AMBARELLA INC
Form 10-K
March 29, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 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 January 31, 2019

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to

Commission File Number: 001-35667

AMBARELLA, INC.

(Exact name of registrant as specified in its charter)

Cayman Islands	98-0459628
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
3101 Jay Street Santa Clara, California	95054
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (408) 734-8888

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

Title of each class	Name of each exchange on which registered
Ordinary Share, $0.00045 Par Value Per Share	NASDAQ Global 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 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 and (2) has been subject to such filing requirements for the past 90 days. YES NO

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

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

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

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

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). YES NO

The aggregate market value of the voting and non-voting ordinary shares held by non-affiliates of the Registrant as of July 31, 2018, was approximately $1.0 billion based upon the closing price reported for such date on the NASDAQ

Global Market. For purposes of this disclosure, ordinary shares held by persons known to the Registrant (based on information provided by such persons and/or the most recent schedule 13Gs filed by such persons) to beneficially own more than 5% of the Registrant's ordinary shares and ordinary shares held by officers and directors of the Registrant have been excluded because such persons may be deemed to be affiliates. This determination is not necessarily a conclusive determination for other purposes.

Number of ordinary shares, $0.00045 par value, outstanding as of March 25, 2019: 32,724,794 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Certain information is incorporated into Part III of this report by reference to the Proxy Statement for the Registrant's annual meeting of shareholders to be held on or about June 6, 2019 to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act. The forward-looking statements are contained principally in, but not limited to, the sections titled “Business,” “Risk Factors,” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” as well as elsewhere in this Annual Report on Form 10-K. Forward-looking statements are identified by the use of the words “would,” “could,” “will,” “may,” “expect,” “believe,” “should,” “anticipate,” “if,” “future,” “intend,” “plan,” “estimate,” “predict,” “potential,” “target,” “seek,” “continue,” “foreseeable” or “forecast” and phrases, including the negatives of these terms, or other variations of these terms, that denote future events. Forward-looking statements include, but are not limited to, information concerning our possible or assumed future results of operations, competitive position, industry environment, potential growth opportunities and the effects of competition, our product development strategy and areas of focus, our market opportunity, our ability to develop new solutions, including our ability to integrate and apply acquired technologies to our solutions, our future financial and operating performance, sales and marketing strategy, investment strategy and the results of our investments, research and development, customer and supplier relationships, inventory levels, customer demand and our ability to secure design wins, industry trends, our cash needs and capital requirements, and expectations about seasonality, taxes, and operating expenses. These statements reflect our current views with respect to future events and our potential financial performance and are subject to risks and uncertainties that could cause our actual results and financial position to differ materially and adversely from what is projected or implied in any forward-looking statements included in this Annual Report on Form 10-K.

Factors that could affect such forward-looking statements include, but are not limited to, risks associated with revenue being generated from new customers or design wins, neither of which is assured; our ability to retain and expand customer relationships and to achieve design wins; the commercial success of our customers’ products; our growth strategy; our ability to anticipate future market demands and future needs and preferences of our customers; our ability to introduce new and enhanced solutions; the expansion of our current markets and our ability to successfully enter new markets; anticipated trends and challenges, including competition, in the markets in which we operate; our expectations regarding computer vision; our ability to effectively generate and manage growth; our ability to retain key employees; the potential for intellectual property disputes or other litigation; the risks described under Item 1A of Part I—“Risk Factors,” Item 7 of Part II—“Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and elsewhere in this Annual Report on Form 10-K; and those discussed in other documents we file with the Securities and Exchange Commission. You are cautioned not to place undue reliance on the forward-looking statements, which speak only as of the date of this Annual Report on Form 10-K. We have no obligation (and expressly disclaim any such obligation) to update or alter any forward-looking statements, whether as a result of new information or otherwise except as otherwise required by securities regulations.

For purposes of this Annual Report, the terms “Ambarella”, “the Company”, “we”, “us” and “our” refer to Ambarella, Inc. and its consolidated subsidiaries.

PART I

ITEM 1. BUSINESS

Overview

We are a leading developer of semiconductor processing solutions for video that enable high-definition, or HD, video capture, analysis, sharing and display. A device that captures video includes four primary components: a lens, an image sensor, a video processor and storage memory. The video processor is the most complex of these four primary components as it converts raw video input into a format that can be stored and distributed efficiently and, in some cases, analyzes the video data to automate processes and make intelligent decisions. We combine our processor design capabilities with our expertise in video and image processing, computer vision algorithms and software development to provide a technology platform that is designed to be easily scalable across multiple applications in a variety of markets and enable rapid and efficient product development for our customers. Our system-on-a-chip, or SoC, designs fully integrate HD video processing, image processing, computer vision functionality, audio processing, and system functions onto a single chip, delivering exceptional video and image quality at high compression rates, differentiated functionality and low power consumption.

The flexibility of our technology platform enables us to deliver our solutions for numerous applications in multiple markets. We initially focused our technology platform on the broadcast infrastructure market, where we were able to differentiate our solutions for broadcast customers based on high performance, low power consumption, transmission and storage efficiency and small form factor. Leveraging these same capabilities, we then designed high-performance solutions for the camera market. As a result of the advantages of our solutions, we became a leading provider of video processing solutions for cameras that capture both HD video and high-resolution still images simultaneously, such as camcorders, pocket video cameras, wearable cameras and IP security cameras.

Over the last several years, we have been expanding our development efforts on computer vision technology that complements our image processing and video compression technology. We believe that enhanced computer vision functionality is critical both to our current video markets, such as IP security cameras, as well as future markets such as automotive OEM cameras for advanced driving assistance systems, or ADAS, autonomous vehicles, and in the future, robotic applications. Our development efforts focused on creating advanced computer vision algorithms and high-performance, low-power hardware platforms to enhance processing acceleration, which we refer to as our CVflow architecture. The CVflow architecture supports a variety of computer vision algorithms, including stereo obstacle detection and terrain mapping technology, and allows customers to differentiate their products by porting their own algorithms and neural networks to our CVflow-based chips. In 2017, we introduced our first computer vision semiconductor chip, the CV1 SoC. In 2018, we introduced three new computer vision based SoCs to enable our customers to develop intelligent camera systems for a variety of markets at different feature levels.

Our revenue over the last three years has been generated primarily from sales of our solutions for incorporation into specialized video and image capture devices such as wearable sports cameras, automotive aftermarket cameras, IP security cameras and cameras incorporated into unmanned aerial vehicles, or UAVs or drones. While we will continue to address these markets, we intend to primarily focus our development efforts on computer vision applications for the professional and consumer IP security camera, including cameras for the connected home, the automotive OEM and robotics markets. In the IP security camera market, our computer vision platform enables features such as motion detection, people counting and tracking, package and object detection, and facial recognition. In the automotive market, we supply solutions for video recorders, in-cabin and driver monitoring cameras, electronic mirrors, around view monitoring, front camera advanced driving assistance systems, and autonomous driving systems. We have also sought to establish partnerships with software developers for the automotive market to enable advanced artificial intelligence, or AI, features such as object classification, free space detection, path planning, and driver monitoring.

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We sell our solutions to leading original design manufacturers, or ODMs, and original equipment manufacturers, or OEMs, globally. In the automotive market, we may sell our solutions to Tier 1 suppliers that develop and sell devices incorporating our solutions to automotive OEMs. We refer to ODMs and Tier 1 suppliers as our customers and OEMs as our end customers, except as otherwise indicated or as the context otherwise requires. In the camera market, our video processing solutions are designed into products from leading OEMs including Axis Communications AB, Avigilon Corporation, Dahua Technology Co., Ltd., Dajiang Innovation Technology Inc., or DJI, Denso Ten Limited, Garmin Ltd., GoPro Inc., or GoPro, Hikvision Digital Technology Co., JVC Kenwood Corporation and affiliated entities, Nest Labs (owned by Google LLC, which is owned by Alphabet, Inc.), Pelco by Schneider Electric SE, Ring, Inc. (owned by Amazon, Inc.), Robert Bosch GmbH and affiliated entities, Thinkware Corporation, Vivotek, and XiaoYi Technology Co., Ltd., who source our solutions from ODMs including Chicony Electronics Co., Ltd., Dynacolor, Inc., Flex Ltd., and affiliated entities, affiliated entities of Hon Hai Precision Industry Co., Ltd., Jabil Circuit, Inc., Sercomm Corporation, and Sky Light Digital Ltd. We believe our relationships with leading ODMs and OEMs provide us with insight into product roadmaps and trends in the marketplace, which we intend to leverage to identify new opportunities and applications for our solutions. We sell our solutions worldwide using our direct sales force and our distributors, including Wintech Microelectronics Co., Ltd., or Wintech. Sales through Wintech represented approximately 58%, 59% and 60% of our revenue for the fiscal years ended January 31, 2019, 2018, and 2017, respectively.

We employ a fabless manufacturing strategy and are currently shipping the majority of our solutions in the 28 nanometer, or nm, process node, although our most recently introduced SoCs are developed in the 14nm and 10nm process nodes. Currently, the majority of our SoCs are supplied by Samsung Electronics Co., Ltd., or Samsung. As of January 31, 2019, we had 750 employees worldwide, approximately 81% of whom are in research and development. Our headquarters are located in Santa Clara, California, and we also have research and development design centers in Taiwan, China and Italy and business development offices in Taiwan, China, Japan and South Korea. For our fiscal years ended January 31, 2019, 2018 and 2017, we recorded revenue of $227.8 million, $295.4 million and $310.3 million, respectively. For the fiscal year ended January 31, 2019, we incurred a net loss of $30.4 million. For the fiscal years ended January 31, 2018 and 2017, we recorded net income of $18.9 million and $57.8 million, respectively. We have generated cash from operations in each of our fiscal years starting from 2009.

