigation.

Property and Equipment

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

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

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

Foreign Currency Translation

The Company predominantly uses the U.S. dollar as its functional currency. Certain non-U.S. subsidiaries designate a local currency as their functional currency. The translation of assets and liabilities into U.S. dollars for subsidiaries with a functional currency other than the U.S. dollar is performed using exchange rates in effect at the balance sheet date. The translation of revenues and expenses into U.S. dollars for subsidiaries with a functional currency other than the U.S. dollar is performed using the average exchange rate for the respective period. Gains or losses from cumulative translation adjustments, net of tax, are included as a component of accumulated other comprehensive income (loss) in the Consolidated Balance Sheets. The Company records net foreign exchange transaction gains and losses resulting from the conversion of the transaction currency to the functional currency within other income and expense, net.

NOTE 3 – RECENT ACCOUNTING PRONOUNCEMENTS

Recently Adopted Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued ASU No. 2014-09 (Topic 606) "Revenue from Contracts with Customers." Topic 606 supersedes the revenue recognition requirements in Topic 605 "Revenue Recognition" (Topic 605), and requires entities to recognize revenue when control of goods or services is transferred to customers at an amount that reflects the consideration to which the entity expects to be entitled in exchange for the goods or services. On January 1, 2018, the Company adopted the new standard using the modified retrospective method, under which the Company recorded a $224 million cumulative net of tax adjustment to the opening balance of retained earnings on January 1, 2018. The adjustment was determined by measuring the impact of the new standard on existing contracts that were not completed as of December 31, 2017. Prior period comparative information has not been restated and continues to be reported under Topic 605 in effect for those periods. This new standard had a material impact on the Company's revenue and its consolidated statement of operations and balance sheet as of and for the year ended December 31, 2018, and is expected to have a material impact on an ongoing basis, with no impact on the timing of customer billings or on cash flows. See "Note 4 – Revenue" for further discussion.

In February 2016, the FASB issued ASU No. 2016-02, "*Leases*" (Topic 842), which generally requires companies to recognize operating and financing lease liabilities and corresponding right-of-use (ROU) assets on the balance sheet. Under the standard, disclosures are required to meet the objective of enabling users of financial statements to assess the amount, timing, and uncertainty of cash flows arising from leases. On January 1, 2019, the Company adopted the new standard using the modified retrospective transition approach and elected the transition option, under which the Company initially applied the transition requirements to all leases that existed at December 31, 2018, with any residual effects of initially applying Topic 842 recognized as a cumulative effect adjustment to the opening balance of retained earnings on January 1, 2019.

The Company elected the package of practical expedients permitted under the transition guidance within the new standard, which among other things, allowed it to carry forward the historical lease classification. Under the optional transition method, the Company opted to continue to apply the legacy guidance in ASC 840, Leases, including its disclosure requirements, in the comparative periods presented in the year it adopted the new leases standard, and therefore did not restate prior period results.

The most significant impact from adopting Topic 842 was the initial recognition of operating lease ROU assets and operating lease liabilities of $17.6 million and $18.8 million, respectively, as of January 1, 2019. Operating lease liabilities consist of both current and noncurrent portions with the current portion included in the balance of accrued liabilities. The standard did not materially impact the Company's Consolidated Statements of Operations and had no impact on cash flows.

In September 2016, the FASB issued ASU No. 2016-13, "*Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*" ("ASU 2016-13"), which introduces an approach based on expected losses to estimate credit losses on certain types of financial instruments. The current expected credit loss model is based on relevant information about past events, including historical experience, current conditions and reasonable and supportable forecasts that affect collectability. Current expected credit losses, and subsequent adjustments, represent an estimate of lifetime expected credit losses that are recorded as an allowance deducted from the amortized cost of the financial instrument. The updated guidance also amends the other-than-temporary impairment model for available-for-sale debt securities by requiring the recognition of impairments for credit-related losses through an allowance and eliminating the length of time a security has been in an unrealized loss position as a consideration in the determination of whether a credit loss exists. On January 1, 2020, the Company adopted the new standard using a modified retrospective transition approach for the provisions related to application of the current expected credit loss model to financial instruments and using a prospective transition approach for the provisions related to credit losses on available-for-sale debt securities. The adoption of this standard did not have a material impact on the Company's consolidated financial statements. For additional detail, refer to "Note 4 – *Revenue*."

In August 2018, the FASB issued ASU 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*" ("ASU 2018-15") modifying the requirements for capitalizing costs incurred to implement a hosting arrangement that is a service contract. The modified requirements were intended to align the cost capitalization requirements for hosting arrangements with the cost capitalization requirements for internal-use software. The Company adopted the standard on January 1, 2020 and applied the modified requirements prospectively to all implementation costs incurred after the date of adoption. The adoption did not have a material impact on the Company's consolidated financial statements.

Recent Accounting Pronouncements

In December 2019, the FASB released ASU 2019-12, "Simplifying the Accounting for Income Taxes" ("ASU 2019-12"). The purpose of the update is to reduce the complexity pertaining to certain areas in accounting for income taxes. Key amendments from ASU 2019-12 include, but are not limited to, the accounting for hybrid tax regimes, step-up in tax basis for goodwill in non-business combination transactions, intraperiod tax allocation exception to the incremental approach, and interim period accounting for enacted changes in tax law. ASU 2019-12 is effective for the Company in the first quarter of the year ending December 31, 2021. The Company does not expect that the adoption of the standard will have a material impact on its consolidated financial statements.

In March 2020, the FASB issued ASU 2020-04, Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting ("ASU 2020-04"). ASU 2020-04 provides optional expedients and exceptions for applying GAAP to contracts, hedging relationships, and other transactions affected by reference rate reform if certain criteria are met. The amendments in ASU 2020-04 apply only to contracts, hedging relationships, and other transactions that reference the London Interbank Offered Rate ("LIBOR") or another reference rate expected to be discontinued because of reference rate reform. ASU 2020-04 is effective beginning on March 12, 2020 and may be applied prospectively through December 31, 2022. The Company is currently assessing the potential impact of the standard on its consolidated financial statements.

NOTE 4 – REVENUE

Revenue Recognition

General

Revenue is recognized when control of the promised goods or services is transferred to a customer in an amount that reflects the consideration the Company expects to receive in exchange for those goods or services, which may include various combinations of goods and services which are generally capable of being distinct and accounted for as separate performance obligations. Revenue is recognized net of sales taxes collected from customers which are subsequently remitted to governmental authorities. In situations where foreign withholding taxes are withheld by the Company's licensee, revenue is recognized gross of withholding taxes that are remitted directly by the licensee to a local tax authority.

Arrangements with Multiple Performance Obligations

Some of the Company's contracts with customers contain multiple performance obligations. For these contracts, the individual performance obligations are separately accounted for if they are distinct. In an arrangement with multiple performance obligations, the transaction price is allocated among the separate performance obligations on a relative stand-alone selling price basis. The determination of stand-alone selling price considers market conditions, the size and scope of the contract, customer and geographic information, and other factors. When observable prices are not available, stand-alone selling price for separate performance obligations is based on the cost-plus-margin approach, considering overall pricing objectives. The allocation of transaction price among performance obligations in a contract may impact the amount and timing of revenue recognized in the Consolidated Statements of Operations during a given period.

Contract Modifications

Contracts may be modified due to changes in contract specifications or customer requirements. Contract modifications occur when the change in terms either creates new enforceable rights and obligations or changes existing enforceable rights and obligations. The effect of a contract modification for goods and services that are not distinct in the context of the contract on the transaction price is recognized as an adjustment to revenue on a cumulative catch-up basis. Contract modifications that result in goods or services that are distinct from the existing goods or services are accounted for as separate contracts if they are sold at their stand-alone selling price, or otherwise prospectively.

Variable Consideration

When a contract with a customer includes a variable transaction price, an estimate of the consideration which the Company expects to be entitled to for transferring the promised goods or services is made at contract inception. Depending on the terms of the contract, variable consideration is estimated using either the expected value approach or the most likely value approach. Under either approach to estimating variable consideration, the estimate considers all information (historical, current and forecast) that is reasonably available at contract inception. The amount of variable consideration is estimated at contract inception and updated as additional information becomes available. The estimate of variable consideration is included in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Subsequent changes in the transaction price resulting from changes in the estimate of variable consideration are allocated to the performance obligations in the contract on the same basis

as at contract inception. Certain payments to licensees, retailers and distributors, such as market development funds and revenue shares, are treated as a reduction of the transaction price, and therefore a reduction to revenue, unless the payment is in exchange for a distinct good or service that the licensee, retailer or distributor transfers to the Company.

When variable consideration is in the form of a sales-based or usage-based royalty in exchange for a license of IP, or when a license of IP is the predominant item to which the variable consideration relates, revenue is recognized at the later of when the subsequent sale or usage occurs or the performance obligation to which some or all of the sales-based or usage-based royalty has been allocated has been satisfied or partially satisfied.

Nature of Goods and Services

The following is a discussion of the principal activities from which the Company generates its revenue.

License Agreements

The Company operates in two business segments. In its Product segment, the Company licenses its audio, digital radio, imaging, edge-based machine learning and multi-channel video user experience (“UX”) solutions. Within this segment, the Company groups its business into three categories based on the products delivered and customers served: Consumer Experience, Connected Car, and Pay-TV. In its IP Licensing segment, the Company licenses (i) its media patent portfolios (“Media IP licensing”) to multichannel video programming distributors, over-the-top video service providers, consumer electronics manufacturers, social media, and other new media companies and (ii) its semiconductor technologies and associated patent portfolios (“Semiconductor IP licensing”) to memory, sensors, RF component, and foundry companies.

The Company licenses its technologies and portfolios under three revenue models: (i) fixed-fee Media IP licensing, (ii) fixed-fee or minimum guarantee Product or Semiconductor IP licensing, and (iii) per-unit or per-subscriber royalty licenses.

Fixed-fee Media IP licensing

The Company's long-term fixed-fee Media IP licensing agreements, which are related to the TiVo businesses following the Mergers, provide its customers with rights to future patented technologies over the term of the agreement that are highly interdependent or highly interrelated to the patented technologies provided at the inception of the agreement. The Company treats these rights as a single performance obligation with revenue recognized on a straight-line basis over the term of the fixed-fee license agreement.

At times, the Company enters into license agreements in which a licensee is released from past patent infringement claims or is granted a license to ship an unlimited number of units or for an unlimited number of subscribers over a future period for a fixed fee. In these arrangements, the Company allocates the transaction price between the release for past patent infringement claims and the future license. In determining the stand-alone selling price of the release for past patent infringement claims and the future license, the Company considers such factors as the number of units shipped in the past or the number of past subscribers and the relevant geographies of the shipped units or subscribers, the future number of subscribers or units, as well as the licensing rate the Company generally receives for per-subscriber or units shipped in the same geographies. As the release from past patent infringement claims is generally satisfied at execution of the agreement, the transaction price allocated to the release from past patent infringement claims is generally recognized in the period the agreement is executed and the amount of transaction price allocated to the future license is recognized ratably over the future license term.

Fixed-fee or minimum guarantee Semiconductor IP or Product licensing

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

If the contract term of a fixed fee or minimum guarantee arrangement is longer than one year, the Company also considers the scheduled payment arrangements to determine whether a significant financing component exists. In general, if the payment arrangements extend beyond the initial twelve months of the contract, the Company treats a portion of the payments as a significant financing component. The discount rate used for each arrangement reflects the rate that would be used in a separate financing transaction between the Company and the licensee at contract inception and takes into account the credit

characteristics of the licensee and market interest rates as of the date of the agreement. As such, the amount of fixed fee revenue recognized at the beginning of the license term will be reduced by the calculated financing component. As payments are received from the licensee, the Company recognizes a portion of the financing component as interest income, reported as other income and expense in the Consolidated Statements of Operations.

Per-unit or per-subscriber royalty licenses

The Company recognizes revenue from per-unit or per-subscriber royalty licenses in the period in which the licensee's sales or production are estimated to have occurred, which results in an adjustment to revenue when actual sales or production are subsequently reported by the licensee, which is generally in the month or quarter following usage or shipment. The Company generally recognizes revenue from royalty licenses on a per-subscriber per-month model for licenses with service providers and a per-unit shipped or manufactured model for licenses with CE manufacturers and memory, sensors, RF component, and foundry companies.

Compliance Audits

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

Arrangements with Multiple System Operators for the TiVo Service

The Company's arrangements with multiple system operators (“MSOs”) typically include software customization and set-up services, associated maintenance and support, limited training, post-contract support, TiVo-enabled DVRs, non-DVR Set-Top Boxes (“STBs”), and the TiVo service.

The Company has two types of arrangements with MSOs that include technology deployment and engineering services. In instances where the Company hosts the TiVo service, non-refundable payments received for customization and set-up services are deferred and recognized as revenue ratably over the hosting term. The related cost of such services is capitalized to the extent it is deemed recoverable and amortized to cost of revenue over the same period as the related TiVo service revenue is recognized. The Company estimates the stand-alone selling prices for training, DVRs, non-DVR STBs and maintenance and support based on the price charged in stand-alone sales of the promised good or service. The stand-alone selling price for the TiVo service is determined by considering the size of the MSO and expected volume of deployment, market conditions, competitive landscape, internal costs and total gross margin objectives. For a term license to the TiVo service, the Company receives license fees for the hosted TiVo service on either a per-subscriber per-month basis or a fixed fee. The Company recognizes revenue from per-subscriber per-month licenses during the month the TiVo service is provided to the customer and recognizes revenue from fixed fee licenses ratably over the license period.

In arrangements where the Company does not host the TiVo service, which includes engineering services that are essential to the functionality of the licensed technology or involve significant customization or modification of the software, the Company recognizes revenue as progress toward completion is made using an input method based on the ratio of costs incurred to date to total estimated costs of the project. Project costs are primarily labor related to specific activities required for the project. Costs related to general infrastructure or uncommitted platform development are not included in the project cost estimates and are expensed as incurred. Estimating project costs requires forecasting costs, tracking progress toward completion and projecting the remaining effort to complete the project. These estimates are reassessed throughout the term of the arrangement, and revisions to estimates are recognized on a cumulative catch-up basis when the changed conditions become known. Provisions for losses are recorded when estimates indicate it is probable that a loss will be incurred for the contract. The Company generally recognizes revenue from license fees for the TiVo service that the Company does not host on a per-subscriber per-month basis due to the recognition constraint on intellectual property usage-based royalties.

Subscription Services

Subscription services revenue primarily consists of fees to provide customers with access to one or more of the Company's hosted products such as its iGuide interactive program guide (“IPG”), advanced search and recommendations, metadata and analytics products, including routine customer support. The Company generally receives per-subscriber per-month fees for its

iGuide IPG and search and recommendations service and revenue is recorded in the month the customer uses the service. The Company generally receives a monthly or quarterly fee from its metadata or analytics licenses for the right to use the metadata or access its analytics platform and to receive regular updates. Revenue from the Company's metadata and analytics service is recognized ratably over the subscription period.

TiVo-enabled DVRs and non-DVRs, including TiVo Stream 4K, and related TiVo Service

The Company sells TiVo-enabled DVRs and non-DVRs and the related service directly to customers through sales programs via the TiVo.com website and licenses the sale of TiVo-enabled DVRs and non-DVRs through a limited number of retailers. All customers have the right to cancel their subscription to the TiVo service within 30 days of subscription activation for a full refund. After the initial subscription period for a DVR, all customers have various pricing options when they renew their subscription.