Ambarella was founded and incorporated in the Cayman Islands in January 2004. Our registered address is PO Box 309GT, Ugland House, South Church Street, George Town, Grand Cayman, Cayman Islands. The address of our U.S. operating subsidiary is Ambarella Corporation, 3101 Jay Street, Santa Clara, California. The Securities and Exchange Commission, or SEC, maintains a website at www.sec.gov that contains reports, proxy, and information statements, and other information regarding registrants that file electronically. You may also obtain copies of our Forms 10-K, 10-Q, 8-K, and other filings with the SEC, and all amendments to these filings, free of charge, by visiting the Investor Relations page on our website (http://investor.ambarella.com) as soon as reasonably practicable following our filing of any of these reports with the SEC. Information on our website is not incorporated into this Annual Report on Form 10-K or our other securities filings and is not a part of such filings.

Industry Background

The requirements for cameras in the markets we address are consistently evolving. For our key target markets of IP security cameras, automotive and industrial and robotics applications, these requirements center around computer vision functionality, video definition and frame rates, ability to capture high-quality still images and video, and advanced video features:

- Computer Vision. Computer vision represents the field of methods for acquiring, processing, analyzing, and understanding images and high-dimensional data from the real world in order to automate and integrate a wide range of processes. Computer vision is becoming increasingly important for the development of intelligent video camera

systems. In the IP security camera market, computer vision can be used for various functions including motion detection to trigger alarms, the counting and tracking of people, and facial recognition. In the automotive market, the application of computer vision for ADAS is increasingly being used to help drivers with functions that include lane detection warning, forward collision warning, blind spot detection, and driver monitoring. Support for stereo video obstacle detection, which utilizes stereo cameras to perceive depth, provides an important augmentation to monocular computer vision processing, resulting in an extra margin of safety for autonomous driving and other applications, as stereo cameras can detect obstacles without relying on prior training. The application of computer vision may also be used to help control the video encoding process to reduce video bitrates and maximize network efficiency.

- Higher Definition and Higher Frame Rates. The demand for enhanced video resolution has been increasing across camera markets. Consumers expect video quality to be closer to high-resolution still images, which continues to drive the transition from standard definition to Full HD and beyond. Similarly, as new display technologies enable higher resolutions and higher frame rates, we believe consumer demand will continue to drive the requirement for ultra high-definition, or UHD or 4K, video capture and transmission.

- Ability to Capture High-Quality Still Images and Video. Historically, consumers purchased devices that either provide high-quality image capture or record high-quality video. This was the result of consumer preference, as reasonably priced and sized devices would provide only one of those attributes. However, as a result of technological improvements, consumer devices that deliver both attributes have proliferated to the point that a pure video capture device or still image capture device is becoming uncommon. Increasingly, devices are able to simultaneously capture HD video and high-quality still images without adversely impacting the quality of either. We believe devices that can capture Full HD video while encoding a second mobile resolution video for uploading to the Internet or streaming over a Wi-Fi network will expand consumer demand for specialized video capture devices. Additionally, we believe advanced low-light processing including high dynamic range and high-ISO processing will continue to improve image quality even in challenging lighting conditions. We believe image stabilization technology enables stable video recording during high-motion conditions, which are often encountered when using sports cameras and UAVs.
- Connectivity. Integrated wireless capability using wireless links such as Bluetooth and Wi-Fi has become a prevalent feature across many classes of video capture devices. Consumers want to watch, control and capture real-time video using their smartphones as the remote control and viewer for wirelessly enabled wearable and sports cameras. Additionally, rather than storing images and video to local media and transferring to a computer later, consumers are demanding the ability to wirelessly transfer and share their video content to websites such as YouTube, Facebook and other online media albums. In video security applications, connectivity to cloud services enable smart home monitoring in real-time through smartphones or tablets. The storage of video in the cloud also provides protection against theft of the video content and enables users the capability to play back the stored video.
- Ability to Deliver Feature-Rich Video. The addition of de-warping capability allows cameras to utilize a wide angle or “fish eye” lens to cover a wide viewing area. In security applications this capability can allow a single camera to replace multiple cameras and may also eliminate the need for mechanical pan-tilt-zoom in the cameras. In automotive markets, the ability to combine and display images captured by multiple cameras can allow the automotive camera recorder to capture and display images from the front, rear and sides of the car, which is referred to as around view monitoring. Wide dynamic range, or WDR, and high dynamic range, or HDR, processing capabilities provide greater dynamic range between the lightest and darkest areas of an image, permitting captured still images to reveal details that would otherwise be lost against a bright background.

Our Competitive Strengths

Our platform technology solutions provide performance attributes that satisfy the stringent demands of the camera market, enable integration of HD video and image capture capabilities in portable devices, provide computer vision capabilities that address the evolving needs of the IP security, automotive and other markets, and meet the highest standards of the infrastructure market. We believe that our leadership in HD video and image processing applications is the result of our competitive strengths, including:

- Proprietary Computer Vision Architecture. Our proprietary computer vision processing architecture, known as CVflow, uses a flexible computer vision hardware engine programmed with a high level algorithm description to achieve increased performance while minimizing die size and power consumption. The CVflow architecture specifies data flow connections between a set of optimized computer vision operators, such as the convolution and matrix multiply functions that are specifically optimized for deep learning algorithms. The CVflow architecture supports a variety of computer vision algorithms, including stereo obstacle detection and terrain mapping technology, and allows customers to differentiate their products by porting their own algorithms and neural networks to our CVflow-based chips.
- High-Performance, Low Power Video and Image Algorithm Expertise. Our solutions provide Full HD and UHD video at exceptional resolution and frame rates. Our extensive algorithm expertise, which facilitates efficient video and image compression, enables our solutions to achieve low power consumption without compromising performance. Our solutions achieve high storage and transmission efficiencies through innovative and complex video and image compression algorithms that significantly reduce the output bitrate. This smaller storage footprint directly benefits the performance of our solutions in several ways including lower memory storage requirements and reduced

bandwidth needs for transmission, which is more conducive to sharing content between devices. These benefits are particularly important in transcoding, the digital-to-digital conversion of one encoding format to another, and video cloud applications. Our solutions can enable high-performance image capture of up to 30 32-megapixel still images per second. Our solutions can deliver clear images in low light conditions because of our 3D motion compensated temporal filtering, or MCTF, and multiple exposure processing. Additionally, our WDR and HDR processing capabilities provide greater dynamic range between the lightest and darkest areas of an image, permitting captured still images to reveal details that would otherwise be lost against a bright background. Our advanced de-warping capability enables cameras to use wide angle lenses to capture images from a wide area, making it ideal for a variety of IP security camera applications, as well as 3D electronic image stabilization and surround view for automotive applications.

- Proprietary Video Processing Architecture. Our proprietary video processing architecture is designed to efficiently integrate our advanced compression algorithms into our SoCs to offer exceptional storage and transmission efficiencies at lower power across multiple products and end markets. We engineered our very-large-scale integration, or VLSI, architecture with a focus on high-performance video compression as opposed to solutions that are based on a still image processing architecture with add-on video capabilities. Due to our primary focus on video processing compression, we believe that our solutions offer exceptional performance metrics with lower power requirements and reduced die sizes. Our integrated algorithms and architecture also enable simultaneous processing of multiple video and image streams.
- Highly Integrated SoC Solutions Based on a Scalable Platform. Our product families leverage our core high-performance video processing architecture combined with an extensive set of integrated peripherals, which enables our platform to address the requirements of a variety of applications and end markets. Traditional solutions have generally relied upon significant customization to meet the specific requirements of each market, resulting in longer design cycles and higher development costs. Our flexible and highly-scalable platform enables us to address multiple markets with reduced design cycles and costs. Our platform also enables us to develop fully integrated SoC solutions that provide the system functionalities required by our customers on a single chip. Our extensive system integration expertise enables us to integrate core video processing functionality with many peripheral functions such as multiple inputs and outputs, lens controllers, flash controllers and remote control interfaces to reduce system complexity and interoperability issues. Furthermore, we have successfully migrated our process nodes from 130nm to 10nm since our founding and have a proven track record of developing and delivering multiple solutions with first-pass silicon success.
- Comprehensive and Flexible Software. Our years of investment in developing and optimizing our comprehensive and flexible software serve as the foundation of our high-performance video application solutions. Key components of our software include highly customized middleware that integrates many unique features for efficient scheduling and other system-level functions, and firmware that is optimized to reduce power requirements and improve performance. In addition, we provide to our customers fully-functional software development kits with a suite of application programming interfaces or APIs, which allow them to rapidly integrate our solution, adjust product specifications and provide additional functionality to their systems, thereby enabling them to differentiate their product offerings and reduce time to market.
- Key Global Relationships with Leading OEM and ODM Customers. Our solutions have been designed into top-tier OEM brands currently in the market. We have established collaborative relationships with most of the leading ODMs and OEMs that serve our primary markets. We intend to leverage these relationships to identify new opportunities and applications for our solutions, and we intend to continue to actively engage with ODMs and OEMs at every stage of their design cycles. We actively engage with OEMs on design specifications and with ODMs on product implementation. Additionally, approximately 71% of our employees are located in Asia, primarily in Taiwan and China, strategically placing us near many of our customers and allowing us to provide attentive sales, design and technical support and to strengthen our customer relationships.

Products

Our technology platform delivers a high-performance, low power video and image processing solution with computer vision functionality that can be tailored with our software solution to meet the specific needs of multiple end markets. Our HD video and image processing SoCs, based on our proprietary video processing architecture, are highly configurable and enable our customers to deliver exceptional quality video and still imagery in small, easy-to-use devices with low power requirements. Our computer vision architecture, incorporated into our new computer vision family of SoCs, extract and process data from video stream, enabling our customers to develop intelligent camera systems. Our customized software solutions include firmware, middleware and software development kits to optimize system-level functions and allow rapid integration of our solution into customer products and tailor specifications to customer requirements. We also provide customers in all of our core markets with guidelines known as reference designs so that they can efficiently incorporate our solutions into their product designs.

In addition to enabling small device size and low power consumption, our SoC solutions make possible differentiated functionalities, such as simultaneous video and image capture, multiple-stream video capture, image stabilization and wireless connectivity. We intend to leverage our core technology platform to address other video processing markets that have high-performance, robust connectivity, low latency and low power requirements. We believe that computer vision functionality on the SoC, such as face recognition, object identification and avoidance and motion detection, will significantly expand the addressable market for our SoC solutions.

We currently sell our solutions into the following end markets:

- Professional IP Security Cameras. These cameras are used for video monitoring and security surveillance in professional applications. Our solutions enable the streaming of multiple video streams to enable remote monitoring at multiple locations. Embedded computer vision intelligence supports advanced analytics including motion detection, people counting and tracking, facial recognition, and retail behavior analysis. The cameras often have the ability to operate in low light conditions and over wide temperature ranges in order to be used in outdoor environments.
- Consumer IP Security Cameras. Consumer IP security cameras are designed for home or small business use and are typically connected to cloud services and applications via home networks using WiFi. These cameras may require very low bitrate operation to support HD resolution over limited bandwidth broadband connections, while small form factors or battery powered devices may require very low power operation. The implementation of intelligent motion detection may reduce the number of false alarms and facial recognition capability allows cameras to recognize known persons.
- Automotive Cameras. We sell solutions into several automotive markets both for aftermarket and OEM applications. In the automotive aftermarket, we sell solutions for small video cameras mounted on board vehicles to record traffic accidents and help establish records for insurance and liability purposes. Our MotorVu™ 3D 360° Surround View reference design for the automotive OEM market brings high quality HD video to multi-camera parking assistance applications and features a dedicated video engine to combine multiple HD video streams for 3D scene rendering. Also, for the OEM market, electronic mirrors utilize cameras and LCD displays to augment optical rear view and side view mirrors to provide a wider, unobstructed field of view, and help detect objects in blind spots. Our CV22 SoC enables performance necessary to exceed the requirements of Europe’s New Car Assessment Program, or NCAP, for applications such as lane keeping, automatic emergency braking, or AEB, intelligent headlight control, and speed assistance functions. With our new computer vision family of SoCs, we are also targeting cabin and driver monitoring, ADAS and autonomous driving applications.
- Wearable Cameras including Sports, Commercial and Social Media. Durable cameras that provide HD video quality increasingly include embedded connectivity to share and display video. Our low power, high-resolution and connected solutions can be found in a variety of cameras in this end market.
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UAVs or Drones. These cameras are used for capturing aerial video or photographs. Our high-performance, high frame rate and low power architecture enables improved functionality with Full HD video capture. In addition, our ability to provide high-resolution still image capture and HD video capture simultaneously enables hybrid capability for the user.

The chart below describes our current product lines and target markets:

Technology

Our semiconductor processing solutions enable computer vision processing, HD and UHD (up to 3840x2160p60) video and image processing, video compression, sharing and display while offering exceptional power, size and performance characteristics.

Key differentiators of our technology include:

- algorithms to compress video signals with high compression and power efficiency at multiple operating points;
- algorithms for high-speed image processing with high image quality and power efficiency;
- flexible CVflow computer vision processing engines to support UHD performance levels for deep learning and stereo-based algorithms with power and die size efficiency;
- optimized deep learning algorithms for multi class object detection, including vehicles, pedestrians, cycles, traffic signs and traffic lights;
- stereo obstacle detection to provide robust safety in the event of obstacles that are not in the training data;
- full autonomous algorithm stack for automotive and drone applications, including fusion for multiple cameras and sensor modalities, mapping and localization algorithms and planning;
- scalable architecture that covers the gamut of consumer and professional HD video camera and encoding applications from Full HD to UHD performance levels;
- ability to encode multiple video streams simultaneously to support simultaneous recording and video streaming or streaming to multiple devices with different resolutions;
- ability to capture, process and encode multiple image sensors simultaneously to support multiple viewpoints, including surround view and virtual reality applications;
- algorithms to stabilize video from camera motion in challenging conditions, such as sports and UAV cameras;

- low-power architecture with minimal system memory footprint;
- programmable architecture that balances flexibility, quality, power and die size;
- full software development kit comprised of APIs to facilitate integration into customers' products; and
- powerful CPUs and dedicated hardware to support advanced analytics functions.

Our technology platform, comprised of our video, image and computer vision processors, is based on a high-performance, low-power architecture supported by a high level of system integration. The building blocks of our platform are illustrated below:

Our technology platform enables the capture of high-resolution still images and HD video while simultaneously encoding HD video for high-quality storage and lower resolution video for Internet sharing and wireless networking. Multi stream video capture enhances the consumer experience by offering the ability to instantaneously share captured video without having to go through a transcoding process. Our computer stereo vision processing solutions provide the ability to detect generic objects without training, allowing more robust decisions to be made in applications such as autonomous driving.

AmbaClear

Our proprietary image signal processing architecture, known as AmbaClear, incorporates advanced algorithms to convert raw sensor data to high-resolution still and HD video images concurrently. Image processing algorithms include sensor, lens and color correction, demosaicing, which is a process used to reconstruct a full color image from incomplete color samples, noise filtering, detail enhancement and image format conversion. For example, raw sensor data can be captured at up to 16-megapixel resolution at 60 frames per second and filtered down to two megapixels for HD video processing while selected 16-megapixel frames are concurrently processed by the still image processor. This image processing reduces noise in the input video and improves video quality resulting in better storage and transmission efficiencies. Our WDR and HDR processing capabilities handle greater dynamic range between the lightest and darkest areas of an image, permitting video images to reveal details that would otherwise be lost against a bright background. Our advanced de-warping capability enables cameras to use wide angle lenses to capture images from a wide area, making it ideal for a variety of IP security camera and surround view applications.

AmbaCast

Our proprietary HD video processing architecture, known as AmbaCast, incorporates advanced algorithms for motion estimation, motion-compensated 3D temporal filtering, mode decision and rate control. Successful implementation of these computationally intensive steps has helped us maximize compression efficiency. We support all three compression profiles—baseline, main and high—as specified in the H.264 video compression standard. We also support the main profile H.265 video compression standard with up to 2x better compression efficiency compared to our H.264 video compression technology.

CVflow

Our proprietary computer vision processing architecture, known as CVflow, uses a flexible computer vision hardware engine programmed with a high level algorithm description to achieve increased performance while minimizing die size and power consumption. This description allows the hardware to maximize use of its resources by exploiting all available parallelism without software intervention. The CVflow architecture specifies data flow connections between a set of optimized computer vision operators, such as the convolution and matrix multiply functions that are specifically optimized for deep learning algorithms. The CVflow architecture supports a variety of computer vision algorithms, including stereo obstacle detection and terrain mapping technology. Our platform allows customers to differentiate their products by porting their own algorithms and neural networks to our CVflow-based chips using industry-standard training tools and frameworks.

Computer Vision Technology

Computer vision is a core technology that complements our image processing and video compression technology. Our current SoC solutions have up to four high performance ARM processors with NEON™ acceleration that provide a flexible and cost-effective manner in which to run computer vision algorithms. We are focusing on developing advanced computer vision algorithms and high-performance, low-power hardware acceleration, which is critical to our current video markets, including IP security, wearable, and UAV cameras, as well as automotive cameras for OEM applications. A significant feature of our computer vision SoCs is support for stereo obstacle detection, which utilizes stereo cameras to perceive depth. We believe that stereo depth information provides an important augmentation to monocular computer vision processing, resulting in an extra margin of safety for autonomous driving and other applications. Monocular processing depends on training to detect obstacles, and may not detect obstacles that are not represented in the training set. Stereo cameras detect obstacles without relying on training because the depth information is used to directly construct a three-dimensional model of the camera’s surroundings, including any obstacles.

Design Methodology

The success of our technology platform stems from our algorithm-driven design methodology. We test and verify our algorithms on our proprietary architectural model prior to implementing our algorithms in hardware. Our advanced verification methodology validates our approach through simultaneous modeling of architecture, algorithms and the hardware itself. This redundant approach enables us to identify and remediate any weaknesses early in the development cycle, providing a solid foundation on which we build our hardware implementation, and enhances our ability to achieve first-pass silicon success. We have a history of using several process nodes from 130nm through 10nm. In fiscal year 2015, we began investing in development of our next generation SoCs in the 14nm process node and announced our first 14 nm SoC in January 2016. In fiscal year 2017, we began investing in development of our next generation SoCs in the 10nm process node, and we announced our first 10nm SoC in January 2018. We possess extensive expertise in video and imaging algorithms as well as deep sub-micron digital and mixed-signal design experience.