The transaction price allocated to the DVR and non-DVR is recognized as revenue upon shipment to the customer and the transaction price allocated to the TiVo service is recognized as revenue ratably over the service period. Subscription revenue from lifetime subscriptions are recognized ratably over the estimated useful life of the DVR or non-DVR associated with the subscription. The estimated useful life for a DVR and non-DVR depends on a number of assumptions, including, but not limited to, customer retention rates, the timing of new product introductions and historical experience. The Company periodically reassesses the estimated useful life of DVRs and non-DVRs. When the actual useful life of a DVR or a non-DVR materially differs from the Company's estimate, the estimated useful life of the DVR or non-DVR is adjusted, which could result in the recognition of revenue over a longer or shorter period of time.

Significant Judgments

Determining whether promises to transfer multiple goods and services in contracts with customers are considered distinct performance obligations that should be accounted for separately requires significant judgment, including related to the level of integration and interdependency between the performance obligations. In addition, judgment is necessary to allocate the transaction price to the distinct performance obligations, including whether there is a discount or significant financing component to be allocated based on the relative stand-alone selling price of the various performance obligations.

Significant judgment is required to determine the stand-alone selling price for each distinct performance obligation when an observable price is not available. In instances where stand-alone selling price is not directly observable, such as when the Company does not sell the good or service separately, the stand-alone selling price is determined using a range of inputs that includes market conditions and other observable inputs. More than one stand-alone selling price may exist for individual goods and services due to the stratification of those goods and services, considering attributes such as the size of the customer and geographic region.

Due to the nature of the work required to be performed on some performance obligations, significant judgment may be required to determine the transaction price. It is common for the Company's license agreements to contain provisions that can either increase or decrease the transaction price. These variable amounts are generally estimated based on usage. In addition to estimating variable consideration, significant judgment is necessary to identify forms of variable consideration, determine whether the variable consideration relates to a sales-based or usage-based royalty of intellectual property and determine whether, and when to include estimates of variable consideration in the transaction price.

For certain licensees, royalty revenue is generated based on a licensee’s production or shipment of licensed products incorporating the Company’s intellectual property, technologies or software. Licensees with a per-unit or per-subscriber arrangement pay a per-unit royalty for each product manufactured or sold, or for each subscriber, as set forth in its license agreement. Licensees generally report manufacturing, sales or subscriber information in the month or quarter subsequent to when the production, shipment or subscription activity takes place. The Company estimates the royalties earned each quarter based on its forecast of manufacturing and sales activity by its licensees in that quarter. Any differences between actual royalties owed by a licensee and the Company’s estimate are recognized when the licensee’s royalty report is received. Estimating licensees’ quarterly royalties prior to receiving the royalty reports requires the Company to make significant assumptions and judgments related to forecasted trends and growth rates used to estimate quantities manufactured, shipped or subscribed by licensees, which could have a material impact on the amount of revenue recognized.

Some hardware products are sold with a right of return and, in certain circumstances, credits or incentives may be provided to customers or resellers at the time of sale. Such credits and incentives are accounted for as variable consideration and recognized as a reduction to revenue. Estimates of returns, credits and incentives are made at contract inception and updated each reporting period.

In contracts where the Company does not host the TiVo service and that include engineering services that are essential to the functionality of the licensed technology or involve significant customization or modification of software, or where the Company provides non-recurring engineering ("NRE") services, the Company recognizes revenue as progress toward completion occurs using an input method based on the ratio of costs incurred to date to total estimated costs of the project. Significant judgment is required to estimate the remaining effort to complete the project. These estimates are reassessed throughout the term of the arrangement.

Management evaluates its estimates, inputs and assumptions related to revenue recognition on an ongoing basis. The use of different estimates, inputs or assumptions may materially affect the reported amounts of assets and liabilities as of the date of the financial statements and the results of operations for the reporting period.

Practical Expedients and Exemptions

The Company applies a practical expedient to not perform an evaluation of whether a contract includes a significant financing component when the timing of revenue recognition differs from the timing of cash collection by one year or less.

The Company applies a practical expedient to expense costs to obtain a contract with a customer as incurred as a component of selling, general and administrative expenses when the amortization period would have been one year or less.

The Company applies a practical expedient when disclosing revenue expected to be recognized from unsatisfied performance obligations to exclude contracts with customers with an original duration of less than one year; contracts for which revenue is recognized based on the amount which the Company has the right to invoice for services performed and amounts attributable to variable consideration arising from (i) a sales-based or usage-based royalty of an intellectual property license or (ii) when variable consideration is allocated entirely to a wholly unsatisfied performance obligation; or to a wholly unsatisfied promise to transfer a distinct good or service that forms part of a single performance obligation.

Revenue Details

The following information depicts how the nature, amount, timing and uncertainty of revenue and cash flows are affected by economic factors by disaggregating revenue by product category/end market and geographic location (presented in "Note 17 - *Segment and Geographic Information*"). This information includes revenue recognized from contracts with customers and revenue from other sources, including past royalty revenues.

Revenue disaggregated by product category/end market was as follows (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Consumer Experience	$ 173,719	$ 116,130	$ 135,354
Pay-TV	131,920	—	—
Connected Car	70,462	81,994	82,995
Product revenue	376,101	198,124	218,349
IP Licensing revenue	515,919	81,943	187,784
Total revenue	$ 892,020	$ 280,067	$ 406,133

Contract Balances

Contracts Assets

Contract assets primarily consist of unbilled contracts receivable that are expected to be received from customers in future periods, where the revenue recognized to date (or cumulative adjustments to retained earnings in the initial period of adopting Topic 606) exceeds the amount billed. The amount of unbilled contracts receivable may not exceed their net realizable value and are classified as long-term assets if the payments are expected to be received more than one year from the reporting date. Contract assets also include the incremental costs of obtaining a contract with a customer, principally sales commissions when the renewal commission is not commensurate with the initial commission, and deferred engineering costs for significant software customization or modification and set-up services to the extent deemed recoverable.

Contract assets were recorded in the Consolidated Balance Sheets as follows (in thousands):

	December 31, 2020	December 31, 2019
Unbilled contracts receivable	$ 132,431	$ 121,826
Other current assets	1,208	—
Long-term unbilled contracts receivable	$ 6,761	26,672
Other long-term assets	2,591	—
Total contract assets	$ 142,991	$ 148,498

Contract Liabilities

Contract liabilities are mainly comprised of deferred revenue related to consumer lifetime subscriptions for the TiVo service, multi-period licensing or cloud-based services, and other offerings for which the Company is paid in advance while the promised good or service is transferred to the customer at a future date or over time. Deferred revenue also includes amounts received related to professional services to be performed in the future. Deferred revenue arises when cash payments are received, including amounts which are refundable, in advance of performance obligations being completed.

Allowance for Credit Losses

The allowance for credit losses, which includes the allowance for accounts receivable and unbilled contracts receivable, represents the Company’s best estimate of lifetime expected credit losses inherent in those financial assets. The Company’s lifetime expected credit losses are determined using relevant information about past events (including historical experience), current conditions, and reasonable and supportable forecasts that affect collectability. The Company monitors its credit exposure through ongoing credit evaluations of its customers’ financial condition and limits the amount of credit extended when deemed necessary. In addition, the Company performs routine credit management activities such as timely account reconciliations, dispute resolution, and payment confirmations. The Company may employ collection agencies and legal counsel to pursue recovery of defaulted receivables.

The Company’s long-term unbilled contracts receivable is derived from fixed-fee or minimum-guarantee Semiconductor IP or Product licensing arrangements, primarily with large well-capitalized companies. It is considered to be of high credit quality due to past collection history and the nature of the customers.

The following table presents the activity in the allowance for credit losses for the year ended December 31, 2020, 2019 and 2018 (in thousands):

	Years Ended December 31,					
	2020		2019		2018	
	Accounts Receivable	Unbilled Contracts Receivable	Accounts Receivable	Unbilled Contracts Receivable	Accounts Receivable	Unbilled Contracts Receivable
Beginning balance	$ 566	$ —	$ 779	$ —	$ 1,181	$ —
Provision for credit losses	7,418 *	2,231 *	(74)	—	417	—
Recoveries/charged-off	(648)	—	(139)	—	(819)	—
Balance at end of period	$ 7,336	$ 2,231	$ 566	$ —	$ 779	$ —

* The increase in provision for credit losses was based on assessment of current conditions including the COVID-19 pandemic and anticipation of delayed or delinquent payments on existing accounts receivable as a result of the declining financial health and liquidity positions of certain of the Company’s customers, as well as U.S. restrictions on trade with certain Chinese customers, and certain late payments and collection related issues.

Additional Disclosures

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

	Years Ended December 31,		
	2020	2019	2018
Revenue recognized in the period from:			
Amounts included in deferred revenue at the beginning of the period	$ 720	$ 3,130	$ 2,347
Amounts included in deferred revenue acquired from the Mergers	$ 20,271	$ —	$ —
Performance obligations satisfied in previous periods (true ups, licensee reporting adjustments and settlements) (1)	$ 296,031 (2)	$ 2,935	$ 1,323

(1) True ups represent the differences between the Company's quarterly estimates of per-unit royalty revenue and actual production/sales-based royalties reported by licensees in the following period. Licensee reporting adjustments represent corrections or revisions to previously reported per-unit royalties by licensees, generally resulting from the Company's inquiries or compliance audits. Settlements represent resolutions of litigation during the period for past royalties owed pursuant to expired or terminated IP license agreements.

(2) Includes past royalty revenue from Comcast Corporation ("Comcast"). On November 9, 2020, the Company entered into a patent license agreement (the "Agreement") with Comcast and the Company resolved all of the outstanding litigation with Comcast. The Agreement is effective as of the expiration of Comcast's prior agreement in 2016 and its term continues into 2031. In connection with the Agreement, the Company recorded revenue from past royalties in the fourth quarter of 2020 and expects to record revenue from the prospective license into 2031.

Remaining revenue under contracts with performance obligations represents the aggregate amount of the transaction price allocated to the performance obligations that are unsatisfied (or partially unsatisfied) under the Company's fixed-fee IP, software-as-a-service agreements and engineering services contracts.

The Company's remaining revenue under contracts with performance obligations was as follows (in thousands):

	December 31,	
	2020	2019
Revenue from contracts with performance obligations expected to be satisfied in:		
2021	$ 152,008	$ 5,337
2022	102,764	990
2023	91,636	345
2024	77,989	—
2025	76,028	—
Thereafter	429	—
Total	$ 500,854	$ 6,672

NOTE 5 – COMPOSITION OF CERTAIN FINANCIAL STATEMENT CAPTIONS

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

	December 31,	
	2020	2019
Prepaid income taxes	$ 4,654	$ 2,364
Prepaid expenses	20,393	8,802
Inventory	9,819	100
Other	5,897	2,469
	$ 40,763	$ 13,735

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

	December 31,	
	2020	2019
Equipment, furniture and other	$ 61,573	$ 32,504
Building and improvements	18,309	18,258
Land	5,300	5,300
Leasehold improvements	25,776	8,103
	110,958	64,165
Less: Accumulated depreciation and amortization	(47,751)	(31,288)
	$ 63,207	$ 32,877

Other long-term assets consisted of the following (in thousands):

	December 31,	
	2020	2019
Long-term deferred tax assets	$ 7,042	$ 3,660
Non-current income tax receivable (1)	122,993	64,570
Other assets	23,235	3,106
	$ 153,270	$ 71,336

(1) See “Note 15 - *Income Taxes*” for detailed information concerning the year-over-year changes.

Accrued liabilities consisted of the following (in thousands):

	December 31,	
	2020	2019
Employee compensation and benefits	$ 55,449	$ 18,404
Third-party royalties	5,906	6,165
Accrued expenses	24,809	7,930
Accrued severance	5,332	—
Current portion of operating lease liabilities	17,893	5,845
Other	19,646	3,089
	$ 129,035	$ 41,433

Other long-term liabilities consisted of the following (in thousands):

	December 31,	
	2020	2019
Long-term income tax payable	$ 94,397	$ 76,767
Other	4,556	131
	$ 98,953	$ 76,898

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

	December 31,	
	2020	2019
Unrealized gain (loss) on available-for-sale debt securities, net of tax	$ (81)	$ (53)
Foreign currency translation adjustment, net of tax	1,345	—
	$ 1,264	$ (53)

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

	Years Ended December 31,		
	2020	2019	2018
Interest income from significant financing components	$ 2,702	$ 5,762	$ 7,672
Interest income from investments	1,338	2,359	1,074
Realized and unrealized gain (loss) on marketable equity securities	(707)	10	(2,217)
Other income	1,122	897	2,066
	$ 4,455	$ 9,028	$ 8,595

NOTE 6 – FINANCIAL INSTRUMENTS

The Company has investments in debt securities which include corporate bonds and notes, treasury and agency notes and bills, commercial paper, certificates of deposit, and in equity securities consisting of money market funds. The Company classifies its debt securities as available-for-sale ("AFS"), which are accounted for at fair value with credit related losses recognized as a provision for credit losses in its Consolidated Statements of Operations and all non-credit related unrealized gains and losses recognized in accumulated other comprehensive income or loss on the Consolidated Balance Sheets. Under ASU 2016-01 (Topic 321), equity securities are measured at fair value with unrealized gains and losses recognized in other income and expense, net, in the Consolidated Statements of Operations.

The following is a summary of marketable securities at December 31, 2020 and December 31, 2019 (in thousands):

	December 31, 2020				
	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Allowance for Credit Losses	Estimated Fair Values
Marketable securities					
Corporate bonds and notes	$ 69,973	$ 29	$ (42)	$ —	$ 69,960
Commercial paper	15,991	—	(4)	—	15,987
Treasury and agency notes and bills	32,299	—	—	—	32,299
Total debt securities	118,263	29	(46)	—	118,246
Money market funds	3,849	—	—	—	3,849
Total equity securities	3,849	—	—	—	3,849
Total marketable securities	$ 122,112	$ 29	$ (46)	$ —	$ 122,095
Reported in:					
Cash and cash equivalents					$ 35,148
Available-for-sale debt securities (1)					86,947
Total marketable securities					$ 122,095

(1) Amortized cost related to the balance reported as AFS debt securities was $86,963.

	December 31, 2019			
	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Values
Marketable securities				
Corporate bonds and notes	$ 41,730	$ 29	$ (13)	$ 41,746
Commercial paper	4,052	4	—	4,056
Total debt securities	45,782	33	(13)	45,802
Money market funds	2,601	—	—	2,601
Marketable equity securities	3,405	—	(2,281)	1,124
Total equity securities	6,006	—	(2,281)	3,725
Total marketable securities	$ 51,788	$ 33	$ (2,294)	$ 49,527
Reported in:				
Cash and cash equivalents				$ 2,601
Available-for-sale debt securities				45,802
Equity securities				1,124
Total marketable securities				$ 49,527

At December 31, 2020 and December 31, 2019, the Company had $257.1 million and $121.5 million, respectively, in cash, cash equivalents and short-term investments. A significant portion of these amounts was held in marketable securities, as shown above. The remaining balance of $135.0 million and $72.0 million at December 31, 2020 and December 31, 2019, respectively, was cash held in operating accounts not included in the tables above.

Debt Securities

The gross realized gains and losses on sales of marketable debt securities were not significant during the years ended December 31, 2020, 2019 and 2018.