SoC Solution

Our SoC designs integrate HD and UHD video processing, image processing, applications processing and system functions onto a single chip, delivering exceptional video and image quality with differentiated features, including advanced wireless connectivity. Our multi-core DSP architecture is highly scalable and balances software programmability with hardware-accelerated performance to achieve extremely low power consumption and maximize camera battery life. The programmable architecture provides our customers with the flexibility they need to quickly develop a wide range of differentiated products. Additionally, our SoCs integrate mixed signal (analog/digital) functionality and high speed interfaces required for interfacing to advanced high-speed CMOS sensors and industry standard interfaces such as USB 3.0 and HDMI 2.0. Our newest SoCs also feature our fully-programmable and highly-efficient CVflow architecture to provide significant computer vision performance with very low power consumption. Recently introduced SoCs include the following:

- Our 10nm CV22 SoC, which we announced in January 2018, is the second chip in our CVflow family and provides computer vision processing required for intelligent home monitoring, automotive, drone, and wearable cameras. The CV22 SoC encodes H.264 Advanced Video Coding, or AVC, and H.265 high efficiency video coding, or HEVC, video at rates of up to 4Kp60, with multi-stream support. The CV22 SoC includes a quad-core 1.2 GHz ARM® Cortex® A53 CPU with NEON™ DSP extensions and floating point unit to provide power for features such as 360 degree de-warping and lens distortion correction, multi-exposure HDR and WDR processing, LED flicker mitigation, and multi-sensor support for multi-imager cameras.
- Our 10nm CV2 SoC, which we announced in March 2018, is the third chip in our CVflow family and provides computer vision and stereovision processing required for the next generation of intelligent automotive, security, and drone cameras. The CV2 SoC encodes AVC and HEVC video at rates of up to 4Kp90, with multi-stream support. The CV2 SoC includes a quad-core 1.2 GHz ARM® Cortex® A53 CPU with NEON™ DSP extensions and floating point unit to provide power for features such as 360-degree de-warping and lens distortion correction, multi-exposure HDR and WDR processing, LED flicker mitigation, and multi-sensor support for multi-imager cameras. CV2's CVflow computer vision processing provides up to 20 times the convolutional neural network, or CNN, processing performance of CV1.
- Our 10nm CV25 SoC, which we announced in January 2019, is the latest chip in our CVflow family and provides computer vision processing required for the next generation of affordable and intelligent home monitoring, professional surveillance, and aftermarket automotive solutions, including smart dash-cameras, driver monitoring systems (DMS), and electronic mirrors. We believe that the CV25 SoC will enable cameras to perform advanced artificial intelligence (AI) features like facial recognition in real-time on the camera rather than in the cloud. The CV25 SoC encodes AVC and HEVC video at rates of up to 4Kp30, and uses SmartAVC™ and SmartHEVC™ intelligent rate control to achieve low bitrates and minimize cloud storage costs. The CV25 SoC also includes a quad-core 1 GHz ARM® Cortex®-A53 CPU with NEON™ DSP extensions and floating point unit.
- Our S6Lm SoC, which we are announcing in April 2019, is designed for a wide range of professional IP and home monitoring cameras and includes 4K HDR processing and multi-streaming. The S6Lm SoC delivers 5Mp30 + 720p30 + 5Mp1 maximum encoding performance. The S6Lm SoC features a quad-core ARM Cortex A53 CPU for advanced analytics, including object and person detection to reduce false alarms and maximize battery life in battery-powered designs. The S6Lm uses our next-generation image signal processor to deliver high-quality imaging in low-light conditions, while its HDR processing extracts high image detail in high-contrast scenes.

Software Development Kits

We provide to our customers fully-functional software development kits with a suite of application programming interfaces or APIs, which allow customers to rapidly integrate our solution, adjust product specifications and provide additional functionality to their systems, thereby enabling them to differentiate their product offerings and reduce time to market. We have software development kits for all of our core markets. For example, in the security market, we provide a fully-featured IP Camera Software Development Kit, or the IP Camera SDK, based on a Linux™ operating system. The IP Camera SDK includes middleware software with multi-streaming capability, control for our 4K H.264/H.265 encoder hardware, support for peripherals such as sensors and Wi-Fi chipsets, and other functions needed to build a 4K Ultra HD multi-streaming IP camera. The IP Camera SDK leverages our SoCs' capabilities for 4K video, multi-streaming, HDR, video de-warping, video analytics, and multi-sensor connectivity. For example, the IP Camera SDK enables an IP camera to record a stream locally at 4K resolution while streaming another video to a remote client over an Ethernet connection at reduced resolution. We also provide extensions to the IP Camera SDK to address specific submarket segments such as doorbells and battery-powered cameras, which can take advantage of the fast-boot, low power, and advanced multi-view video modes of our chips.

We also provide a toolkit to accelerate the development of computer vision algorithms onto our hardware. We provide tools to map algorithms from commonly used computer vision frameworks such as Caffe or Tensorflow into our proprietary CVflow architecture. We also provide a framework for development of higher-level computer vision tasks. This enables our customers to write complex computer vision algorithms with multiple tasks running in

parallel, as would be required in applications such as autonomous driving.

Customers

We sell our solutions to leading original design manufacturers, or ODMs, and original equipment manufacturers, or OEMs, globally. In the automotive market, we may sell our solutions to Tier 1 suppliers that develop and sell devices incorporating our solutions to automotive OEMs. We refer to ODMs and Tier 1 suppliers as our customers and OEMs as our end customers, except as otherwise indicated or as the context otherwise requires. In the camera market, our video processing solutions are designed into products from leading OEMs including Axis Communications AB, Avigilon Corporation, Dahua Technology Co., Ltd., DJI, Denso Ten Limited, Garmin Ltd., GoPro, Hikvision Digital Technology Co., JVC Kenwood Corporation and affiliated entities, Nest Labs (owned by Google LLC, which is owned by Alphabet, Inc.), Pelco by Schneider Electric SE, Ring, Inc. (owned by Amazon, Inc.), Robert Bosch GmbH and affiliated entities, Thinkware Corporation, Vivotek, and XiaoYi Technology Co., Ltd., who source our solutions from ODMs including Chicony Electronics Co., Ltd., Dynacolor, Inc., Flex Ltd., and affiliated entities, affiliated entities of Hon Hai Precision Industry Co., Ltd., Jabil Circuit, Inc., Sercomm Corporation, and Sky Light Digital Ltd.

Sales to customers in Asia accounted for approximately 87%, 79% and 73% of our total revenue in the fiscal years ended January 31, 2019, 2018 and 2017, respectively. As many of our OEM end customers or their ODM manufacturers are located in Asia, we anticipate that a majority of our revenue will continue to come from sales to customers in that region. Although a large percentage of our sales are made to customers in Asia, we believe that a significant number of the products designed by these customers and incorporating our SoCs are then sold to consumers globally. For each fiscal year ended January 31, 2019, 2018 and 2017, 98% of our revenue was attributable to sales of our solutions into the camera markets and 2% of our revenue was attributable to sales of our solutions into the infrastructure market. To date, all of our sales have been denominated in U.S. dollars.

We work closely with our end customer OEMs and ODMs throughout their product design cycles that often last six to nine months for the camera market, although new products within the camera market may have longer design cycles, particularly those implementing advanced features. As a result, we are able to develop long-term relationships with our customers as our technology becomes embedded in their products. Consequently, we believe we are well positioned to not only be designed into our customers' current products, but also to continually develop next-generation HD video and image processing solutions for their future products.

The product life cycles in the camera market typically range from six to 18 months. We expect that product lifecycles in the automotive OEM and the industrial and robotics markets will typically be longer than 24 months, as new product introductions occur less frequently. For many of our solutions, early engagement with our customers' technical staff is necessary for success. To ensure an adequate level of early engagement, our application and development engineers work closely with our customers to adjust product specifications and add functionality into their products.

In fiscal year 2019, the customers representing 10% or more of revenue were Wintech, the Company's distributor, and Chicony, a direct ODM customer, which accounted for approximately 58% and 16% of total revenue, respectively. We currently rely, and expect to continue to rely, on a limited number of customers for a significant portion of our revenue.

Sales and Marketing

We sell our solutions worldwide using our direct sales force and our distributors. We have direct sales personnel covering the United States, Asia and Europe, and we operate sales offices in Santa Clara, California and Hong Kong, and business development offices in China, Japan, South Korea, and Taiwan. In addition, in each of these locations we employ a staff of field applications engineers to provide direct engineering support locally to our customers.

Our sales cycles typically require a significant investment of time and a substantial expenditure of resources before we can realize revenue from the sale of our solutions, if any. Our typical sales cycle consists of a multi-month sales and development process involving our customers' system designers and management and our sales personnel and software engineers. If successful, this process culminates in a customer's decision to use our solutions in its system, which we refer to as a design win. Our sales efforts are typically directed to the OEM of the product that will incorporate our video and image processing solution, but the eventual design and incorporation of our SoC into the product may be handled by an ODM or Tier I supplier on behalf of the OEM. Volume production may begin within six to 18 months after a design win, depending on the complexity of our customer's product and other factors upon which we may have little or no influence. Once our solutions have been incorporated into a customer's design, they are likely to be used for the life cycle of the customer's product. Conversely, a design loss to a competitor will likely preclude any opportunity for future revenue from such customer's product.

The end markets into which we sell our products have seen significant changes as consumer preferences have evolved in response to new technologies. As a result, the composition of our revenue may differ meaningfully during periods of technology or consumer preference changes. For example, in fiscal year 2011, revenue from sales into the pocket video market represented approximately 40% of our total revenue. The proliferation of smartphones and their ability to capture high-quality video and still images significantly impacted this market, decreasing pocket video cameras' contribution to approximately zero percent of total revenue by fiscal year 2013. Conversely, our total revenue in the 2013-2018 fiscal years was primarily derived from markets for specialized video and image capture devices, such as the wearable camera market, the IP security camera market, the automotive aftermarket and the UAV camera market. While we will continue to address these markets, we intend to primarily focus our development efforts on computer vision applications for the professional and consumer IP security, the automotive OEM and industrial and robotics markets. We expect shifts in consumer use of video capture to continue to change over time, as more specialized use cases emerge and video capture continues to proliferate, which could significantly impact any of these markets.

Our sales are generally made pursuant to purchase orders received approximately four to 18 weeks prior to the scheduled product delivery date, depending upon agreed terms with our customers and the current manufacturing lead time at the time the purchase order is received. These purchase orders may be cancelled without charge upon notification within an agreed period of time in advance of the delivery date, which may be as short as 30 days. Due to the scheduling requirements of our foundry, assembly and test contractors, we generally provide our contractors with our production forecasts and place firm orders for products with our suppliers up to 20 weeks prior to the anticipated delivery date, usually without a purchase order from our own customers. Our standard warranty provides that our SoCs containing defects in materials, workmanship or performance may be returned for a refund of the purchase price or for replacement, at our discretion. We may agree to different warranty terms with specific customers from time to time.

Manufacturing

We employ a fabless business model and use third-party foundries and assembly and test contractors to manufacture, assemble and test our solutions. This outsourced manufacturing approach allows us to focus our resources on the design, sales and marketing of our solutions and avoid the cost associated with owning and operating our own manufacturing facility. Our engineers work closely with foundries and other contractors to increase yields, lower manufacturing costs and improve quality. In addition, we believe outsourcing many of our manufacturing and assembly activities provides us the flexibility needed to respond to new market opportunities, simplifies our operations and significantly reduces our capital requirements. We do not have a guaranteed level of production capacity from any of our suppliers' facilities to produce our solutions. We carefully qualify each of our suppliers and their subcontractors and processes in order to meet the extremely high-quality and reliability standards required of our solutions.

Backlog

Our sales are primarily made through standard purchase orders for delivery of products. Our manufacturing production is based on estimates and advance non-binding commitments from customers as to future purchases. We follow industry practice that allows customers to cancel, change or defer orders with limited advance notice prior to shipment. Given this practice, we do not believe that backlog is a reliable indicator of future revenue levels.

Wafer Fabrication

We have a history of using several process nodes from 130nm through 10nm. We currently manufacture the majority of our solutions in 28nm silicon wafer production process geometry utilizing the services of several different foundries. In fiscal year 2015, we began investing in development in the 14nm process node, and we announced our

first 14nm SoC in January 2016. In fiscal year 2017, we began investing in development in the 10nm process node, and we announced our first 10nm SoC in January 2018. Currently, the majority of our SoCs are supplied by Samsung in facilities located in Austin, Texas and South Korea, from whom we have the option to purchase both fully-assembled and tested products as well as tested die in wafer form for assembly. We also have products supplied by Global UniChip Corporation, or GUC, in Taiwan, from whom we purchase fully-assembled and tested products. The wafers used by GUC in the assembly of our products are manufactured by Taiwan Semiconductor Manufacturing Co., Ltd., or TSMC, in Taiwan.

Assembly and Testing

Samsung subcontracts the assembly and initial testing of the assembled chips it supplies to us to Signetics Corporation and STATS ChipPAC Ltd. In the case of purchases of tested die from Samsung, we contract the assembly to Advanced Semiconductor Engineering, Inc., or ASE. GUC subcontracts the assembly of the products it supplies to us to ASE and Powertech Technology Inc. Final testing of all of our products is handled by King Yuan Electronics Co., Ltd. or Sigurd Corporation under the supervision of our engineers. All test software and related processes for our products are developed by our engineers. We continually monitor the results of testing at all of our test contractors to ensure that our testing procedures are properly implemented.

As part of our total quality assurance program, our quality management system has been certified to ISO 9001:2000 standards. Our foundry vendors are also ISO 9001 certified.

Research and Development

We believe our technology is a competitive advantage and we engage in substantial research and development efforts to develop new products and integrate additional features and capabilities into our HD and UHD video processing solutions, such as computer vision capabilities. We believe that our continued success depends on our ability to both introduce improved versions of our existing solutions and to develop new solutions for the markets that we serve. As of January 31, 2019, 81% of our employees are engaged in research and development. Our research and development team is comprised of both semiconductor and software designers. Our semiconductor design team has extensive experience in large-scale semiconductor design, including architecture description, logic and circuit design, implementation and verification. Our software design team has extensive experience in development and verification of software for the HD video market. Because the integration of hardware and software is a key competitive advantage of our solutions, our hardware and software design teams work closely together throughout the product development process. The experience of our hardware and software design teams enables us to effectively assess the tradeoffs and advantages when determining which features and capabilities of our solutions should be implemented in hardware and in software.

We have assembled a core team of experienced engineers and systems designers in four research and development design centers located in the United States, China, Italy, and Taiwan.

Competition

The global semiconductor market in general, and the video and image processing markets in particular, are highly competitive. We expect competition to increase and intensify as more and larger semiconductor companies enter our markets and as we enter new markets, such as the OEM automotive market. Increased competition could result in price pressure, reduced profitability and loss of market share, any of which could materially and adversely affect our business, revenue and operating results.

Our competitors range from large, international companies offering a wide range of semiconductor products to smaller companies specializing in narrow markets. In the IP security camera market, our primary competitors include AMLogic Inc., Fullhan Microelectronics Co., Ltd., Geo Semiconductor, Inc., HiSilicon Technologies Co., Ltd., or HiSilicon, which is owned by Huawei Technologies Co., Ingenic Semiconductor Co., Ltd., Intel Corporation, or Intel, Movidius Ltd., a subsidiary of Intel, Novatek Microelectronics Corp., or Novatek, OmniVision Technologies, Inc., or OmniVision, Qualcomm Incorporated, or Qualcomm, Realtek Semiconductor Corp., SigmaStar Technology Corp., or SigmaStar, Socionext Inc., or Socionext, an entity created from the merger of the system LSI businesses of Fujitsu Ltd. and Panasonic Corporation, or Panasonic, and Texas Instruments Incorporated, or Texas Instruments, as well as vertically integrated divisions of IP Security camera device OEMs, including Axis Communications AB and Sony

Corporation, or Sony. In the automotive camera market, we compete against Allwinner Technology Co., Ltd., Alpha Imaging Technology Corp., Core Logic, Inc., Novatek, NVIDIA Corporation, or NVIDIA, NXP Semiconductors N.V., OmniVision, Qualcomm, Renesas Electronics Corporation, SigmaStar, Sunplus Technology Co. Ltd., Texas Instruments and Xilinx Inc. In the wearable sports camera market, our primary competitors are vertically integrated divisions of camera device OEMs, including Sony, Panasonic, HiSilicon and Socionext. Our primary competitors in the UAV camera market include HiSilicon, Intel, NVIDIA and Qualcomm. Certain of our customers and suppliers also have divisions that produce products competitive with ours.

Our ability to compete successfully depends on elements both within and outside of our control, including industry and general economic trends. Many of our competitors are substantially larger, have greater financial, technical, marketing, distribution, customer support and other resources, are more established than we are, and have significantly better brand recognition and broader product offerings which may enable them to develop and enable new technology into product solutions better or faster than us and to better withstand adverse economic or market conditions in the future.

Our ability to compete successfully in the rapidly evolving HD video market depends on several factors, including:

- the design and manufacturing of new solutions, including software, that anticipate the video processing and integration needs of our customers' next-generation products and applications;
- performance of our computer vision solutions, as measured by convolutional neural network performance, video and still picture image quality, resolution and frame processing rates;
- power consumption efficiency of our solutions;
- the ease of implementation of our products by customers;
- the strength of customer relationships;
- the selection of the foundry process technology and architecture tradeoffs to meet customers' product requirements in a timely manner;
- reputation and reliability;
- customer support; and
- the cost of the total solution.

We believe we compete favorably with respect to these factors, particularly because our solutions typically provide high-performance and low power consumption video, CNN performance, efficient integration of our advanced algorithms, exceptional storage and transmission efficiencies at lower power, highly-integrated SoC solutions based on a scalable platform, and comprehensive and flexible software. We cannot ensure, however, that our solutions will continue to compete favorably or that we will be successful in the face of increasing competition from new products introduced by existing or new competitors.

Intellectual Property

We rely on a combination of intellectual property rights, including patents, trade secrets, copyrights and trademarks, and contractual protections, to protect our core technology and intellectual property. As of January 31, 2019, we had 137 issued patents in the United States, 53 of which were continuation patents, six patents issued in Europe, five issued patents in China, six issued patents in Japan and 76 pending patent applications in the United States. The issued patents in the United States expire beginning in 2024 through 2035. Many of our issued patents and pending patent applications relate to image and video processing and HD video compression.

We may not receive competitive advantages from any rights granted under our patents, and our patent applications may not result in the issuance of any new patents. In addition, any patent we hold may be opposed, contested, circumvented, designed around by a third party or found to be unenforceable or invalidated. Others may develop technologies that are similar or superior to our proprietary technologies, duplicate our proprietary technologies or design around patents owned or licensed by us.

In addition to our own intellectual property, we also use third-party licenses for certain technologies embedded in our SoC solutions. These are typically non-exclusive contracts provided under royalty-accruing or paid-up licenses. These licenses are generally perpetual or automatically renewed for so long as we continue to pay any maintenance fees that may be due. To date, maintenance fees have not constituted a significant portion of our capital expenditures. While we do not believe our business is dependent to any significant degree on any individual third-party license, we expect to continue to use and may license additional third-party technology for our solutions.

We generally control access to and use of our confidential information through employing internal and external controls, including contractual protections with employees, contractors and customers. We rely in part on U.S. and international copyright laws to protect our mask work. All employees and consultants are required to execute confidentiality agreements in connection with their employment and consulting relationships with us. We also require them to agree to disclose and assign to us all inventions conceived or made in connection with the employment or consulting relationship.

Despite our efforts to protect our intellectual property, unauthorized parties may still copy or otherwise obtain and use our software, technology or other information that we regard as proprietary intellectual property. In addition, we continue to operate internationally, and effective patent, copyright, trademark and trade secret protection may not be available or may be limited in foreign countries.

Seasonality

Our business has tended to be seasonal with higher revenue in our third fiscal quarter as our customers typically increase their production to meet holiday shopping season or year-end demand for their products. Due to recent declines in demand for our solutions in several consumer camera markets, the seasonal impact was not significant in fiscal year 2019. We also may experience seasonally lower demand in our first fiscal quarter in the Asia-based portion of the IP security camera market as a result of industry seasonality and the impact of ODM and OEM factory closures associated with the Chinese New Year holiday.

Employees

At January 31, 2019, we employed a total of 750 people, including 165 in the United States, 531 in Asia, primarily in China and Taiwan and 54 in Europe. We also engage temporary employees and consultants. None of our employees are either represented by a labor union or subject to a collective bargaining agreement. We have not experienced any work stoppages, and we consider our relations with our employees to be good.