Unrealized losses on AFS debt securities were $0.1 million and $0.1 million, net of tax, as of December 31, 2020 and December 31, 2019, respectively. The Company evaluated whether the decline in fair value has resulted from credit losses or other factors and concluded these amounts were related to temporary fluctuations in value of AFS securities and were due primarily to changes in interest rates and market conditions of the underlying securities. In addition, the contractual terms of those investments do not permit the issuer to settle the securities at a price less than the amortized cost bases of the investments. The Company does not intend to sell the debt securities and it is more-likely-than-not that it will not be required to sell the investments before recovery of their amortized cost bases. The Company did not recognize a provision for credit loss expense related to its AFS debt securities for the year ended December 31, 2020. No impairment charges were recorded on the AFS debt securities for the years ended December 31, 2019 and 2018, respectively.

The following table summarizes the fair value and gross unrealized losses related to individual AFS debt securities at December 31, 2020 and 2019, which have been in a continuous unrealized loss position, aggregated by investment category and length of time (in thousands):

December 31, 2020	Less Than 12 Months		12 Months or More		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Corporate bonds and notes	$ 53,137	$ (42)	$ —	$ —	$ 53,137	$ (42)
Commercial paper	12,988	(4)	—	—	12,988	(4)
Total	$ 66,125	$ (46)	$ —	$ —	$ 66,125	$ (46)

December 31, 2019	Less Than 12 Months		12 Months or More		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Corporate bonds and notes	$ 20,031	$ (10)	$ 8,753	$ (3)	$ 28,784	$ (13)
Total	$ 20,031	$ (10)	$ 8,753	$ (3)	$ 28,784	$ (13)

The estimated fair value of marketable debt securities by contractual maturity at December 31, 2020 is shown below (in thousands). Actual maturities may differ from contractual maturities because issuers may have the right to call or prepay obligations without call or prepayment penalties.

	Estimated Fair Value
Due in one year or less	$ 77,263
Due in one to two years	40,983
Due in two to three years	—
Total	$ 118,246

Equity Securities

On September 19, 2018, the Company purchased seven million common shares of Onkyo Corporation ("Onkyo"), a publicly traded Japanese company and a long-standing customer of the Company, pursuant to the Capital Alliance Agreement ("Agreement") entered into between the two parties on September 3, 2018. Upon making the investment, the Company held a 6.3% ownership interest in Onkyo. Due to changes in business expectations, the Company determined not to continue discussions on the business alliance. In July 2019, the Company sold approximately 2.8 million shares of Onkyo stock, for which a realized gain of $0.9 million was recognized for the year ended December 31, 2019. In June 2020, the Company sold the remaining 4.2 million shares of Onkyo stock, for which a realized loss of $0.7 million was recognized for the year ended December 31, 2020. There were no sales of the Onkyo investment in 2018, during which period an unrealized loss of $2.2 million was recognized.

Non-marketable Equity Securities

Investments in non-marketable equity securities are accounted for using either the equity method or the cost method. Investments in entities over which the Company has the ability to exercise significant influence, but does not hold a controlling interest, are accounted for using the equity method. Under the equity method, the Company records its proportionate share of income or loss in other income and expense, net, in the Consolidated Statements of Operations. Investments in entities over which the Company does not have the ability to exercise significant influence are accounted for using the cost method. The Company monitors its non-marketable securities portfolio for potential impairment. When the carrying amount of an investment in a non-marketable security exceeds its fair value and the decline in fair value is determined to be other-than-temporary, the loss is recorded in other income and expense, net, in the Consolidated Statements of Operations.

Upon merging with TiVo on June 1, 2020, the Company assumed certain investments in non-marketable equity. As of December 31, 2020, other long-term assets included equity securities accounted for under the equity method with a carrying amount of $4.2 million and equity securities without a readily determinable fair value with a carrying amount of $0.1 million, respectively. No impairments or adjustments to the carrying amount of the Company's equity securities without a readily determinable fair value were recognized in the year ended December 31, 2020. The Company had no investments in non-marketable equity as of December 31, 2019.

Derivatives

In the first quarter of 2019, the Company began to use derivative financial instruments to manage foreign currency exchange rate risk. The Company does not enter into derivative transactions for trading purposes. Cash flows from the derivative programs are classified as cash flows from operating activities in the Consolidated Statements of Cash Flows.

The Company's derivative financial instruments consist of deliverable and non-deliverable foreign currency forward contracts, which are used primarily to hedge balance sheet and certain expenditure exposures. These instruments are generally short-term in nature, with typical maturities of less than one year, and are subject to fluctuations in foreign exchange rates. Fair values for derivative financial instruments are based on prices computed using third-party valuation models and are classified as Level 2 in accordance with the three-level hierarchy of fair value measurements. All significant inputs to the third-party valuation models are observable in active markets. Inputs include current market-based parameters such as forward rates, yield curves and credit default swap pricing. For additional information related to the three-level hierarchy of fair value measurements, see "Note 7 – Fair Value."

Under the Company's policy election, these derivatives are not designated as hedge instruments, and are measured and reported at fair value. Changes in the fair value of these undesignated derivatives are reported in other income and expense, net, on the Consolidated Statements of Operations. Realized gains or losses were not significant in the years ended December 31, 2020 and 2019, respectively. There were no derivative instruments outstanding as of December 31, 2020 and 2019, respectively. The Company did not engage in derivative contracts in 2018.

NOTE 7 – FAIR VALUE

The Company follows the authoritative guidance for fair value measurement and the fair value option for financial assets and financial liabilities. The Company carries its financial instruments at fair value with the exception of its long-term debt. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability, or an exit price, in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The established fair value hierarchy requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. There are three levels of inputs that may be used to measure fair value:

Level 1 Quoted prices in active markets for identical assets.

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

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

When applying fair value principles in the valuation of assets, the Company is required to maximize the use of quoted market prices and minimize the use of unobservable inputs. The Company calculates the fair value of its Level 1 and Level 2 instruments based on the exchange traded price of similar or identical instruments, where available, or based on other observable inputs. There were no significant transfers into or out of Level 1 or Level 2 that occurred between December 31, 2019 and December 31, 2020.

The following sets forth the fair value, and classification within the hierarchy, of the Company's assets required to be measured at fair value on a recurring basis as of December 31, 2020 (in thousands):

	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Marketable securities				
Money market funds - equity securities (1)	$ 3,849	$ 3,849	$ —	$ —
Corporate bonds and notes - debt securities (2)	69,960	—	69,960	—
Treasury and agency notes and bills - debt securities (3)	32,299	—	32,299	—
Commercial paper - debt securities (3)	15,987	—	15,987	—
Total Assets	$ 122,095	$ 3,849	$ 118,246	$ —

(1) Reported as cash and cash equivalents in the Consolidated Balance Sheet.
(2) Reported as AFS debt securities in the Consolidated Balance Sheet.
(3) Reported as cash and cash equivalents if purchased with an original maturity of three months or less at the date of purchase; otherwise reported as AFS debt securities in the Consolidated Balance Sheet.

The following sets forth the fair value, and classification within the hierarchy, of the Company's assets required to be measured at fair value on a recurring basis as of December 31, 2019 (in thousands):

	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Marketable securities				
Money market funds - equity securities (1)	$ 2,601	$ 2,601	$ —	$ —
Marketable equity securities (2)	1,124	1,124	—	—
Corporate bonds and notes - debt securities (3)	41,746	—	41,746	—
Commercial paper - debt securities (3)	4,056	—	4,056	—
Total Assets	$ 49,527	$ 3,725	$ 45,802	$ —

(1) Reported as cash and cash equivalents in the Consolidated Balance Sheet.
(2) Reported as equity securities in the Consolidated Balance Sheet.
(3) Reported as AFS debt securities in the Consolidated Balance Sheet.

Financial Instruments Not Recorded at Fair Value

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

	December 31, 2020		December 31, 2019	
	Carrying Amount	Estimated Fair Value	Carrying Amount	Estimated Fair Value
2020 Term B Loan Facility (1)	$ 839,302	$ 842,579	$ —	$ —
2021 Convertible Notes	48	48	—	—
2018 Amended Term B Loan (1)	—	—	334,679	335,642
Total long-term debt, net	$ 839,350	$ 842,627	$ 334,679	$ 335,642

(1) Carrying amounts of long-term debt are net of unamortized debt discount and issuance costs of $34.4 million and $9.3 million as of December 31, 2020 and 2019, respectively. See "Note 11 – *Debt*" for additional information.

If reported at fair value in the Consolidated Balance Sheets, the Company's debt would be classified within Level 2 of the fair value hierarchy. The fair value of the debt was estimated based on the quoted market prices for the same or similar issues.

Non-Recurring Fair Value Measurements

For purchase accounting related fair value measurements, see "Note 9 – Business Combination."

NOTE 8 - LEASES

Under Topic 842, a contract is a lease, or contains a lease, if the contract conveys the right to control the use of identified property, plant, or equipment (an identified asset) for a period of time in exchange for consideration. To determine whether a contract conveys the right to control the use of an identified asset for a period of time, an entity shall assess whether, throughout the period of use, the entity has both of the following: (a) the right to obtain substantially all of the economic benefits from use of the identified asset; and (b) the right to direct the use of the identified asset.

The Company leases office and research facilities, data centers and office equipment under operating leases which expire through 2029. The Company's leases have remaining lease terms of one year to nine years, some of which may include options to extend the leases for five years or longer, and some of which may include options to terminate the leases within the next 6 years or less. Leases with an initial term of 12 months or less are not recorded on the balance sheets; expense for these leases is recognized on a straight-line basis over the lease term. Variable lease payments are expensed as incurred and are not included within the lease liability and right-of-use assets calculation. As a practical expedient, the Company elected, for all office and

facility leases, not to separate nonlease components (e.g., common-area maintenance costs) from lease components (e.g., fixed payments including rent) and instead to account for each separate lease component and its associated non-lease components as a single lease component. As most of the leases do not provide an implicit rate, the Company generally, for purposes of discounting lease payments, uses its incremental borrowing rate based on the estimated rate of interest for collateralized borrowing over a similar term of the lease payments at commencement date.

The Company subleases certain real estate to third parties. The sublease portfolio consists of operating leases for previously exited office space. Certain subleases include variable payments for operating costs. The subleases are generally co-terminus with the head lease, or shorter. Subleases do not include any residual value guarantees or restrictions or covenants imposed by the leases. Income from subleases is recognized as a reduction to selling, general and administrative expenses.

The components of operating lease costs were as follows (in thousands):

	Years Ended December 31,		
	2020	**2019**	**2018**
Fixed lease cost (1)	$ 17,407	$ 6,876	$ 7,188
Variable lease cost	3,648	1,095	—
Less: sublease income	(5,423)	—	—
Total operating lease cost	$ 15,632	$ 7,971	$ 7,188

(1) Includes short-term leases costs, which were immaterial.

Other information related to leases was as follows (in thousands, except lease term and discount rate):

	Years Ended December 31,	
	2020	**2019**
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$ 16,770	$ 6,183
ROU assets obtained in exchange for new lease liabilities:		
Operating leases	$ 5,775	$ 5,612
	December 31, 2020	**December 31, 2019**
Weighted-average remaining lease term (years):		
Operating leases	5.1	4.6
Weighted-average discount rate:		
Operating leases	5.2%	5.7%

Future minimum lease payments and related lease liabilities as of December 31, 2020 were as follows (in thousands):

	Operating Lease Payments (1)	**Sublease Income**	**Net Operating Lease Payments**
2021	$ 21,825	$ (6,257)	$ 15,568
2022	18,420	(6,117)	12,303
2023	16,776	(6,231)	10,545
2024	15,719	(6,293)	9,426
2025	14,635	(6,279)	8,356
Thereafter	8,966	(935)	8,031
Total lease payments	96,341	(32,112)	64,229
Less: imputed interest	(12,205)	—	(12,205)
Present value of lease liabilities:	$ 84,136	$ (32,112)	$ 52,024
Less: current obligations under leases (accrued liabilities)	17,893		
Noncurrent operating lease liabilities	$ 66,243		

(1) Future minimum lease payments exclude short-term leases as well as payments to landlords for variable common area maintenance, insurance and real estate taxes.

As of December 31, 2019, future minimum lease payments were as follows (in thousands):

	Operating Leases
2020	$ 6,387
2021	4,558
2022	3,259
2023	3,235
2024	2,619
Thereafter	1,977
Total lease payments	22,035
Less: imputed interest	(2,776)
Present value of lease liabilities	$ 19,259
Less: current obligations under leases (accrued liabilities)	5,845
Noncurrent operating lease liabilities	$ 13,414

NOTE 9 – BUSINESS COMBINATION

Effective June 1, 2020, Xperi and TiVo completed the previously announced merger of equals transaction (the "Merger") contemplated by the Agreement and Plan of Merger and Reorganization, dated as of December 18, 2019, as amended on January 31, 2020, (the "Merger Agreement"), by and among Xperi, TiVo, XRAY-TWOLF HoldCo Corporation ("Xperi Holding"), XRAY Merger Sub Corporation ("Xperi Merger Sub") and TWOLF Merger Sub Corporation ("TiVo Merger Sub"). Immediately prior to the consummation of the Merger, Xperi Holding changed its name to "Xperi Holding Corporation" (the "Company"). Pursuant to the Merger Agreement, (i) Xperi Merger Sub was merged with and into Xperi, with Xperi surviving the merger as a subsidiary of Xperi Holding Corporation (the "Xperi Merger") and (ii) TiVo Merger Sub was merged with and into TiVo, with TiVo surviving the merger as a subsidiary of Xperi Holding Corporation (the "TiVo Merger" and together with the Xperi Merger, the "Mergers"). Immediately following the consummation of the Mergers, each of Xperi and TiVo became wholly-owned subsidiaries of the Company.

Upon completion of the Xperi Merger, each share of common stock, par value $0.001 per share, of Xperi (the "Xperi Common Stock") (excluding any shares of Xperi Common Stock that were held in treasury immediately prior to the effective time of the Xperi Merger, which were automatically canceled and retired for no consideration) was converted into the right to receive one fully paid and non-assessable share of common stock, par value $0.001 per share, of the Company ("Company Common Stock"). Upon completion of the TiVo Merger, (i) each share of common stock, par value $0.001 per share, of TiVo (the "TiVo Common Stock") (excluding any shares of TiVo Common Stock that were held in treasury immediately prior to the effective time of the TiVo Merger, which were automatically canceled and retired for no consideration) was converted into the right to receive 0.455 fully paid and non-assessable shares of common stock of the Company (the "Exchange Ratio"), in addition to cash in lieu of any fractional shares of the Company Common Stock.

As provided in the Merger Agreement, at the effective time of the Mergers, (i) all options, restricted shares, restricted stock unit awards and other equity awards relating to shares of Xperi Common Stock outstanding immediately prior to the effective time of the Mergers were generally automatically converted into options, restricted shares, restricted stock unit awards and other equity awards, respectively, relating to shares of Company Common Stock after giving effect to appropriate adjustments to reflect the Mergers and otherwise generally on the same terms and conditions as applied under the applicable plans and award agreements immediately prior to the effective time of the Mergers, and (ii) all options, restricted shares, restricted stock unit awards and other equity awards relating to shares of TiVo Common Stock that were outstanding immediately prior to the effective time of the Mergers (including Exchange Ratio) were generally automatically converted into options, restricted stock unit awards, restricted shares and other equity awards, respectively, relating to shares of Company Common Stock after giving effect to appropriate adjustments to reflect the Mergers and otherwise generally on the same terms and conditions as applied under the applicable plans and award agreements immediately prior to the effective time of the Mergers.

Following the Mergers, Xperi Common Stock and TiVo Common Stock were delisted from the Nasdaq Global Select Market ("Nasdaq") and deregistered under the Securities Exchange Act of 1934, as amended. Since June 2, 2020, the shares of the Company's common stock have been listed for trading on Nasdaq under the ticker symbol "XPER."

The Mergers created a leading consumer and entertainment product/solutions and IP licensing company. The Company's IP business includes one of the industry's largest and most successful IP portfolios licensed to a diverse base of customers. On the product side, the Company offers a seamless end-to-end entertainment experience from creation to consumption; with greater scale, technology depth and breadth, and a platform relevant to one of the biggest challenges consumers of entertainment face today – how to quickly and easily find, watch and enjoy entertainment.

The Company is currently contemplating and may pursue, subject to any required regulatory approvals, a separation of the Company's product business and IP licensing business through a tax-efficient transaction, resulting in two independent, publicly traded companies. The Company is currently evaluating the optimal timing of the contemplated business separation.

Merger Consideration

The merger consideration of $828.3 million was calculated as follows (amounts in thousands except exchange ratio and share price):

TiVo common shares outstanding as of June 1, 2020		128,132		
TiVo exchange ratio		0.455		
Xperi Holding Corporation common stock issued in exchange		58,300		
Xperi Common Stock closing share price on June 1, 2020	$	14.00		
			$	816,201
Fair value of replaced TiVo equity awards relating to pre-acquisition vesting of the equity award holders' requisite service periods				12,133
Total merger consideration			$	828,334

Assumed TiVo Equity Awards

In connection with the Mergers, the Company assumed unvested TiVo equity incentive awards with a fair value of $34.1 million, of which $12.1 million related to pre-acquisition services and was included in the purchase price, and $22.0 million related to post-acquisition services. The Company valued the restricted stock units at the Company's closing stock price and stock options using a Black-Scholes pricing model as of the date of acquisition. The fair value relating to post-acquisition services was expected to be amortized as stock-based compensation expense over an estimated weighted average remaining service period of 2.5 years after the Mergers.

Purchase Price Allocation

Based on an evaluation of the provisions of ASC 805, "Business Combinations," Xperi was determined to be the accounting acquirer in the Mergers. The Company has applied the acquisition method of accounting that requires, among other things, that identifiable assets acquired and liabilities assumed generally be recognized on the balance sheet at fair value as of the acquisition date. In determining the fair value, the Company utilized various forms of the income, cost and market approaches depending on the asset or liability being fair valued. The estimation of fair value required significant judgment related to future net cash flows (including revenue, operating expenses, and working capital), discount rates reflecting the risk inherent in each cash flow stream, competitive trends, market comparables and other factors. Inputs were generally determined by taking into account historical data (supplemented by current and anticipated market conditions) and growth rates.

The initial allocation of the purchase price was based on preliminary valuations and assumptions. During the fourth quarter of 2020, the Company recorded certain measurement period adjustments shown below.

The table below presents the estimated fair value that was allocated to TiVo's assets and liabilities based upon fair values as determined by the Company ($ in thousands):

	Estimated Useful Life (years)		Preliminary Fair Value (1)	Measurement Period Adjustments (2)	Adjusted Fair Value
Cash and cash equivalents			$ 117,424	$ —	$ 117,424
Accounts receivable			105,778		105,778
Unbilled contracts receivable			69,058		69,058
Other current assets			21,690	233	21,923
Long-term unbilled contracts receivable			129		129
Property and equipment			41,307		41,307
Operating lease right-of-use assets			71,444		71,444
Identifiable intangible assets:					
Patents	10	457,400			
Customer contracts and related relationships	4-9	358,200			
Developed technology	5	34,800			
Content database	9	6,200			
Trademarks and tradenames	N/A	21,400			
Total identifiable intangible assets			878,000		878,000
Goodwill			461,129	116	461,245
Other long-term assets			43,700	(141)	43,559
Accounts payable			(13,258)		(13,258)
Accrued legal fees			(5,619)		(5,619)
Accrued liabilities			(79,071)	(530)	(79,601)
Current portion of deferred revenue			(29,291)		(29,291)
Current portion of long-term debt			(734,609)		(734,609)
Deferred revenue, less current portion			(24,319)		(24,319)
Long-term deferred tax liabilities			(27,949)	421	(27,528)
Long-term debt			(48)		(48)
Noncurrent operating lease liabilities			(59,291)		(59,291)
Other long-term liabilities			(7,870)	(99)	(7,969)
Total purchase price			$ 828,334	$ —	$ 828,334

(1) As previously reported in the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2020.

(2) All adjustments were recorded in the fourth quarter of 2020. These measurement period adjustments primarily related to current indirect taxes payable, current and non-current income taxes receivable and payable, and deferred taxes as additional information was received and tax returns were finalized. All measurement period adjustments were offset against goodwill.

The above allocation of the purchase price is provisional and is still subject to change within the measurement period, including potential adjustments to current indirect taxes payable as additional information is received. The final allocation of the purchase price is expected to be completed as soon as practicable, but no later than one year from the date of the Mergers.

The following is a description of the methods used to determine the fair values of significant assets and liabilities.

Identifiable Intangible Assets

Identifiable intangible assets primarily consist of patents, developed technology, customer relationships, trademarks and tradenames, and content database. In determining the fair value, the Company utilized various forms of the income, cost and market approaches depending on the asset or liability being fair valued. The estimation of fair value required significant judgment related to cash flow forecasts, discount rates reflecting the risk inherent in each cash flow stream, competitive trends, market comparables and other factors. Inputs were generally determined using historical data supplemented by current and anticipated market conditions, and growth rates. Customer contracts and relationships relating to the IP business segment were valued using a "with and without" method. Significant assumptions used in this discounted cash flow analysis are the revenue growth rate, cost of sales, and the discount rate. Patents and other customer contracts and relationships relating to the Product business segment were valued using an excess earnings method. Significant assumptions used in the discounted cash flow analysis for (i) other customer contracts and relationships were the revenue growth rate, EBITDA margins, and the discount rate and (ii) patents were the revenue growth rate, EBITDA margins, and the discount rate. Trademark and tradename,

developed technology, and content database intangible assets were valued using a relief-from-royalty method. The significant assumptions used in the discounted cash flow analysis for (i) trademarks and tradenames were the royalty rates, revenue growth rates, and discount rate, and (ii) developed technology and content database were the royalty rates.

Long-term Debt

On the Merger date, TiVo had outstanding debt under the 2019 Term Loan Facility Agreement ("TiVo 2019 Term Loan"), pursuant to which TiVo was required to pay a 3.0% prepayment premium if the loan was prepaid on or prior to November 22, 2020. Under the 2019 Term Loan Facility Agreement, the Mergers triggered certain change of control conditions that constitute an event of default, thus requiring the debt to be paid immediately following the consummation of the Mergers. In connection with the consummation of the Mergers, the Company, on June 1, 2020, paid the full amount of the outstanding loan balance, including the 3.0% prepayment penalty. See "Note 11 – Debt" for additional information.

Fair value of the TiVo 2019 Term Loan was measured based on the par value of principal outstanding plus prepayment premium, which is equal to the amount that was paid by Xperi immediately following the consummation of the Mergers. The fair value of the TiVo 2019 Term Loan would be classified in Level 2 of the fair value hierarchy.

Goodwill

The excess of the consideration transferred over the fair value of assets acquired and liabilities assumed was recognized as goodwill. The goodwill is generated from operational synergies and cost savings the Company expects to achieve from the combined operations, as well as the expected benefits from future technologies that do not meet the definition of an identifiable intangible asset and TiVo's knowledgeable and experienced workforce. See Note 10 for the allocation of goodwill to the reportable segments. Of the total goodwill acquired, $14.1 million is expected to be deductible for tax purposes; the remainder of the goodwill is not expected to be deductible for tax purposes.

TiVo Results of Operations

TiVo's results of operations and cash flows have been included in the Company's consolidated financial statements for periods subsequent to June 1, 2020, and TiVo's assets and liabilities were recorded at their estimated fair values in the Company's Consolidated Balance Sheets as of June 1, 2020. For the year ended December 31, 2020, TiVo contributed $593.6 million of revenue and $263.8 million of operating income, respectively, to the operating results of the Company.

Transaction and Severance Costs

In connection with the Mergers, the Company incurred, during the year ended December 31, 2020, significant one-time expenses such as transaction related costs (e.g. bankers fees, legal fees, consultant fees, etc.), lease impairment charges due to facilities consolidation, severance and retention costs (including stock-based compensation expense resulting from the contractually-required acceleration of equity instruments for departing executives). Total transaction related costs and lease impairment charges were $29.4 million and $2.4 million, respectively, in 2020. In addition, post-merger severance and retention costs (including related stock-based compensation expense) amounted to $14.3 million in 2020. The Company may incur additional expenses for integration, severance and retention, and the impairment of right-of-use assets due to facilities consolidation in future periods.

Supplemental Pro Forma Information

The following unaudited pro forma financial information assumes the companies were combined as of January 1, 2019. The unaudited pro forma financial information as presented below is for informational purposes only and is based on estimates and assumptions that have been made solely for purposes of developing such pro forma information. This is not necessarily indicative of the results of operations that would have been achieved if the Mergers had taken place on January 1, 2019, nor is it necessarily indicative of future results. Consequently, actual results could differ materially from the unaudited pro forma financial information presented below. The following table presents the pro forma operating results as if TiVo had been included in the Company's Consolidated Statements of Operations as of January 1, 2019 (unaudited, in thousands):

	Years Ended December 31,	
	2020	2019
Revenue	$ 1,142,603	$ 941,005
Net income (loss) attributable to Xperi Holding Corporation	$ 9,775	$ (562,153)

The unaudited supplemental pro forma information above includes the estimated impact of purchase accounting and other material, nonrecurring adjustments directly attributable to the Mergers. These pro forma adjustments primarily include the following (in thousands):

	Years Ended December 31,	
	2020	2019
Estimated increase (decrease) to earnings due to revenue adjustments resulting from purchase accounting	$ (4,823)	$ (7,191)
Estimated increase (decrease) to earnings to adjust for transaction and other related costs, including facilities impairment charges, incurred in connection with the Mergers	$ 34,569	$ (24,651)
Estimated increase (decrease) to earnings to adjust for severance and retention costs, including related stock-based compensation expense, incurred in connection with the Mergers	$ 15,865	$ (16,511)
Estimated increase (decrease) to earnings to reflect payoff of historical debt and issuance of new debt financing in connection with the Mergers	$ 23,121	$ (18,098)
Estimated decrease to earnings due to pro forma adjustments for income taxes (1)(2)	$ (13,605)	$ (21,519)

(1) For the year ended December 31, 2020, the pro forma tax adjustments primarily reflect the assumption that the combined company placed a valuation allowance on its federal and state deferred tax assets prior to 2020 and the applicability of Base Erosion and Anti-Abuse Tax (“BEAT”) to Xperi tax expense for the period prior to the Mergers.

(2) For the year ended December 31, 2019, the pro forma tax adjustments primarily reflect the assumption that the combined company placed a valuation allowance on its federal and state deferred tax assets prior to 2019 and the applicability of BEAT to Xperi’s tax expense.

The unaudited supplemental pro forma information above does not include any cost saving synergies from operating efficiencies.

NOTE 10 – GOODWILL AND IDENTIFIED INTANGIBLE ASSETS

The changes to the carrying value of goodwill from January 1, 2019 through December 31, 2020 are reflected below (in thousands):

December 31, 2018	$ 385,784
December 31, 2019	$ 385,784
Goodwill acquired through the Mergers (1)	461,129
Purchase price adjustment related to the Mergers (2)	116
December 31, 2020 (3)	$ 847,029

(1) In connection with the TiVo Merger, the Company recorded $461.1 million of goodwill, representing the preliminary fair value as of the effective date of the Mergers. See “Note 9 – Business Combination” for additional details.
(2) Representing measurement period adjustments primarily related to current indirect taxes payable, current and non-current income taxes receivable and payable, and deferred taxes as additional information was received and tax returns were finalized. See “Note 9 – Business Combination” for additional details.
(3)

Of this amount, approximately $523.8 million is allocated to the Company's Product reporting segment and approximately $323.2 million is allocated to its IP Licensing reporting segment.

Goodwill at each reporting unit is evaluated for potential impairment annually, as of the beginning of the fourth quarter, and whenever events or changes in circumstances indicate the carrying amount of goodwill may not be recoverable. The process of evaluating goodwill for potential impairment is subjective and requires significant estimates, assumptions and judgments particularly related to the identification of reporting units, the assignment of assets and liabilities to reporting units and estimating the fair value of each reporting unit.

During the first quarter of 2020, the COVID-19 pandemic rapidly spread globally and has created unprecedented disruptions in economic activity and financial markets. Due to resulting changes in macroeconomic conditions, industry outlook, and a meaningful decline in the Company's share price, indicators of potential goodwill impairment were identified. The Company proceeded with a quantitative interim goodwill impairment test as of March 31, 2020. Based on the quantitative assessment, the Company concluded that the fair value of the reporting units exceeded the carrying amount for both Product Licensing and Semiconductor and IP Licensing. As a result, no goodwill impairment charges were recognized in the three months ended March 31, 2020.

During the fourth quarter of 2020, the COVID-19 pandemic continued to have a significant and negative impact on business and economic activities in the U.S. and around the world. The resulting global economic downturn had negatively impacted, and was expected to continue to negatively impact, the Company's consolidated financial results for the remainder of 2020 and into 2021. Due to continued reduction in demand in certain markets and industries, including the automotive market, as well as declines in the Company's share price, management concluded there were indicators of potential goodwill impairment. The Company proceeded with a quantitative annual goodwill impairment test using the financial information as of September 30, 2020. Based on the quantitative assessment, the Company concluded that the fair value of the reporting units exceeded the carrying amount for both the Product and IP Licensing reporting units. As a result, no goodwill impairment charges were recognized in the three months ended December 31, 2020. In addition, there have been no significant events or circumstances affecting the valuation of goodwill subsequent to the impairment testing performed in the fourth quarter of the year ended December 31, 2020.

When performing the quantitative goodwill impairment test, the Company first determines the fair value of a reporting unit using weighted results derived from an income approach and a market approach. The fair value using an income approach is estimated through the discounted cash flow method based on assumptions about future conditions such as revenue growth rates, operating expenses, EBITDA, discount rates, and other assumptions. Market approaches used by management include the market comparable method, which estimates the fair value based on revenue multiples from comparable companies in similar lines of business, and the market transaction method, which estimates the fair value of the reporting unit by utilizing comparable transactions and transaction multiples.
Identified intangible assets consisted of the following (in thousands):

		December 31, 2020			**December 31, 2019**		
	Average Life (Years)	**Gross Assets**	**Accumulated Amortization**	**Net**	**Gross Assets**	**Accumulated Amortization**	**Net**
Finite-lived intangible assets							
Acquired patents / core technology (1)	3-15	$ 659,085	$ (167,916)	$ 491,169	$ 151,184	$ (135,952)	$ 15,232
Existing technology / content database (2) (3)	5-10	248,110	(169,326)	78,784	206,878	(130,890)	75,988
Customer contracts and related relationships (4)	3-9	650,171	(256,199)	393,972	291,769	(174,741)	117,028
Trademarks/trade name	4-10	40,083	(21,029)	19,054	40,083	(16,056)	24,027
Non-competition agreements	1	2,231	(2,231)	—	2,231	(2,231)	—
Total finite-lived intangible assets		1,599,680	(616,701)	982,979	692,145	(459,870)	232,275
Indefinite-lived intangible assets							
TiVo Tradename/trademarks (5)	N/A	21,400	—	21,400	—	—	—
Total intangible assets		$ 1,621,080	$ (616,701)	$ 1,004,379	$ 692,145	$ (459,870)	$ 232,275

(1) In June 2020, $457.4 million of patents was acquired through the Mergers. See "Note 9 – Business Combination."
(2) In June 2020, $34.8 million of existing (developed) technology was acquired through the Mergers. See "Note 9 – Business Combination."
(3) In June 2020, $6.2 million of content database was acquired through the Mergers. See "Note 9 – Business Combination."
(4) In June 2020, $358.2 million of customer contracts and related relationships was acquired through the Mergers. See "Note 9 – Business Combination."