ITEM 1A. Risk Factors

Certain factors may have a material adverse effect on our business, financial condition and results of operations. You should consider carefully the risks and uncertainties described below, in addition to other information contained in this Annual Report on Form 10-K, including our consolidated financial statements and related notes. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties that we are unaware of, or that we currently believe are not material, may also become important factors that adversely affect our business. If any of the following risks actually occurs, our business, financial condition, results of operations, and future prospects could be materially and adversely affected. In that event, the trading price of our ordinary shares could decline, and you could lose part or all of your investment.

Risks Related to Our Business and Our Industry

If our customers do not design our solutions into their product offerings, or if our customers' product offerings are not commercially successful, our business would suffer.

We sell our video and image processing system-on-a-chip, or SoC, solutions to original equipment manufacturers, or OEMs, who include our SoCs in their products, and to original design manufacturers, or ODMs, who include our SoCs in the products that they supply to OEMs. We refer to ODMs as our customers and OEMs as our end customers, except as otherwise indicated or as the context otherwise requires. Our video and image processing SoCs are generally incorporated into our customers' products at the design stage, which is referred to as a design win. As a result, we rely on OEMs to design our solutions into the products that they design and sell. Without these design wins, our business would be significantly harmed. We often incur significant expenditures developing a new SoC solution without any assurance that any OEM will select our solution for design into its own product. Once an OEM designs a competitor's device into its product, it becomes significantly more difficult for us to sell our SoC solutions to that OEM because changing suppliers involves significant cost, time, effort and risk for the OEM.

Even if an OEM designs one of our SoC solutions into its product, we cannot be assured that the OEM's product will be commercially successful over time or at all. For example, in the past we have secured design wins for camera

products that were never commercially released by our customer as a result of factors beyond our control. If other products or other product categories incorporating our SoC solutions are not commercially successful or experience rapid decline, our revenue and business will suffer. For example, we have recently experienced declines in demand for our solutions in several consumer camera markets, including wearable cameras, virtual reality cameras and cameras incorporated into unmanned aerial vehicles, also referred to as UAVs or drones, which has negatively impacted our business.

Similarly, even if an OEM designs one of our SoC solutions into its product, we are not assured that we will receive or continue to receive new design wins from that OEM. For example, two of our largest OEMs in the consumer camera markets in the past few years, GoPro, Inc., or GoPro, and Dajiang Innovation Technology Inc., or DJI, have begun using competing solutions in their mainstream products, which has significantly reduced these OEMs' demand for our solutions and negatively impacted our revenue.

If we fail to penetrate new markets, our revenue and financial condition could be harmed.

In the past several years, a substantial portion of our revenue was generated from sales of our products to OEMs and ODMs of HD video cameras, including IP security cameras, wearable cameras and UAVs. Our revenue from several of these markets, however, has recently experienced significant declines. As a result, we believe that our future revenue growth, if any, will significantly depend on our ability to expand within the camera markets with our video and image processing SoC solutions, particularly in the professional IP security and home security and monitoring camera markets, as well as emerging markets such as the OEM automotive and robotics markets. Each of these markets presents distinct and substantial risks and, in many cases, requires us to develop new functionality or software to address the particular requirements of that market. For example, we expect that computer vision functionality will become an increasingly important requirement in many of our current and future markets, including the automotive, IP security camera and robotics markets. As a result, we believe that our ability to develop advanced computer vision technology and gain customer acceptance of our technology is critical to our future success and our efforts to develop such technology that gains market acceptance may not be successful. Development of products to address new markets, such as the OEM automotive and robotics markets, could negatively impact our ability to develop new products for our current markets, which may harm our financial condition, particularly in the near term. In addition, we anticipate that as we continue to move into new markets, such as the OEM automotive and robotics markets, we will likely face competition from larger competitors with greater resources and more history in these markets. If any of these markets do not develop as we currently anticipate or if we are unable to penetrate them successfully with our solutions, our revenue could decline and our financial condition will be negatively impacted.

Some of these markets are primarily served by only a few large, multinational OEMs with substantial negotiating power relative to us and, in some instances, with internal solutions that are competitive to our products. Meeting the technical requirements and securing design wins with any of these companies will require a substantial investment of our time and resources. We cannot assure that we will secure design wins from these or other companies or that we will achieve meaningful revenue from the sales of our solutions into these markets. If we fail to penetrate these or other new markets we are targeting, our financial condition would likely suffer.

Our target markets may not grow or develop as we currently expect and are subject to market risks, any of which could harm our business, revenue and operating results.

In the past few years, a substantial portion of our revenue has been derived from sales of our SoCs to the camera market, and in particular, the IP security camera market, automotive camera market, wearable camera market and UAV market. While we will continue to provide solutions addressing these markets, we are focusing our development resources on addressing computer vision applications, primarily in the professional IP security and home security and monitoring camera markets, the OEM automotive and robotics markets, with our computer vision solutions. The application of computer vision functionality in these markets is relatively new and we may be unable to predict the timing or development of these markets with accuracy. For example, a slower than expected adoption rate for computer vision technology in the IP security camera market could slow the demand for our new solutions. Similarly, a slower than anticipated adoption of electronic mirrors, advanced driving assistance systems and autonomous driving functionality could reduce demand for our new computer vision solutions. If our key target markets, such as automotive cameras, IP security cameras and cameras for robotic applications, do not grow or develop in ways that we currently expect, demand for our video and image processing SoCs may not materialize as expected and our business and operating results could suffer.

Global economic and political conditions, including possible trade tariffs and restrictions, may have an impact on our business and financial condition in ways that we currently cannot predict.

Recently proposed public policy changes and the imposition of trade tariffs and restrictions between the United States and China have, in our view, created and will continue to create an uncertain business environment. In particular, if additional tariffs or restrictions are imposed on our products or the products of our customers, there could be a negative impact on our operations and financial performance. For example, H.R. 5515 - John S. McCain National Defense Authorization Act for Fiscal Year 2019, which was recently enacted into law, will negatively impact our two largest China IP security customers and likely decrease their demand for our solutions. While we anticipate that this new law will likely have a negative impact on our revenue in the near term due to uncertainty relating to these customers, we cannot yet predict the longer term impact on our business. In addition, if further restrictions were placed on a significant customer affecting its ability to do business with us, it would likely have a material adverse effect on our business and financial condition. Similarly, changes in export classification requirements could impact our ability to supply our solutions to certain companies or in certain countries. Even in the absence of new restrictions, tariffs or changes in export classifications, it is possible that foreign customers could take actions to reduce dependence on the supply of components, including our solutions, that could be subject to new export classifications, which could have a material adverse effect on our business and financial condition.

Our customers may cancel their orders, change production quantities or delay production. If we fail to accurately forecast demand for our solutions, revenue shortfalls or excess, obsolete or insufficient inventory could result.

Our customers typically do not provide us with firm, long-term purchase commitments. Substantially all of our sales are made on a purchase order basis, which permits our customers to cancel, change or delay their product purchase commitments with little or no notice to us and often without penalty to them. Because production lead times often exceed the amount of time required by our customers to fill their orders, we often must build SoCs in advance of receiving orders from customers, relying on an imperfect demand forecast to project volumes and product mix.

Our SoCs are incorporated into products manufactured by or for our end customers, and as a result, demand for our solutions is influenced by the demand for our customers' products. Our ability to accurately forecast demand can be adversely affected by a number of factors, including inaccurate forecasting by our customers, miscalculations by our customers of their inventory requirements, changes in market conditions, adverse changes in our product order mix and fluctuating demand for our customers' products. For example, higher than normal customer inventory levels at GoPro significantly impacted our revenue in the first half of fiscal years 2017 and 2018. Higher than normal customer inventory levels can occur in the future. Even after an order is received, our customers may cancel these orders, request a decrease in production quantities or request a delay in the delivery of our solutions. Any such cancellation, decrease or delay subjects us to a number of risks, most notably that our projected sales will not materialize on schedule or at all, leading to unanticipated revenue shortfalls and excess or obsolete inventory that we may be unable to sell to other customers.

Alternatively, if we are unable to project customer requirements accurately, we may not build enough SoCs, which could lead to delays in product shipments and lost sales opportunities in the near term, as well as force our customers to identify alternative sources, which could affect our ongoing relationships with these customers. We have in the past had customers significantly increase their requested production quantities with little or no advance notice. If we do not fulfill customer demands in a timely manner, our customers may cancel their orders and we may be subject to customer claims for cost of replacement. In addition, the rapid pace of innovation in our industry could render portions of our inventory obsolete. Excess or obsolete inventory levels could result in unexpected expenses or increases in our reserves that could adversely affect our business, operating results and financial condition. In addition, any significant future cancellations or deferrals of product orders could harm our margins, increase our write-offs due to product obsolescence and restrict our ability to fund our operations.

We depend on a limited number of customers and end customers for a significant portion of our revenue. If we fail to retain or expand our customer relationships, our revenue could decline.

We derive a significant portion of our revenue from a limited number of ODMs who build products on behalf of a limited number of OEMs and from a limited number of OEMs to whom we ship directly. We anticipate that this customer concentration will continue for the foreseeable future. In fiscal year 2019, the customers representing 10% or more of revenue were Wintech Microelectronics Co., Ltd., or Wintech, the Company's distributor, and Chicony Electronics Co., Ltd., or Chicony, a direct ODM customer, which accounted for approximately 58% and 16% of total revenue, respectively. We believe that our operating results for the foreseeable future will continue to depend on sales to a relatively small number of customers and end-customers. In the future, these customers may decide not to purchase our SoC solutions at all, may purchase fewer solutions than they did in the past or may alter their purchasing patterns. As substantially all of our sales to date have been made on a purchase order basis, these customers may cancel, change or delay product purchase commitments with little or no notice to us and often without penalty and may make our revenue volatile from period to period. In the past, we have had significant customers decrease their demand for our solutions with little advance notice to us. For example, GoPro, our largest OEM customer in fiscal year 2017, has recently used a competing solution in its mainstream cameras, which had a significantly negative impact on our revenue. Similarly, our customer DJI recently introduced UAVs incorporating competing solutions that

have reduced, and will continue to reduce, DJI's demand for our solutions. The loss of a significant customer, or substantial reduction in purchases by a significant customer, could happen again at any time and without notice, and such loss would likely harm our financial condition and results of operations. Moreover, because several of our largest OEM customers have a dominant position in their markets, a loss of a significant customer may not be easily replaced through sales to other customers in that market.