(5) In June 2020, $21.4 million of TiVo tradename/trademarks was acquired through the Mergers. See “Note 9 – Business Combination.”

As of December 31, 2020, the estimated future amortization expense of total finite-lived intangible assets was as follows (in thousands):

2021	$	202,453
2022		154,014
2023		143,134
2024		104,330
2025		79,862
Thereafter		299,186
	$	982,979

NOTE 11 – DEBT

The outstanding amounts of debt were as follows (in thousands):

		December 31, 2020		December 31, 2019
2020 Term B Loan Facility	$	873,750	$	—
2021 Convertible Notes		48		—
2018 Amended Term B Loan		—		344,000
Unamortized debt discount and issuance costs		(34,448)		(9,321)
		839,350		334,679
Less: current portion, net of debt discount and issuance costs		(43,689)		—
Total long-term debt, net of current portion	$	795,661	$	334,679

2020 Term B Loan Facility

On June 1, 2020, in connection with the consummation of the Mergers with TiVo, the Company entered into a Credit Agreement (the “2020 Credit Agreement”) by and among the Company, the lenders party thereto and Bank of America, N.A., as administrative agent and collateral agent. The 2020 Credit Agreement provides for a five-year senior secured term loan B facility in an aggregate principal amount of $1,050 million (the “2020 Term B Loan Facility”). The interest rate applicable to loans outstanding under the 2020 Term B Loan Facility is equal to, at the Company’s option, either (i) a base rate plus a margin of 3.00% per annum or (ii) LIBOR plus a margin of 4.00% per annum. Commencing on September 30, 2020, the 2020 Term B Loan Facility will amortize in equal quarterly installments in aggregate quarterly amounts equal to (i) with respect to repayments occurring on or prior to June 1, 2023, 1.25% of the original principal amount of the 2020 Term B Loan Facility and (ii) with respect to repayments occurring after June 1, 2023 and prior to June 1, 2025, 1.875% of the original principal amount of the 2020 Term B Loan Facility, with the balance payable on the maturity date of the 2020 Term B Loan Facility (in each case subject to adjustment for prepayments). The 2020 Term B Loan Facility will mature on June 1, 2025. Upon the closing of the 2020 Credit Agreement, the Company borrowed $1,050 million under the 2020 Term B Loan Facility. Net proceeds were used on June 1, 2020, together with cash and cash equivalents, to refinance the existing indebtedness of the combined Company (the “Debt Financing”), including paydown of the TiVo 2019 Term Loan of $734.6 million. See “Note 9 – Business Combination” for additional information relating to the Mergers. Additionally, debt discount and issuance costs of approximately $39.7 million were incurred and capitalized in connection with the 2020 Term B Loan Facility in June 2020.

The Company commenced repaying quarterly installments under the 2020 Term B Loan Facility in the third quarter of 2020, and also elected to make a voluntary principal payment of $150.0 million on December 31, 2020. As outlined in the 2020 Credit Agreement, additional cash payments must be made on an annual basis beginning March 31, 2022 based on certain leverage ratios and excess cash flow generated for the immediately preceding fiscal year. The voluntary principal payment made on December 31, 2020 may be applied against required additional paydowns, if any, beginning March 31, 2022.

The obligations under the 2020 Credit Agreement are guaranteed by Xperi, TiVo and certain other of the Company’s wholly-owned material domestic subsidiaries (collectively, the “Guarantors”) pursuant to the Guaranty, dated as of June 1, 2020 (the “Guaranty”), among Xperi, TiVo, the other Guarantors party thereto and Bank of America, N.A., as administrative agent. The

obligations under the 2020 Credit Agreement are secured by a lien on substantially all of the assets of the Company and the Guarantors pursuant to the Security Agreement, dated as of June 1, 2020 (the "Security Agreement"), among the Company, Xperi, TiVo, the other pledgors party thereto and Bank of America, N.A., as collateral agent.

The 2020 Credit Agreement contains customary events of default, upon the occurrence of which, after any applicable grace period, the lenders will have the ability to accelerate all outstanding loans thereunder. The 2020 Credit Agreement also contains customary representations and warranties and affirmative and negative covenants that, among other things, restrict the ability of the Company and its subsidiaries to create or incur certain liens, incur or guarantee additional indebtedness, merge or consolidate with other companies, transfer or sell assets and make restricted payments. These covenants are subject to a number of limitations and exceptions set forth in the Credit Agreement. The Company was in compliance with all requirements as of December 31, 2020.

2018 Amended Term B Loan

On December 1, 2016, in connection with the consummation of the acquisition of DTS, the Company entered into a Credit Agreement (the "Credit Agreement") by and among the Company, Royal Bank of Canada, as administrative agent and collateral agent, and the lenders party thereto. The Credit Agreement provided for a $600.0 million seven-year term B loan facility (the "Term B Loan Facility") which was scheduled to mature on November 30, 2023. Upon the closing of the Credit Agreement, the Company borrowed $600.0 million under the Term B Loan facility. Net proceeds were used on December 1, 2016, together with cash and cash equivalents, to finance the acquisition of DTS.

On January 23, 2018, the Company and the loan parties entered into an amendment to the Credit Agreement (the "Amendment"). In connection with the Amendment, the Company made a voluntary prepayment of $100.0 million of the term loan outstanding under the Credit Agreement using cash on hand. The Amendment provided for, among other things, (i) a replacement of the outstanding initial term loan with the new tranche term B-1 loan (the "2018 Amended Term B Loan") in a principal amount of $494.0 million, (ii) a reduction of the interest rate margin applicable to such loan to (x) in the case of Eurodollar loans, 2.50% per annum and (y) in the case of base rate loans, 1.50% per annum, (iii) a prepayment premium of 1.00% in connection with any repricing transaction with respect to the 2018 Amended Term B Loan within six months of the closing date of the Amendment, and (iv) certain amendments to provide the Company with additional flexibility under the covenant governing restricted payments. Using cash on hand, the Company made three voluntary prepayments totaling $150.0 million during 2019. On June 1, 2020, the entire remaining balance of $344.0 million was paid off by using the proceeds from the 2020 Term B Loan Facility as part of the TiVo Merger transaction. As a result of the refinancing transaction, the Company recorded a loss on early extinguishment of debt of $8.3 million, which consisted of unamortized debt discount and issuance costs, in its Consolidated Statements of Operations for the year ended December 31, 2020.

2019 Term Loan Facility

In connection with the Mergers, the Company paid off all outstanding balance under the TiVo 2019 Term Loan. The 2019 Term Loan Facility Agreement was entered into on November 22, 2019 between TiVo, as borrower, and the lenders party thereto and HPS Investment Partners, LLC as administrative agent and collateral agent. Under the 2019 Term Loan, TiVo borrowed $715.0 million, which matures on November 22, 2024.

Under the 2019 Term Loan Facility Agreement, TiVo was required to pay a 3.0% prepayment premium if the loan was prepaid on or prior to November 22, 2020. Further under the same Loan Facility Agreement, the Mergers triggered certain change of control conditions that constitute an event of default, thus requiring the debt to be repaid immediately following the consummation of the Mergers. Using the proceeds from the aforementioned 2020 Term B Loan Facility, the Company, on June 1, 2020, made a full repayment of the 2019 Term Loan along with the prepayment penalty for a total payoff amount of $734.6 million.

2021 Convertible Notes

Upon consummation of the TiVo Merger on June 1, 2020, the Company assumed $48.0 thousand of Convertible Senior Notes that were issued by TiVo Solutions Inc. ("TiVo Solutions") in September 2014 and mature October 1, 2021 (the "2021 Convertible Notes"). The 2021 Convertible Notes bear interest at an annual rate of 2.0%, payable semi-annually in arrears on April 1 and October 1 of each year.

Interest Expense and Expected Principal Payments
At December 31, 2020, $873.8 million was outstanding with an interest rate, including the amortization of debt discount and issuance costs, of 5.1%. Interest is payable monthly. There were also $34.4 million of unamortized debt discount and issuance costs recorded as a reduction of the long-term portion of the debt. At December 31, 2019, $344.0 million was outstanding with unamortized debt discount and issuance costs amounting to $9.3 million. Interest expense was $37.9 million, $23.4 million and $25.7 million for the years ended December 31, 2020, 2019 and 2018, respectively. Amortized debt discount and issuance costs, which were included in interest expense, amounted to $6.3 million, $2.5 million and $2.5 million for the years ended December 31, 2020, 2019 and 2018, respectively.

As of December 31, 2020, future minimum principal payments for long-term debt, including the current portion, are summarized as follows (in thousands):

2021	$	52,548
2022		52,500
2023		72,188
2024		78,750
2025		617,812
Total	$	873,798

NOTE 12 – NET INCOME (LOSS) PER SHARE

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

	Years Ended December 31,		
	2020	2019	2018
Denominator:			
Weighted average common shares outstanding	82,840	49,120	48,823
Unvested common shares subject to repurchase	—	—	-
Total common shares-basic	82,840	49,120	48,823
Effect of dilutive securities:			
Options	1	—	—
Restricted stock awards and units	1,015	—	—
Total common shares-diluted	83,856	49,120	48,823

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

For the year ended December 31, 2020, 2.1 million shares subject to stock options and restricted stock awards and units were excluded from the computation of diluted net income per share as they were anti-dilutive.

For each of the years ended December 31, 2019 and 2018, there was no difference in the weighted average number of common shares used for the calculation of basic and diluted loss per share as the effect of all potentially dilutive shares outstanding was anti-dilutive. A total of 1.3 million and 2.9 million shares subject to stock options and restricted stock awards and units were excluded for the years ended December 31, 2019 and 2018, respectively, from the computation of diluted net loss per share because including them would have been anti-dilutive.

NOTE 13 – SHAREHOLDERS' EQUITY

As more fully described in Note 9, Xperi and TiVo completed the Mergers on June 1, 2020 to form Xperi Holding Corporation. Upon completion of the Mergers, each share of common stock of Xperi was converted into the right to receive one fully paid and non-assessable share of Company Common Stock. Further upon completion of the Mergers, each share of TiVo Common Stock was converted into the right to receive 0.455 fully paid and non-assessable shares of the Company Common Stock (the "Exchange Ratio"), in addition to cash in lieu of any fractional shares of the Company Common Stock. Following the Mergers, Xperi Common Stock and TiVo Common Stock were delisted from Nasdaq. Since June 2, 2020, the shares of Company Common Stock have been listed for trading on Nasdaq under ticker symbol "XPER."

As provided in the Merger Agreement, at the effective time of the Mergers, (i) all options and restricted stock unit awards relating to shares of Xperi Common Stock outstanding immediately prior to the effective time of the Mergers were generally automatically converted into options and restricted stock unit awards respectively, relating to shares of the Company Common Stock on a one-for-one basis and otherwise generally on the same terms and conditions (including vesting exercisability and/or settlement requirements) as applied to such options and awards under the applicable plans and award agreements immediately prior to the effective time of the Mergers, and (ii) all options and restricted stock unit awards relating to shares of TiVo Common Stock that were outstanding immediately prior to the effective time of the Mergers were generally automatically converted into options and restricted stock unit awards, respectively, relating to shares of the Company Common Stock after giving effect to appropriate adjustments to reflect the Mergers (including the Exchange Ratio) and otherwise generally on the same terms and conditions (including vesting exercisability and/or settlement requirements) as applied to such options and awards under the applicable plans and award agreements immediately prior to the effective time of the Mergers.

Equity Incentive Plans

Prior to the Merger Date, the Company had implemented and granted equity awards under the Xperi Corporation Seventh Amended and Restated 2003 Equity Incentive Plan. As of the effective date of the Mergers, no future grants will be made under the plan.

The 2020 EIP

In connection with the Mergers and immediately prior to June 1, 2020, the Company adopted the Xperi Holding Corporation 2020 Equity Incentive Plan (the "2020 EIP").

Under the 2020 EIP, the Company may grant equity-based awards to employees, non-employee directors, and consultants for services rendered to the Company (or any parent or subsidiary) in the form of stock options, stock awards, restricted stock awards, restricted stock units, stock appreciation rights, dividend equivalents and performance awards (or any combination thereof). A total of 8,000,000 shares have been reserved for issuance under the 2020 EIP provided that each share issued pursuant to "full value" awards (i.e., stock awards, restricted stock awards, restricted stock units, performance awards and dividend equivalents) are counted against shares available for issuance under the 2020 EIP on a 1.5 to 1 ratio.

The 2020 EIP provides for option grants designed as either incentive stock options or nonstatutory options. Options generally are granted with an exercise price not less than the value of the common stock on the grant date and have a term of ten years from the date of grant and vest over a four-year period. The vesting criteria for restricted stock awards and restricted stock units is generally the passage of time or meeting certain performance-based objectives, and continued employment through the vesting period generally over four years for time-based awards. As of December 31, 2020, there were approximately 3.1 million shares reserved for future grant under the 2020 EIP.

Assumed Plans

On June 1, 2020, the Company assumed all then-outstanding stock options, awards, and shares available and reserved for issuance under all legacy Equity Incentive Plans of TiVo (collectively, the "Assumed Plans"). Stock options assumed from the Assumed Plans generally have vesting periods of four years and a contractual term of seven years. Awards of restricted stock and restricted stock units assumed from the Assumed Plans are generally subject to a four year vesting period. The number of shares subject to stock options and restricted stock unit awards outstanding under these plans are included in the tables below. Shares reserved under the Assumed Plans will be available for future grants. As of December 31, 2020, there were 7.6 million shares reserved for future grants under the Assumed Plan.