In addition, our relationships with some customers may deter other potential customers who compete with these customers from buying our solutions. To attract new customers or retain existing customers, we may have to offer these customers favorable prices on our solutions. In that event, our average selling prices and gross margins would decline. The loss of a key customer, a reduction in sales to any key customer or our inability to attract new customers could seriously impact our revenue and harm our results of operations.

We do not have long-term supply contracts with our third-party manufacturing vendors, and they may not allocate sufficient capacity to us at reasonable prices to meet future demands for our solutions.

The semiconductor industry is subject to intense competitive pricing pressure from customers and competitors. Accordingly, any increase in the cost of our solutions, whether by adverse purchase price variances or adverse manufacturing cost variances, will reduce our gross margins and operating profit. We currently do not have long-term supply contracts with most of our primary third-party vendors, and we negotiate pricing with our main vendors on a purchase order-by-purchase order basis. Therefore, they are not obligated to perform services or supply product to us for any specific period, in any specific quantities, or at any specific price, except as may be provided in a particular purchase order. Availability of foundry capacity has in the recent past been limited due to strong demand. The ability of our foundry vendors to provide us with a product, which is sole sourced at each foundry, is limited by their available capacity, existing obligations and technological capabilities. Foundry capacity may not be available when we need it or at reasonable prices. None of our third-party foundry or assembly and test vendors has provided contractual assurances to us that adequate capacity will be available to us to meet our anticipated future demand for our solutions. Our foundry and assembly and test vendors may allocate capacity to the production of other companies' products while reducing deliveries to us on short notice. In particular, other companies that are larger and better financed than we are or that have long-term agreements with our foundry or assembly and test vendors may cause our foundry or assembly and test vendors to reallocate capacity to them, decreasing the capacity available to us. Converting or transferring manufacturing from a primary location or supplier to a backup provider could be expensive and would likely take at least two or more quarters. There are only a few foundries, including Samsung and Taiwan Semiconductor Manufacturing Co., Ltd., or TSMC, that are currently available for certain advanced process technologies that we utilize or may utilize, such as 10 or 7 nanometer, or nm. Accordingly, as we continue to develop solutions in advanced process nodes we will be increasingly dependent upon such foundries. The unavailability of one or both of these foundries could significantly impact our ability to produce our new products or delay production, which would negatively impact our business.

If, in the future, we enter into arrangements with suppliers that include additional fees to expedite delivery, nonrefundable deposits or loans in exchange for capacity commitments or commitments to purchase specified quantities over extended periods, such arrangements may be costly, reduce our financial flexibility and be on terms unfavorable to us, if we are able to secure such arrangements at all. Moreover, if we are able to secure foundry capacity, we may be obligated to use all of that capacity or incur penalties. These penalties could harm our financial results. To date, we have not entered into any such arrangements with our suppliers. If we need additional foundry or assembly and test subcontractors because of increased demand or the inability to obtain timely and adequate deliveries from our current vendors, we may not be able to do so cost-effectively, if at all.

If we fail to develop and introduce new or enhanced solutions on a timely basis, our ability to attract and retain customers could be impaired and our competitive position could be harmed.

We operate in a dynamic environment characterized by rapidly changing technologies and technological obsolescence. To compete successfully, we must design, develop, market and sell enhanced solutions that provide increasingly higher levels of performance and functionality and that meet the cost expectations of our customers. Our existing or future solutions could be rendered obsolete by the introduction of new products by our competitors; convergence of other markets with or into the camera market; the market adoption of products based on new or alternative technologies; the emergence of new industry standards for video compression; or the requirement of additional functionality included in video processors, such as analytics or computer vision functionality. In addition, the markets for our solutions are characterized by frequent introduction of next-generation and new products, short product life cycles, increasing demand for added functionality and significant price competition. If we or our customers are unable to manage product transitions in a timely and cost-effective manner, our business and results of operations would suffer.

Our failure to anticipate or timely develop new or enhanced solutions in response to technological shifts could result in decreased revenue and our competitors achieving design wins that we sought. In particular, we may experience difficulties with product design, development of new software, manufacturing, marketing or qualification that could delay or prevent our development, introduction or marketing of new or enhanced solutions. In addition, for some markets, such as the automotive OEM market, we expect that we will need to establish relationships with third-party suppliers or software providers in order to effectively market our solutions to end-customers. Failure to establish these relationships could harm our ability to achieve design wins. Delays in product development could impair our relationships with our customers and negatively impact sales of our solutions under development. Moreover, it is possible that our customers may develop their own product or adopt a competitor's solution for products that they currently buy from us. If we fail to introduce new or enhanced solutions that meet the needs of our customers or penetrate new markets in a timely fashion, we will lose market share and our operating results will be adversely affected.

Achieving design wins is subject to lengthy competitive selection processes that require us to incur significant costs. Even if we begin a product design, a customer may decide to cancel or change its product plans, resulting in no revenue from such expenditures.

We are focused on selling our video and image processing solutions to ODMs and OEMs for incorporation into their products at the design stage. These efforts to achieve design wins typically are lengthy, especially in emerging markets we intend to address such as the OEM automotive market, and in any case can require us to both incur design and development costs and dedicate scarce engineering resources in pursuit of a single customer opportunity. We may not prevail in the competitive selection process and, even when we do achieve a design win, we may never generate any revenue despite incurring development expenditures. For example, in the past we had achieved certain design wins and projected substantial future revenue as a result of such design wins. Subsequently, based on factors outside of our control, the applicable end customers abruptly cancelled the projects, with no notice to us, resulting in a loss of projected revenue. In addition, even if an OEM designs one of our SoC solutions into one of its products, we cannot be assured that we will secure new design wins from that OEM for future products. For example, GoPro and DJI have used competing solutions in recently introduced camera products, which has had a significant negative impact on our revenue.

These risks are exacerbated by the fact that some of our end customers' products, particularly in the camera market, likely will have short life cycles. Further, even after securing a design win, we have experienced and may again experience delays in generating revenue from our solutions as a result of the lengthy product development cycle typically required, if we generate any revenue at all as a result of any such design win.

Our customers generally take a considerable amount of time to evaluate our solutions. The typical time from early engagement by our sales force to actual product introduction runs from nine to 12 months, though it will likely take significantly longer in new markets such as the OEM automotive and robotics markets. The delays inherent in these lengthy sales cycles increase the risk that a customer will decide to cancel, curtail, reduce or delay its product plans, causing us to lose anticipated sales. In addition, any delay or cancellation of a customer's plans could harm our financial results, as we may have incurred significant expense and generated no revenue. Finally, our customers' failure to successfully market and sell their products could reduce demand for our SoC solutions and harm our business, financial condition and results of operations. If we were unable to generate revenue after incurring substantial expenses to develop any of our solutions, our business would suffer.

We expect competition to increase in the future, which could have an adverse effect on our revenue and market share.

The global semiconductor market in general, and the video and image processing markets in particular, are highly competitive. We compete in different target markets to various degrees on the basis of a number of competitive factors, including our solutions' performance, features, functionality, energy efficiency, size, ease with which our solution may be integrated into our customers' products, customer support, reliability and price, as well as on the basis of our reputation. We expect competition to increase and intensify as more and larger semiconductor companies enter our markets and as existing competitors improve or expand their product offerings. We also expect that the trend among large OEMs to seek to develop their own semiconductor solutions will continue and expand, particularly in camera markets experiencing consolidation, such as the IP security market. In addition, as we move into new markets, such as the OEM automotive and robotics markets, we will face competition from larger competitors with longer histories in these markets. Increased competition could result in price pressure, reduced profitability and loss of market share, any of which could harm our business, revenue and operating results.

Our competitors range from large, international companies offering a wide range of semiconductor products to smaller companies specializing in narrow markets. In the IP security camera market, our primary competitors include AMLogic Inc., Fullhan Microelectronics Co., Ltd., Geo Semiconductor, Inc., HiSilicon Technologies Co., Ltd., or

HiSilicon, which is owned by Huawei Technologies Co., Ingenic Semiconductor Co., Ltd., Intel Corporation, or Intel, Movidius Ltd., a subsidiary of Intel, Novatek Microelectronics Corp., or Novatek, OmniVision Technologies, Inc., or OmniVision, Qualcomm Incorporated, or Qualcomm, Realtek Semiconductor Corp., SigmaStar Technology Corp., or SigmaStar, Socionext Inc., or Socionext, an entity created from the merger of the system LSI businesses of Fujitsu Ltd. and Panasonic Corporation, or Panasonic, and Texas Instruments Incorporated, or Texas Instruments, as well as vertically integrated divisions of IP Security camera device OEMs, including Axis Communications AB and Sony Corporation, or Sony. In the automotive camera market, we currently compete against Allwinner Technology Co., Ltd., Alpha Imaging Technology Corp., Core Logic, Inc., Novatek, NXP Semiconductors N.V., OmniVision, Qualcomm, Renesas Electronics Corporation, SigmaStar, Sunplus Technology Co. Ltd., Texas Instruments and Xilinx Inc. In the wearable sports camera market, our primary competitors are vertically integrated divisions of camera device OEMs, including Sony, Panasonic, HiSilicon and Socionext. Our primary competitors in the UAV camera market include HiSilicon, Intel, NVIDIA and Qualcomm.

Certain of our customers and suppliers also have divisions that produce products competitive with ours and other customers may seek to vertically integrate competitive solutions in the future. In addition, certain third-party developers of technology competitive to our solutions have licensed their technology, including image signal processing and computer vision IP, which potentially enables a greater number of competitors to offer competitive solutions.