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

	Options Outstanding			
	Number of Shares Subject to Options	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value
Balance at December 31, 2017	1,172	$ 24.06		
Options granted	—	$ —		
Options exercised	(427)	$ 18.75		
Options canceled / forfeited / expired	(67)	$ 34.43		
Balance at December 31, 2018	678	$ 26.39		
Options granted	—	$ —		
Options exercised	(42)	$ 16.66		
Options canceled / forfeited / expired	(31)	$ 33.61		
Balance at December 31, 2019	605	$ 26.68		
Options granted	—	$ —		
Options assumed	175	$ 50.96		
Options exercised	(7)	$ 13.47		
Options canceled / forfeited / expired	(136)	$ 44.59		
Balance at December 31, 2020	637	$ 29.59	2.67	$ 458
Vested and expected to vest at December 31, 2020	636		2.66	$ 458
Exercisable at December 31, 2020	620		2.56	$ 458

The following table summarizes information about stock options outstanding and exercisable under all of the Company's plans at December 31, 2020:

	Options Outstanding			Options Exercisable	
Range of Exercise Prices per Share	Number Outstanding (in thousands)	Weighted Average Remaining Contractual Life (in years)	Weighted Average Exercise Price per Share	Number Exercisable (in thousands)	Weighted Average Exercise Price per Share
$12.52 - $19.24	113	2.63	$ 18.06	113	$ 18.06
$19.34 - $19.73	79	2.56	$ 19.53	79	$ 19.53
$20.21 - $21.30	82	2.84	$ 20.68	82	$ 20.67
$22.19 - $22.24	15	3.30	$ 22.19	15	$ 22.19
$22.45 - $22.45	70	6.79	$ 22.45	53	$ 22.45
$22.52 - $38.65	96	3.83	$ 32.48	96	$ 32.48
$43.54 - $43.63	6	0.57	$ 43.56	6	$ 43.56
$43.77 - $43.77	108	0.13	$ 43.77	108	$ 43.77
$45.90 - $54.60	45	0.73	$ 51.35	45	$ 51.35
$54.69 - $54.69	23	1.16	$ 54.69	23	$ 54.69
$12.52 - $54.69	637	2.67	$ 29.59	620	$ 29.80

Restricted Stock Awards and Units

Information with respect to outstanding restricted stock awards and units as of December 31, 2020 is as follows (in thousands, except per share amounts):

	Restricted Stock and Restricted Stock Units			
	Number of Shares Subject to Time-based Vesting	Number of Shares Subject to Performance-based Vesting	Total Number of Shares	Weighted Average Grant Date Fair Value Per Share
Balance at December 31, 2017	2,014	1,119	3,133	$ 33.35
Awards and units granted	1,087	44	1,131	$ 21.85
Awards and units vested / earned	(695)	(176)	(871)	$ 34.84
Awards and units canceled / forfeited	(257)	(230)	(487)	$ 29.35
Balance at December 31, 2018	2,149	757	2,906	$ 29.10
Awards and units granted	1,266	4	1,270	$ 22.79
Awards and units vested / earned	(865)	(118)	(983)	$ 30.62
Awards and units canceled / forfeited	(179)	(89)	(268)	$ 27.53
Balance at December 31, 2019	2,371	554	2,925	$ 25.99
Awards and units granted	3,331	994	4,325	$ 14.64
Awards and units assumed	2,185	253	2,438	$ 13.99
Awards converted	11	(11)	—	$ 22.45
Awards and units vested / earned	(1,676)	(487)	(2,163)	$ 21.12
Awards and units canceled / forfeited	(560)	(242)	(802)	$ 19.96
Balance at December 31, 2020	5,662	1,061	6,723	$ 16.63

Performance Awards and Units

Performance awards and units may be granted to employees or consultants based upon, among other things, the contributions, responsibilities and other compensation of the particular employee or consultant. The value and the vesting of such performance awards and units are generally linked to one or more performance goals or certain market conditions determined by the Company, in each case on a specified date or dates or over any period or periods determined by the Company, and may range from zero to 200 percent of the grant. For performance awards subject to a market vesting condition, the fair value per award is fixed at the grant date and the amount of compensation expense is not adjusted during the performance period regardless of changes in the level of achievement of the market condition.

Employee Stock Purchase Plans

Prior to the Mergers, the Company had implemented the Xperi Corporation 2003 Employee Stock Purchase Plan and the International Employee Stock Purchase Plan, both of which were terminated immediately prior to the effective time of the Mergers.

In connection with the Mergers and immediately prior to June 1, 2020, the Company adopted the Xperi Holding Corporation 2020 Employee Stock Purchase Plan (the “2020 ESPP”). The 2020 ESPP is implemented through consecutive overlapping 24-month offering periods, each of which is comprised of four six-month purchase periods. The first offering period commenced on September 1, 2020 and will end on August 31, 2022. Each subsequent offering period under the 2020 ESPP will be twenty-four (24) months long and will commence on each September 1 and March 1 during the term of the plan. Participants may contribute up to 100% of their base earnings and commissions through payroll deductions, and the accumulated deductions will be applied to the purchase of shares on each semi-annual purchase date. The purchase price per share will equal 85% of the fair market value per share on the start date of the offering period or, if lower, 85% of the fair market value per share on the semi-annual purchase date.

An eligible employee’s right to buy the Company’s common stock under the 2020 ESPP may not accrue at a rate in excess of $25,000 of the fair market value of such shares per calendar year for each calendar year of an offering period. If the fair market value per share of the Company’s common stock on any purchase date during an offering period is less than the fair market value per share on the start date of the 24-month offering period, then that offering period will automatically terminate and a new 24-month offering period will begin on the next business day. All participants in the terminated offering will be transferred to the new offering period.

As of December 31, 2020, there were 2.0 million shares reserved for grant under the Company's 2020 ESPP.

Dividends

Stockholders of the Company's common stock are entitled to receive dividends when declared by the Company's Board of Directors. For the years ended December 31, 2020, 2019 and 2018, dividends declared were $0.50, $0.80, and $0.80 per common share, respectively.

The capacity to pay dividends in the future depends on many factors, including the Company's financial condition, results of operations, capital requirements, capital structure, industry practice and other business conditions that the Board of Directors considers relevant.

Stock Repurchase Programs

Following the termination of Xperi's prior stock repurchase program after the closing of the Mergers, on June 12, 2020 the Board of Directors (the "Board") of the Company authorized a new stock repurchase program providing for the repurchase of up to $150.0 million of the Company's Common Stock dependent on market conditions, share prices and other factors. As of December 31, 2020, the Company has repurchased a total of approximately 4.9 million shares of common stock, since inception of the plan, at an average price of $14.25 per share for a total cost of $70.1 million. The shares repurchased are recorded as treasury stock and are accounted for under the cost method. No expiration date has been specified for this plan. As of December 31, 2020, the total remaining amount available for repurchase was $79.9 million. The Company plans to continue to execute authorized repurchases from time to time under the plan.

In connection with the Mergers, all shares repurchased by the Company as of June 1, 2020 and recorded as treasury stock were canceled and retired. The Company accounts for stock repurchases using the cost method and records retirement of treasury stock as a reduction of the cumulative treasury stock paid-in capital balance. Once the cumulative balance is reduced to zero, any remaining difference resulting from the retirement of treasury stock is recorded as a reduction of retained earnings.

The Company issues restricted stock and restricted stock units (collectively, "restricted awards") as part of the equity incentive plans described above. For the majority of restricted awards, shares are withheld to satisfy required withholding taxes at the vesting date. Shares withheld to satisfy required withholding taxes in connection with the vesting of restricted awards are treated as common stock repurchases in the consolidated financial statements because they reduce the number of shares that would have been issued on vesting. However, these withheld shares are not included in common stock repurchases under the Company's authorized share repurchase plan. During the years ended December 31, 2020, 2019 and 2018, the Company withheld 0.7 million, 0.2 million and 0.2 million shares of common stock to satisfy $10.5 million, $4.5 million and $3.4 million of required withholding taxes, respectively.

NOTE 14 – STOCK-BASED COMPENSATION EXPENSE

The effect of recording stock-based compensation expense for the years ended December 31, 2020, 2019 and 2018 is as follows (in thousands):

	Years Ended December 31,		
	2020	**2019**	**2018**
Cost of licensing, services and software revenue, excluding depreciation and amortization of intangible assets	$ 781	$ —	$ —
Research, development and other related costs	13,592	14,643	13,168
Selling, general and administrative	24,762	16,911	17,843
Total stock-based compensation expense	39,135	31,554	31,011
Tax effect on stock-based compensation expense	(2,116)	(5,051)	(4,869)
Net effect on net income (loss)	$ 37,019	$ 26,503	$ 26,142

In connection with the Mergers, the Company assumed unvested TiVo equity awards with a fair value of $34.1 million, of which $22.0 million related to post-acquisition services. For the year ended December 31, 2020, the Company recognized $5.8 million associated with the unvested TiVo equity awards assumed. See "Note 9 – Business Combination" for additional detail.

Stock-based compensation expense categorized by various equity components for the years ended December 31, 2020, 2019 and 2018 is summarized in the table below (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Restricted stock awards and units	$ 36,451	$ 29,031	$ 27,974
Employee stock purchase plan	2,613	2,304	2,599
Employee stock options	71	219	438
Total stock-based compensation expense	$ 39,135	$ 31,554	$ 31,011

The total fair value of restricted stock awards and units vested during the years ended December 31, 2020, 2019 and 2018 was $45.7 million, $30.1 million and $30.4 million, respectively.

The total intrinsic value of options exercised during the years ended December 31, 2020, 2019 and 2018 was $0.1 million, $0.2 million and $1.0 million, respectively. The intrinsic value is calculated as the difference between the market value on the date of exercise and the exercise price of the shares.

As of December 31, 2020, the unrecognized stock-based compensation balance after estimated forfeitures consisted of $0.1 million related to unvested stock options, to be recognized over an estimated weighted average amortization period of 0.8 years, and $73.5 million related to restricted stock awards and units, including performance-based awards and units, to be recognized over an estimated weighted average amortization period of 2.7 years.

As of December 31, 2019, the unrecognized stock-based compensation balance after estimated forfeitures consisted of $0.1 million related to unvested stock options, to be recognized over an estimated weighted average amortization period of 1.5 years, and $40.3 million related to restricted stock awards and units, including performance-based awards and units, to be recognized over an estimated weighted average amortization period of 2.3 years.

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

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

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

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

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

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

There were no stock options granted during the years ended December 31, 2020, 2019 and 2018.

The following assumptions were used to value the ESPP shares:

	Years Ended December 31,		
	2020	2019	2018
Expected life (years)	2.0	2.0	2.0
Risk-free interest rate	0.1 - 1.4%	1.7 - 2.5%	2.2 - 2.7%
Dividend yield	1.4 - 4.0%	3.5 - 5.4%	3.6 - 3.9%
Expected volatility	45.8 - 57.5%	51.7 - 53.4%	39.4 - 41.7%

For the years ended December 31, 2020, 2019 and 2018, an aggregate of 355,000, 386,000 and 306,000 common shares, respectively, were purchased pursuant to the ESPP.

The Company uses a Monte Carlo simulation to determine the grant date fair value of performance stock units subject to market conditions, or market-based PSUs. The following assumptions were used to value the performance stock units subject to market conditions granted in the year ended December 31, 2020:

	Year Ended December 31, 2020
Expected life (years)	3.0
Risk-free interest rate	0.2%
Dividend yield	1.4%
Expected volatility	51.3%

There were no market-based PSUs granted during the years ended December 31, 2019 and 2018.

Modifications

From time to time, the Company enters into consulting agreements with its departing employees. Some of these agreements may include continued vesting of the departing employees' stock awards and an extension of the exercise period from the standard 90 days from employment termination date to the termination of the consulting agreement. There were no modifications in the years ended December 31, 2020, 2019 and 2018, respectively.

NOTE 15 – INCOME TAXES

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

	Years Ended December 31,		
	2020	2019	2018
U.S.	$ 140,428	$ (53,346)	$ 16,684
Foreign	(4,519)	(29,711)	(9,774)
Total income (loss) before taxes from continuing operations	$ 135,909	$ (83,057)	$ 6,910

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

	Years Ended December 31,		
	2020	2019	2018
Current:			
U.S. federal	$ 15,175	$ 68,772	$ 290
Foreign	1,523	(42,147)	22,668
State and local	10,124	94	10
Total current	26,822	26,719	22,968
Deferred:			
U.S. federal	(28,154)	(41,826)	(10,766)
Foreign	(1,132)	(4,145)	(3,191)
State and local	(5,423)	228	(338)
Total deferred	(34,709)	(45,743)	(14,295)
Provision for (benefit from) income taxes	$ (7,887)	$ (19,024)	$ 8,673

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

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

	December 31,	
	2020	2019
Deferred tax assets		
Net operating losses	$ 144,064	$ 10,142
Research tax credits	82,378	13,475
Foreign tax credits	106,795	—
Expenses not currently deductible	44,232	14,276
Basis difference in fixed and intangible assets	7,206	3,593
Deferred revenue	20,828	—
Capitalized research expenses	61,296	23,785
Lease liability	17,995	364
Gross deferred tax assets	484,794	65,635
Valuation allowance	(287,895)	(37,243)
Net deferred tax assets	196,899	28,392
Deferred tax liabilities		
Revenue recognition	(7,733)	(32,466)
Operating leases	(17,535)	(2,665)
Acquired intangible assets, domestic	(185,662)	(17,165)
Acquired intangible assets, foreign	(33)	(2,171)
Other	(3,004)	—
Net deferred tax liabilities	$ (17,068)	$ (26,075)

At December 31, 2020 and 2019, the Company had a valuation allowance of $287.9 million and $37.2 million, respectively, related to federal, state, and foreign deferred tax assets that the Company believes will not be realizable on a more-likely-than-not basis. The $250.7 million increase from the prior year is primarily comprised of a net $281.7 million increase as a result of the Mergers, offset by a net decrease of $31.0 million primarily from the utilization of tax attributes as a result of the Comcast license agreement.

The need for a valuation allowance requires an assessment of both positive and negative evidence when determining whether it is more-likely-than-not that deferred tax assets are recoverable. Such assessment is required on a jurisdiction-by-jurisdiction basis. In making such assessment, significant weight is given to evidence that can be objectively verified. After considering both positive and negative evidence to assess the recoverability of the Company's net deferred tax assets, the Company determined that it was not more-likely-than-not that it would realize its federal, certain state and certain foreign deferred tax assets given the substantial amount of tax attributes that will remain unutilized to offset reversing deferred tax liabilities as of December 31, 2020. The Company intends to continue maintaining a full valuation allowance on its federal deferred tax assets

until there is sufficient evidence to support the reversal of all or some portion of these allowances. However, given the Company's current earnings and anticipated future earnings, the Company believes that there is a reasonable possibility that within the next 12 months, sufficient positive evidence may become available to allow the Company to reach a conclusion that a significant portion of the federal valuation allowance will no longer be needed. Release of the valuation allowance would result in the recognition of certain federal deferred tax assets and a decrease to income tax expense for the period the release is recorded. However, the exact timing and amount of the valuation allowance release are subject to change on the basis of the level of profitability that the Company is able to actually achieve.

As of December 31, 2020, the Company had federal net operating loss carryforwards of approximately $509.2 million and state net operating loss carryforwards of approximately $1,133.1 million (post-apportioned). All of the federal net operating loss carryforwards are carried over from TiVo. The state net operating loss carryforwards are carried over from acquired entities, including TiVo in 2020, DTS in 2016, Ziptronix in 2015, and Siimpel Corporation in 2010. The federal net operating loss carryforwards, if not utilized, will begin to expire on various dates beginning in 2021 and will continue to expire through 2035. The state net operating loss carryforwards, if not utilized, will begin to expire on various dates beginning in 2021 and will continue to expire through 2039.

In addition, the Company has research tax credit carryforwards of approximately $82.9 million for federal purposes, which were carried over from prior years. The federal research tax credit will start to expire in 2021 and will continue to expire through 2040. The Company also has research tax credit carryforwards of approximately $82.2 million for state purposes and $0.6 million for foreign purposes, which do not expire. The Company has $128.1 million of foreign tax credit carryforwards which will begin to expire in 2021 and will continue to expire through 2030. Under the provisions of the Internal Revenue Code, substantial ownership changes may limit the amount of net operating loss and tax credit carryforwards that can be utilized annually in the future to offset taxable income. In addition, for losses generated after December 31, 2017, the Tax Cuts and Jobs Act modified the maximum deduction of net operating loss, eliminated carryback, and provided an indefinite carryforward.

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

	Years Ended December 31,		
	2020	2019	2018
U.S. federal statutory rate	$ 28,541	$ (17,442)	$ 1,451
State, net of federal benefit	(1,530)	281	59
Stock-based compensation expense	2,471	2,807	3,883
Executive compensation limitation	2,132	411	1,538
Research tax credit	(1,576)	(2,038)	248
Foreign withholding tax	9,391	10,328	33,063
Transaction costs	8,216	974	—
Foreign tax rate differential	921	1,907	474
Foreign tax credit	(2,647)	(7,795)	(33,554)
Change in valuation allowance	(47,649)	(8,238)	7,721
U.S. tax reform	(1,845)	(2,970)	(6,333)
Unrecognized tax benefits	3,049	2,994	300
Change in estimates	(1,355)	(1,300)	(10)
Foreign exchange	(7,438)	—	—
Others	1,432	1,057	(167)
Total	$ (7,887)	$ (19,024)	$ 8,673

At December 31, 2020, the Company asserts that it will not permanently reinvest its foreign earnings outside the U.S. The Company anticipates that the cash from its foreign earnings may be used domestically to fund operations, settle a portion of the outstanding debt obligation, or used for other business needs. The accumulated undistributed earnings generated by its foreign subsidiaries was approximately $205.7 million. Substantially all of these earnings will not be taxable upon repatriation to the United States since under the Tax Cuts and Jobs Act they will be treated as previously taxed income from the one-time transition tax, Global Intangible Low-Taxed Income or dividends-received deduction. The withholding taxes related to the distributable cash of the Company's foreign subsidiaries are not expected to be material.

During the fourth quarter of 2019, the Company filed a refund claim for foreign taxes previously withheld from licensees in South Korea based on court rulings in South Korea and other business factors. These previously withheld foreign taxes were claimed as a foreign tax credit in the U.S. As a result of the 2019 refund claim and a planned refund claim for 2020, the

Company recorded $123.0 million and $65.2 million as a noncurrent income tax receivable at December 31, 2020 and 2019, respectively, $62.3 million and $48.2 million as a noncurrent income tax payable at December 31, 2020 and 2019, respectively, and $36.7 million and $17.0 million as a reduction in deferred tax assets at December 31, 2020 and 2019, respectively.

As of December 31, 2020, unrecognized tax benefits approximated $233.2 million, of which $100.4 million would affect the effective tax rate if recognized. As of December 31, 2019, unrecognized tax benefits approximated $87.3 million, of which $82.9 million would affect the effective tax rate if recognized. The Company believes that its unrecognized tax benefits as of December 31, 2020 will decrease by approximately $5.8 million within the next twelve months due to expiring statutes of limitation.

The reconciliation of the Company's unrecognized tax benefits for the years ended December 31, 2020, 2019 and 2018 is as follows (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Total unrecognized tax benefits at January 1	$ 87,294	$ 33,552	$ 33,506
Increases due to the Mergers	103,443	—	—
Increases for tax positions related to the current year	46,978	54,823	586
Increases for tax positions related to prior years	2,541	178	—
Decreases for tax positions related to prior years	(7,100)	(1,259)	(540)
Total unrecognized tax benefits at December 31	$ 233,156	$ 87,294	$ 33,552

It is the Company's policy to classify accrued interest and penalties related to unrecognized tax benefits in the provision for income taxes. For the years ended December 31, 2020, 2019 and 2018, the Company recognized an insignificant amount of interest and penalties related to unrecognized tax benefits. Accrued interest and penalties were $2.5 million and $1.2 million as of December 31, 2020 and 2019, respectively.

At December 31, 2020, the Company's 2016 through 2019 tax years are generally open and subject to potential examination in one or more jurisdictions. Earlier tax years for the Company and its subsidiaries are also open in certain jurisdictions which are currently subject to examination. In addition, in the U.S., any net operating losses or credits that were generated in prior years but not yet fully utilized in a year that is closed under the statute of limitations may also be subject to examination. The Company has submitted a withholding tax refund claim with the South Korean authorities and the final outcome is not anticipated to be settled within the next twelve months.

NOTE 16 – COMMITMENTS AND CONTINGENCIES

Purchase and Other Contractual Obligations

In the ordinary course of business, the Company enters into contractual agreements with third parties that include non-cancelable payment obligations, for which it is liable in future periods. These arrangements primarily include unconditional purchase obligations to service providers. Total future unconditional purchase obligations as of December 31, 2020 were as follows (in thousands):

2021	$ 41,291
2022	25,654
2023	22,621
2024	10,698
2025	8,292
Thereafter	40,861
Total	$ 149,417

Additionally, under certain other contractual arrangements, the Company may be obligated to pay up to $3.5 million, a majority of which is expected to be paid in 2021, if certain milestones are achieved.

On December 31, 2019, TiVo entered into a contract requiring the Company to generate a minimum number of Qualified Referred Subscribers (as defined in the contract) over a 30 month period. In the event that the aggregate number of Qualified Referred Subscribers generated by the Company within the specified time period is less than the minimum guaranteed subscribers, the Company is required to pay an amount equal to the shortfall between the number of Qualified Referred

Subscribers generated by the Company and the required minimum multiplied by a per Qualified Referred Subscribers fee, up to a maximum of $5.0 million. As of December 31, 2020, $2.6 million was accrued in the Consolidated Balance Sheets related to this contract.

Inventory Purchase Commitment

The Company uses contract manufacturers to provide manufacturing services for its products. During the normal course of business, in order to manage manufacturing lead times and help ensure adequate supply, the Company enters into agreements with its contract manufacturers that either allow them to procure inventory based on criteria as defined by the Company or that establish the parameters defining the Company's requirements. A significant portion of the Company's purchase commitments arising from these agreements consist of firm, non-cancelable and unconditional purchase commitments. In certain instances, these agreements allow the Company the option to cancel, reschedule or adjust the Company's requirements based on its business needs prior to firm orders being placed. As of December 31, 2020, the Company had total purchase commitments for inventory of $4.2 million, of which $0.5 million was accrued in the Consolidated Balance Sheets.

Indemnifications

In the normal course of business, the Company provides indemnifications of varying scopes and amounts to certain of its licensees, customers, and business partners against claims made by third parties arising from the use of the Company's products, intellectual property, services or technologies. The Company cannot reasonably estimate the possible range of losses that may be incurred pursuant to its indemnification obligations, if any. Variables affecting any such assessment include, but are not limited to: the nature of the claim asserted; the relative merits of the claim; the financial ability of the party suing the indemnified party to engage in protracted litigation; the number of parties seeking indemnification; the nature and amount of damages claimed by the party suing the indemnified party; and the willingness of such party to engage in settlement negotiations. To date, no such claims have been filed against the Company and no liability has been recorded in the Company's financial statements.

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

Contingencies

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

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

The existing and any future legal actions may harm the Company's business. For example, legal actions could cause an existing licensee or strategic partner to cease making royalty or other payments to the Company, or to challenge the validity and enforceability of patents owned by the Company's subsidiaries or the scope of license agreements with the Company's subsidiaries, or could significantly damage the Company's relationship with such licensee or strategic partner and, as a result, prevent the adoption of the Company's other technologies by such licensee or strategic partner. Litigation could also severely disrupt or shut down the business operations of licensees or strategic partners of the Company's subsidiaries, which in turn would significantly harm ongoing relations with them and cause the Company to lose royalty revenue.

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

NOTE 17 – SEGMENT AND GEOGRAPHIC INFORMATION

In connection with the Mergers, the Company re-evaluated its reportable segments. The Company concluded that it has two reportable segments for financial reporting purposes: (1) Product and (2) Intellectual Property ("IP") Licensing. There are certain corporate overhead costs that are not allocated to these reportable segments because these operating amounts are not considered in evaluating the operating performance of the Company's business segments.

Reportable segments are identified based on the Company's organizational structure and information reviewed by the Company's chief operating decision maker ("CODM") to evaluate performance and allocate resources. The Company's Chief Executive Officer is also the CODM as defined by the authoritative guidance on segment reporting.

The Product segment consists primarily of licensing Company-developed audio, digital radio, imaging, edge-based machine learning and multi-channel video user experience ("UX") solutions. Audio, digital radio, imaging solutions and edge-based machine learning include the delivery of software and/or hardware-based solutions to the Company's consumer electronics ("CE") customers, automotive manufacturers or their supply chain partners. UX products and services revenue is primarily derived from multi-channel video service providers and CE manufacturers, licensing the TiVo service and selling TiVo-enabled devices like the Stream 4K, Personalized Content Discovery, enriched Metadata, viewership data and advertising.

The IP Licensing segment consists primarily of licensing the Company's innovations to leading companies in the media and semiconductor industries. Licensing arrangements include access to one or more of the Company's foundational patent portfolios and may also include access to some of its industry-leading technologies and proven know-how. In media, the Company's licensees include multichannel video programming distributors, OTT video service providers, consumer electronics manufacturers, social media, and other new media companies. In semiconductor, the Company's licensees include memory, sensors, RF component, and foundry companies.

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

The following table sets forth the Company's segment revenue, operating expenses and operating income (loss) for the years ended December 31, 2020, 2019 and 2018 (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Revenue:			
Product segment	$ 376,101	$ 198,124	$ 218,349
IP Licensing segment	515,919	81,943	187,784
Total revenue	892,020	280,067	406,133
Operating expenses:			
Product segment	351,913	186,562	185,370
IP Licensing segment	113,363	44,542	74,002
Unallocated operating expenses (1)	249,117 (2)	117,671	122,781
Total operating expenses	714,393	348,775	382,153
Operating income (loss):			
Product segment	24,188	11,562	32,979
IP Licensing segment	402,556	37,401	113,782
Unallocated operating expenses (1)	(249,117)	(117,671)	(122,781)
Total operating income (loss)	$ 177,627	$ (68,708)	$ 23,980

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

(2) Includes approximately $29.4 million in one-time transaction costs related to the Mergers and $14.3 million in post-merger severance and retention costs.

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

	Years Ended December 31,		
	2020	2019	2018
Amortization and depreciation:			
Product segment	$ 111,129	$ 93,402	$ 93,582
IP Licensing segment	59,881	13,264	21,544
Unallocated	3,734	—	—
Total amortization and depreciation	$ 174,744	$ 106,666	$ 115,126

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

	Years Ended December 31,					
	2020		2019		2018	
U.S.	$ 548,857	62%	$ 74,469	26%	$ 53,245	13%
Japan	114,195	13	85,833	31	88,513	22
Korea	110,782	12	74,790	27	209,245	51
Europe and Middle East	38,830	4	19,638	7	31,864	8
Other	79,356	9	25,337	9	23,266	6
	$ 892,020	100%	$ 280,067	100%	$ 406,133	100%

For the years ended December 31, 2020, 2019 and 2018, one, two, and two customers, respectively, each accounted for 10% or more of total revenue.

As of December 31, 2020, 2019 and 2018, property and equipment, net, by geographic area are presented below (in thousands):

	December 31,		
	2020	2019	2018
U.S.	$ 54,818	$ 28,273	$ 29,123
Europe	4,842	4,391	1,533
Asia and other	3,547	213	381
Total	$ 63,207	$ 32,877	$ 31,037

NOTE 18 – BENEFIT PLAN

The Company maintains a 401(k) retirement savings plan that allows voluntary contributions by all eligible U.S. employees upon their hire date. Eligible employees may elect to contribute up to the maximum amount allowed under Internal Revenue Service regulations. The Company can make discretionary contributions under the 401(k) plan. During the years ended December 31, 2020, 2019 and 2018, the Company contributed approximately $4.2 million, $3.0 million, and $2.9 million, respectively, to the 401(k) plan.

NOTE 19 – SUBSEQUENT EVENTS

Declaration of a Cash Dividend

On February 3, 2021, the Board declared a cash dividend of $0.05 per share of common stock, payable on March 30, 2021, for the stockholders of record at the close of business on March 16, 2021.

Schedule II. Valuation and Qualifying Accounts for the Years Ended December 31, 2020, 2019 and 2018
(in thousands):

	Balance at Beginning of Year	Charged (Credited) to Expenses	Charged (Credited) to Other Accounts	Balance at End of Year
Deferred income tax asset:				
Valuation allowance				
2018	$ 32,032	$ 2,794	$ 7,116	$ 41,942
2019	$ 41,942	$ (4,699)	$ —	$ 37,243
2020	$ 37,243	$ (50,838)	$ 301,490	$ 287,895

EXHIBIT INDEX

Exhibit Number	Exhibit Description
2.1*	Agreement and Plan of Merger and Reorganization, dated December 18, 2019, by and among the Registrant, TiVo Corporation, XRAY Merger Sub Corporation, TWOLF Merger Sub Corporation and XRAY-TWOLF HoldCo Corporation (filed as Exhibit 2.1 to the Registrant's Current Report on Form 8-K, filed December 24, 2019, and incorporated herein by reference)
3.1	Certificate of Incorporation of the Company (filed as Exhibit 3.1 to Xperi Holding's Current Report on Form S-4 filed with the SEC on February 18, 2020, and incorporated herein by reference)
3.2	Amended and Restated Certificate of Incorporation of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020, and incorporated herein by reference)
3.3	Bylaws of the Company (filed as Exhibit 3.3 to Xperi Holding's Current Report on Form S-4 filed with the SEC on February 18, 2020, and incorporated herein by reference)
3.4	Amended and Restated Bylaws of the Company, dated May 29, 2020 (filed as Exhibit 3.2 to the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020, and incorporated herein by reference)
10.1+	Employment and Severance Agreement, dated April 28, 2017, by and between the Registrant and Jon Kirchner (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed August 2, 2017, and incorporated herein by reference)
10.2+	Non-Employee Director Compensation Policy (filed as Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q, filed August 2, 2017, and incorporated herein by reference)
10.3	Supplement to Commitment Letter and Fee Letter, dated January 3, 2020, by and among the Registrant, TiVo Corporation, Bank of America, N.A., Royal Bank of Canada, and Barclays Bank PLC (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed January 7, 2020, and incorporated herein by reference)
10.4	Credit Agreement, dated as of June 1, 2020, among the Company, the lenders party thereto and Bank of America, N.A., as administrative agent and collateral agent (incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020 (File No. 001-39304))
10.5	Guaranty, dated as of June 1, 2020, among Xperi, TiVo, the other subsidiary guarantors party thereto and Bank of America, N.A., as administrative agent (incorporated by reference to Exhibit 10.2 of the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020 (File No. 001-39304))
10.6	Security Agreement, dated as of June 1, 2020, among the Company, the other pledgors party thereto and Bank of America, N.A., as collateral agent (incorporated by reference to Exhibit 10.3 of the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020 (File No. 001-39304))
10.7+	Xperi Holding Corporation 2020 Equity Incentive Plan (incorporated by reference to Exhibit 4.10 of the Company's Registration Statement on Form S-8 filed with the SEC on June 1, 2020 (File No. 333-238846))
10.8+	Xperi Holding Corporation 2020 Employee Stock Purchase Plan (incorporated by reference to Exhibit 4.11 of the Company's Registration Statement on Form S-8 filed with the SEC on June 1, 2020 (File No. 333-238846))
10.9	Form of Indemnification Agreement for Company Directors, Officers, and Key Employees (incorporated by reference to Exhibit 10.4 of the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020 (File No. 001-39304))
10.10+	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement for the Xperi Holding Corporation 2020 Equity Incentive Plan (incorporated by reference to Exhibit 10.12 of the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020 (File No. 001-39304))
10.11+	Form of Stock Option Grant Notice and Stock Option Agreement for the Xperi Holding Corporation 2020 Equity Incentive Plan (incorporated by reference to Exhibit 10.13 of the Company's Current Report on Form 8-K filed with the SEC on June 1, 2020 (File No. 001-39304))
10.12+	TiVo Corporation 2008 Equity Incentive Plan (f/k/a the "Rovi Corporation 2008 Equity Incentive Plan") (incorporated by reference to Annex A to the Definitive Proxy Statement on Schedule 14A of TiVo Corporation, filed March 15, 2019 (File No. 001-37870))
10.13+	TiVo Inc. Amended and Restated 2008 Equity Incentive Award Plan (now named the "TiVo Corporation Titan Equity Incentive Award Plan") (incorporated by reference to Exhibit 4.7 to Registration Statement on Form S-8 of TiVo Corporation, filed September 9, 2016 (File No. 333-213578))
10.14+	Xperi Corporation Seventh Amended and Restated 2003 Equity Incentive Plan and Amendment No. 1 (incorporated by reference to Appendices A and B to Additional Definitive Proxy Soliciting Materials on Schedule 14A of Xperi Corporation, filed April 18, 2018 (File No. 001-37956))

10.15+	DTS, Inc. 2014 New Employee Incentive Plan (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of DTS, Inc., filed August 20, 2014 (File No. 000-50335))
10.16+	Amendment No. 1 to the DTS, Inc. 2014 New Employee Incentive Plan (incorporated by reference to Exhibit 99.3 to Registration Statement on Form S-8 of DTS, Inc., filed August 10, 2015 (File No. 333-206283))
10.17+	Amendment No. 2 to the DTS, Inc. 2014 New Employee Incentive Plan (incorporated by reference to Exhibit 99.3 to Registration Statement on Form S-8 of DTS, Inc., filed November 9, 2015 (File No. 333-207899))
10.18+	DTS, Inc. 2012 Equity Incentive Plan and Amendment No. 1 (incorporated by reference to Appendix A to Definitive Proxy Statement on Schedule 14A of DTS, Inc., filed April 14, 2015 (File No. 000-50335))
10.19+	SRS Labs, Inc. 2006 Stock Incentive Plan, as amended and restated on August 9, 2012 (incorporated by reference to Exhibit 4.4 to Registration Statement on Form S-8 of DTS, Inc., filed August 13, 2012 (File No. 333-183289))
10.20+	DTS, Inc. 2003 Equity Incentive Plan, as amended on May 9, 2005, May 15, 2008, February 19, 2009, February 15, 2010, June 3, 2010 and October 8, 2010 (incorporated by reference to Exhibit 10.1 to Form 10-Q of DTS, Inc., filed November 8, 2010 (File No. 000-50335))
10.21	Form of Severance Agreement, dated September 29, 2020, between the Company and each of Robert Andersen, Geir Skaaden, Paul Davis, Matthew Milne, and Michael Hawkey (incorporated by reference to Exhibit 10.1 to Form 10-Q of Xperi Holding Corporation, filed November 9, 2020)
10.22	Form of Change in Control Severance Agreement, dated as of September 29, 2020, between the Company and each of Robert Andersen, Geir Skaaden, Paul Davis, Matthew Milne, and Michael Hawkey (incorporated by reference to Exhibit 10.2 to Form 10-Q of Xperi Holding Corporation, filed November 9, 2020)
10.23	Amendment to Employment and Severance Agreement between Xperi Corporation and Jon Kirchner dated April 28, 2017, effective as of September 29, 2020 (incorporated by reference to Exhibit 10.3 to Form 10-Q of Xperi Holding Corporation, filed November 9, 2020)
21.1	List of subsidiaries
23.1	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm
24.1	Power of Attorney (see signature page to this Annual Report on Form 10-K)
31.1	Certification of the Chief Executive Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934
31.2	Certification of the Chief Financial Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934
32.1	Certification of the Chief Executive Officer and Chief Financial Officer pursuant to Rule 13a-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
99.1	Stipulation and (Proposed) Order Regarding Mootness Fee Request, Notice, and Dismissal
101.INS	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)

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

Item 16. Form 10-K Summary

None.

SIGNATURES

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

Dated: February 26, 2021

Xperi Holding Corporation

By: /s/ Jon Kirchner

Jon Kirchner
Chief Executive Officer and President

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Jon Kirchner and Robert Andersen, and each of them, with full power of substitution and resubstitution and full power to act without the other, as his true and lawful attorney-in-fact and agent to act in his name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

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

Signature	Title	Date
/s/ Jon Kirchner **Jon Kirchner**	Chief Executive Officer, President and Director (Principal Executive Officer)	February 26, 2021
/s/ Robert J. Andersen **Robert J. Andersen**	Chief Financial Officer (Principal Financial and Accounting Officer)	February 26, 2021
/s/ Dave Habiger **Dave Habiger**	Chairman of the Board of Directors	February 26, 2021
/s/ Darcy Antonellis **Darcy Antonellis**	Director	February 26, 2021
/s/ Laura Durr **Laura Durr**	Director	February 26, 2021
/s/ Daniel Moloney **Daniel Moloney**	Director	February 26, 2021
/s/ Raghavendra Rau **Raghavendra Rau**	Director	February 26, 2021
/s/ Christopher A. Seams **Christopher A. Seams**	Director	February 26, 2021

Exhibit 21.1

SUBSIDIARIES OF THE REGISTRANT

NAME	STATE OR OTHER JURISDICTION OF INCORPORATION
All In Media Pty Ltd.	Australia
DLLNI LIMITED	England and Wales
DTS Licensing Limited	Ireland
DTS, Inc.	Delaware
DTS International Services GmbH	Germany
FotoNation Limited	Ireland
FotoNation SRL	Romania
Guangzhou DTS Digital Theater Systems, Co. Ltd.	China
iBiquity Digital Corporation	Delaware
Invensas Bonding Technologies Inc.	Delaware
Invensas Corporation	Delaware
Phorus, Inc.	Delaware
Tessera Advanced Technologies, Inc.	Delaware
Tessera Intellectual Property Corp.	Delaware
Tessera Technologies, Inc.	Delaware
Tessera, Inc.	Delaware
Perceive Corporation	Delaware
Xcelsis Corporation	Delaware
Xperi Corporation	Delaware
TiVo Corporation	Delaware
Rovi Corporation	Delaware
Rovi Global Services SARL	Luxembourg
Rovi Guides, Inc.	Delaware
Rovi Solutions Corporation	Delaware
TiVo Poland Sp. z o. o.	Poland
TiVo Platform Technologies LLC	Delaware
TiVo Product HoldCo LLC	Delaware
TiVo Solutions Inc.	Delaware
TiVo Tech Private Limited	India
TVSM Publishing, Inc.	Delaware
Veveo, Inc.	Delaware

The names of other subsidiaries are omitted. Such subsidiaries would not, if considered in the aggregate as a single subsidiary, constitute a significant ubsidiary within the meaning of Item 601(b)(21)(ii) of Regulation S-K.

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statement on Form S-8 (No. 333-238846) of Xperi Holding Corporation of our report dated February 26, 2021 relating to the financial statements, financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

San Jose, CA
February 26, 2021

Exhibit 31.1

Certification of the Chief Executive Officer
Pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934

I, Jon Kirchner, certify that:

1. I have reviewed this annual report on Form 10-K of Xperi Holding Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

February 26, 2021

/s/ Jon Kirchner

Jon Kirchner

Chief Executive Officer and President

Exhibit 31.2

Certification of the Chief Financial Officer
Pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934

I, Robert Andersen, certify that:

1. I have reviewed this annual report on Form 10-K of Xperi Holding Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 26, 2021

/s/ Robert Andersen

Robert Andersen
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
RULE 13a-14(b) OF THE SECURITIES EXCHANGE ACT OF 1934
AND 18 U.S.C. SECTION 1350

In connection with the Annual Report of Xperi Holding Corporation, a Delaware corporation (the "Company"), on Form 10-K for the year ended December 31, 2020 as filed with the Securities and Exchange Commission (the "Report"), I, Jon Kirchner, Chief Executive Officer and President, certify, pursuant to Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Jon Kirchner

Jon Kirchner
Chief Executive Officer and President
February 26, 2021

CERTIFICATION PURSUANT TO
RULE 13a-14(b) OF THE SECURITIES EXCHANGE ACT OF 1934
AND 18 U.S.C. SECTION 1350

In connection with the Annual Report of Xperi Holding Corporation, a Delaware corporation (the "Company"), on Form 10-K for the year ended December 31, 2020 as filed with the Securities and Exchange Commission (the "Report"), I, Robert Andersen, Chief Financial Officer of the Company, certify, pursuant to Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Robert Andersen

Robert Andersen
Chief Financial Officer
February 26, 2021

A signed original of this written statement required by Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. § 1350 has been provided to the Registrant and will be retained by the Registrant and furnished to the Securities and Exchange Commission or its staff upon request.

GRANTED
EFiled: Dec 07 2020 12:26PM EST

Transaction ID 66164065
Case No. 2020-0376-JRS

IN THE COURT OF CHANCERY OF THE STATE OF DELAWARE

LOCAL 464A UNITED FOOD AND)
COMMERCIAL WORKERS UNION) PENSION FUND,)
)
Plaintiff,)
)
v.)
) DARCY ANTONELLIS,
DAVID C.) HABIGER, RICHARD S. HILL, JON)
KIRCHNER, V. SUE MOLINA,)
GEORGE A. RIEDEL, and)
CHRISTOPHER A. SEAMS,)
)
Defendants.)

C.A. No. 2020-0376-JRS

STIPULATION AND [PROPOSED] ORDER REGARDING MOOTNESSFEE REQUEST, NOTICE, AND DISMISSAL

WHEREAS, the law firms of Prickett, Jones & Elliott, P.A. and Kessler, Topaz, Meltzer & Check LLP ("Plaintiff's Counsel") filed individual and class claims on behalf of plaintiff Local 464A United Food and Commercial Workers Union Pension Fund ("Plaintiff" or "UFCW") in the above-captioned action (Trans. ID 65638249), seeking relief against the members of the Board of Directors (the "Board" or "Defendants")) of Xperi Corporation

("Xperi" or the "Company") for purportedly breaching their fiduciary duties with respect to the December 18, 2019 Agreement and Plan of Merger and Reorganization (the "Merger Agreement") providing for a combination of Xperi and TiVo Corporation ("TiVo").

WHEREAS, the Complaint alleged three causes of action against the Board:

(a) Count I: breach of fiduciary duty of loyalty for failure to properly consider and disclose a competing proposal (the "Metis Proposal"); (b) Count II: breach of fiduciary duty of loyalty for failure to evaluate the Merger Agreement in light of the COVID-19 pandemic; and (c) Count III: breach of fiduciary duty of loyalty for issuing deliberately misleading and incomplete disclosures with respect to the Metis Proposal and the COVID-19 pandemic;

WHEREAS, on May 20, 2020, Xperi issued an 8-K and substantially identical Form 425 (the "8-K") describing this litigation and containing "Supplemental Disclosures" which it said were intended to moot Plaintiff's claims. TiVo also issued an 8-K and related Form 425 on May 20, 2020 ("TiVo 8-K") containing disclosures addressing certain of Plaintiff's claims. The 8-K mooted the claims relating to the Metis Proposal in Counts I and III and mooted Count II. The 8-K and TiVo 8-K also mooted some of the COVID-19 disclosure claims in Count III, but purportedly did not moot other claims and purportedly raised further disclosure claims;

WHEREAS, on May 22, 2020, Plaintiff filed a Motion for Leave to File a Supplement to Plaintiff's Verified Class Action Complaint (the "Motion for Leave," Trans. ID 65652965) to aver occurrences and events that occurred after Plaintiff filed the Complaint on May 15, 2020;

WHEREAS, on June 1, 2020, the transactions contemplated by the Merger Agreement were implemented and the merged entity became known as Xperi Holding Corporation ("Xperi Holding");

WHEREAS, on June 29, 2020, the Court granted the Motion for Leave (Trans. ID 65730254) and, on July 2, 2020, Plaintiff filed its Supplement to the Verified Class Action Complaint (the "Supplement," Trans. ID 65742228);

WHEREAS, on August 10, 2020, Xperi Holding issued its 10-Q for the second quarter of 2020 (the "10-Q"), issued an earnings release and related 8-K (the "Earnings Release"), presented and filed with the SEC an investor presentation (the "Investor Presentation"), and held an earnings call concerning its second quarter results (the "Earnings Call") (the 10-Q, Earnings Release, Investor Presentation, and Earnings Call are referred to collectively hereafter as the "August 10, 2020 Disclosures");

WHEREAS, the August 10, 2020 Disclosures mooted the remaining claims in the Complaint and Supplement;

WHEREAS, on September 8, 2020, Plaintiff and Defendants agreed that the above-captioned action was moot and the Court thereafter entered a stipulated order of dismissal, retaining jurisdiction to hear Plaintiff's Counsel's request for attorneys' fees and expenses (the "Fee Request") (Trans. ID 65924952);

WHEREAS, Plaintiff claims that its attorneys are entitled to reasonable attorneys' fees and reimbursement of their expenses on the grounds that their litigation efforts conferred benefits on Xperi and its stockholders who became stockholders in Xperi Holding;

WHEREAS, following arms'-length negotiations, Xperi Holding has agreed to pay Plaintiff's Counsel an agreed-upon mootness fee of $300,000 within ten (10) calendar days of the entry of this Order;

WHEREAS Defendants do not concede liability on any of Plaintiff's claims or that Plaintiff and its attorneys are entitled to fees at all;

WHEREAS, Xperi Holding agreed to preemptively resolve the Fee Request due to the cost and litigation risk associated with opposing it;

WHEREAS, Defendants take no position as to the payment of the Fee Request or the amount agreed between Plaintiffs' Counsel and Xperi Holding to resolve the Fee Request; and

WHEREAS, the Court has not passed and will not pass judgment on the amount of the Fee Request, but requires the parties to provide notice with respect to any agreed-upon payment of attorneys' fees and expenses in cases in which the underlying claims are dismissed on mootness grounds;

NOW, THEREFORE, upon the consent of the Parties and Xperi Holding and subject to approval of the Court:

IT IS HEREBY ORDERED that:

1. Xperi Holding shall attach this Stipulation and Order Regarding Mootness Fee Request, Notice, and Dismissal (the "Order") as an exhibit to a Form 10-K for the fiscal year ended December 31, 2020 that Xperi Holding will file with the United States Securities and Exchange Commission. The filing of this Order as an attachment to a Form 10-K constitutes adequate notice for purposes of Rule 23(e) (the "Notice").
2. Xperi Holding on Defendants' behalf shall pay Plaintiff's Counsel

   $300,000 in full satisfaction of the Fee Request within ten (10) business days of the entry of this Order, to an account designated by Prickett, Jones & Elliott, P.A. The foregoing payment shall fully satisfy and resolve the Fee Request and Plaintiff's Counsel shall not seek any additional fees, expenses, or costs related to this action from any source.
3. Plaintiff shall file with the Court an affidavit that the Notice has been made in accordance with Paragraph 1 and that payment has been made in accordance with Paragraph 2 above (the "Affidavit") no later than five (5) business days after the Notice is publicly filed and payment made.
4. Upon filing of the Affidavit:
    a. The Register in Chancery is directed to close this action on the docket; and

b. The Court will no longer retain any jurisdiction over this action.

Dated: December 4, 2020

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Counsel for Defendants and InterestedParty Xperi Holding

IT IS SO ORDERED this date of , 2020.

Vice Chancellor Joseph R. Slights, III

This document constitutes a ruling of the court and should be treated as such.

Court: DE Court of Chancery Civil Action

Judge: Joseph Slights

File & Serve Transaction ID: 66160622

Current Date: Dec 07, 2020

Case Number: 2020-0376-JRS

Case Name: Local 464A United Food and Commercial Workers Union Pension Fund v. DarcyAntonellis

Court Authorizer: Joseph Slights

/s/ Judge Joseph Slights