Our ability to compete successfully depends on elements both within and outside of our control, including industry and general economic trends. Many of our competitors are substantially larger, have greater financial, technical, marketing, distribution, customer support and other resources, are more established than we are and have significantly better brand recognition and broader product offerings than us, which may enable them to develop and enable new technology into product solutions better or faster than us and to better withstand adverse economic or market conditions in the future. Our ability to compete will depend on a number of factors, including:

- our ability to anticipate market and technology trends and successfully develop solutions that meet market needs;
- our success in identifying and penetrating new markets, applications and customers;
- our ability to understand the price points and performance metrics of competing products in the marketplace;
- our solutions' performance and cost-effectiveness relative to that of competing products;
- our ability to gain access to leading design tools and product specifications at the same time as our competitors;
- our ability to develop and maintain relationships with key OEMs and ODMs;
- our products' effective implementation of video processing standards;
- our ability to protect our intellectual property;
- our ability to expand international operations in a timely and cost-efficient manner;
- our ability to deliver products in volume on a timely basis at competitive prices;
- our ability to support our customers' incorporation of our solutions into their products; and
- our ability to recruit design and application engineers with expertise in image video and image processing technologies and sales and marketing personnel.

Our competitors may also establish cooperative relationships among themselves or with third parties or acquire companies that provide similar products to ours. As a result, new competitors or alliances may emerge that could acquire significant market share. Any of these factors, alone or in combination with others, could harm our business and result in a loss of market share and an increase in pricing pressure.

Fluctuations in our operating results on a quarterly and annual basis could cause the market price of our ordinary shares to decline.

Our revenue and operating results have fluctuated significantly from period to period in the past and are likely to do so in the future. In particular, our business has tended to be seasonal with higher revenue in our third quarter as our customers typically increase their production to meet holiday shopping season or year-end demand for their products. We also may experience seasonally lower demand in our first quarter in the Asia-based portion of the IP security camera market as a result of industry seasonality and the impact of ODM and OEM factory closures associated with the Chinese New Year holiday. As a result, you should not rely on period-to-period comparisons of our operating results as an indication of our future performance. In future periods, our revenue and results of operations may be below the expectations of analysts and investors, which could cause the market price of our ordinary shares to decline.

Factors that may affect our operating results include:

- fluctuations in demand, sales cycles, product mix, and prices for our products;
- the forecasting, scheduling, rescheduling or cancellation of orders by our customers;
- shifts in consumer or manufacturer preferences and any resultant change in demand for video and image capture devices into which our solutions are incorporated;
- changes in the competitive dynamics of our markets, including new entrants or pricing pressures;
- delays in our customers' ability to manufacture and ship products that incorporate our solutions caused by internal and external factors beyond our control;
- our ability to successfully define, design and release new solutions in a timely manner that meet our customers' needs;

- changes in manufacturing costs, including wafer, test and assembly costs, mask costs, manufacturing yields and product quality and reliability;
- timely availability of adequate manufacturing capacity from our manufacturing subcontractors;
- the timing of product announcements by our competitors or by us;
- incurrence of research and development and related new products expenditures;
- write-downs of inventory for excess quantities and technological obsolescence;
- future accounting pronouncements and changes in accounting policies;
- volatility in our share price, which may lead to higher stock-based compensation expense;
- volatility in our effective tax rate;
- general socioeconomic and political conditions in the countries where we operate or where our products are sold or used; and
- costs associated with litigation, especially related to intellectual property.

Moreover, the semiconductor industry has historically been cyclical in nature, reflecting overall economic conditions as well as budgeting and buying patterns of consumers. We expect these cyclical conditions to continue. As a result, our quarterly operating results are difficult to predict, even in the near term. Our expense levels are relatively fixed in the short term and are based, in part, on our expectations of future revenue. If revenue levels are below our expectations, we may experience material impacts on our business, including declines in margins and profitability, or incur losses. For example, in the first half of fiscal year 2017 and in the fourth quarter of fiscal year 2018, our revenue declined 21% and 19%, respectively, compared to the same periods in the prior fiscal years. For fiscal year 2019, our revenue declined 23% compared to fiscal year 2018 and we incurred our first annual net losses since our initial public offering, or IPO, in 2012. The reduced revenues resulted in a substantial decline in cash flows from operating activities. We may experience similar declines in the future, which would harm our operating results.

The average selling prices of video and image processing solutions in our target markets have historically decreased over time and will likely do so in the future, which could harm our revenue and gross margins.

Average selling prices of semiconductor products in the markets we serve have historically decreased over time, and we expect such declines to continue to occur for our solutions over time. Our gross margins and financial results will suffer if we are unable to offset reductions in our average selling prices by reducing our costs, developing new or enhanced SoC solutions on a timely basis with higher selling prices or gross margins, or increasing our sales volumes. Additionally, because we do not operate our own manufacturing, assembly or testing facilities, we may not be able to reduce our costs as rapidly as companies that operate their own facilities, and our costs may even increase, which could also reduce our gross margins. In the past, we have reduced the prices of our SoC solutions in anticipation of future competitive pricing pressures, new product introductions by us or our competitors and other factors. Recently, we have experienced competitive pricing pressures at the low ends of the automotive aftermarket camera market and China-based IP security camera market. We expect that we will have to address pricing pressures again in the future, particularly in markets experiencing consolidation, which could require us to reduce the prices of our SoC solutions and harm our operating results.

We are dependent on sales of a limited number of video and image processing solutions, and a decline in market adoption of these solutions could harm our business.

We currently derive substantially all of our revenue from the sale of our video and image processing SoCs for use in a relatively small number of camera markets and we expect to do so for the next several years. As a result, continued market adoption of our SoC solutions in these camera markets is critical to our future success. If demand for our SoC solutions were to decline, or demand for products incorporating our solutions declines, or does not grow as expected, our revenue would decline and our business would be harmed.

A substantial portion of our revenue is processed through a single distributor and the loss of this distributor may cause disruptions in our shipments, which may adversely affect our operations and financial condition.

We sell a significant percentage of our solutions through a single distributor, Wintech Microelectronics Co., Ltd., or Wintech, which serves as our non-exclusive sales representative in Asia, other than Japan. Approximately 58%, 59% and 60% of our revenue was derived from sales through Wintech for the fiscal years ended January 31, 2019, 2018 and 2017, respectively. We anticipate that a significant portion of our revenue will continue to be derived from sales through Wintech in the foreseeable future. Our current agreement with Wintech is effective until September 2019, unless it is terminated earlier by either party for any or no reason with 60 days written notice or by failure of the breaching party to cure a material breach within 30 days following written notice of such material breach by the non-breaching party. Our agreement with Wintech will automatically renew for additional successive 12-month terms unless at least 60 days before the end of the then-current term either party provides written notice to the other party that it elects not to renew the agreement. Termination of the relationship with Wintech, either by us or by Wintech, could result in a temporary or permanent loss of revenue. We may not be successful in finding suitable alternative distributors on satisfactory terms, or at all, and this could adversely affect our ability to effectively sell our solutions in certain geographical locations or to certain end customers. Furthermore, Wintech, or any successor or other distributors we do business with, may face issues obtaining credit, which could impair their ability to make timely payments to us.

We are subject to risks associated with our distributors' product inventories.

We sell many of our products to customers through distributors who maintain their own inventory of our products for sale to ODMs and end customers. We allow limited price adjustments on sales to distributors. Price adjustments may be effected by way of credits for future product or by cash payments to the distributor, either in arrears or in advance, using estimates based on historical transactions. Upon the adoption of ASC 606 on February 1, 2018, we recognize revenue on sales to distributors upon shipment and transfer of control (known as “sell-in” revenue recognition) based on the amount of consideration expected to be received. To the extent that the actual consideration received is materially different from estimated variable consideration recognized, we may be required to adjust revenue in subsequent periods.

If our distributors are unable to sell an adequate amount of their inventory of our products in a given quarter to ODMs and end customers, or if they decide to decrease their inventories for any reason, such as adverse global economic conditions or a downturn in technology spending, our sales to these distributors and our revenues may decline. We also face the risk that our distributors may purchase, or for other reasons accumulate, inventory levels of our products in any particular quarter in excess of future anticipated sales to end customers. If such sales do not occur in the time frame anticipated by these distributors for any reason, these distributors may substantially decrease the amount of product they order from us in subsequent periods until their inventory levels realign with end-customer demand, which would harm our business and could adversely affect our revenues in such subsequent periods. Our reserve estimates associated with products stocked by our distributors are based largely on reports that our distributors provide to us on a weekly or monthly basis. To date, we believe this resale and channel inventory data have been generally accurate. To the extent that these data are inaccurate or not received in a timely manner, we may not be able to make reserve estimates for future periods accurately or at all.

Deterioration of the financial conditions of our customers could adversely affect our operating results.

Deterioration of the financial condition of our distributors or customers could adversely impact our collection of accounts receivable. We regularly review the collectability and creditworthiness of our distributors and customers to determine an appropriate allowance for doubtful receivables. Based on our review of our distributors and customers, we currently have only immaterial reserves for uncollectible accounts. If our uncollectible accounts, however, were to

exceed our current or future allowance for doubtful receivables, our operating results would be negatively impacted.

The loss of any of our key personnel could seriously harm our business.

We believe our future success depends in large part upon the continuing services of the members of our senior management team and various engineering and other technical personnel. If one or more of our senior executives or other key personnel are unable or unwilling to continue in their present positions, we may not be able to replace them easily or at all, our business may be disrupted, and our financial condition and results of operations may be materially and adversely affected. In addition, if any member of our senior management team or any of our other key personnel joins a competitor or forms a competing company, we may experience material disruption of our operations and development plans and lose customers, know-how and key professionals and staff members, and we may incur increased operating expenses as the attention of other senior executives is diverted to recruit replacements for key personnel.

We rely on highly skilled personnel and, if we are unable to hire, retain or motivate key personnel, we may not be able to grow effectively.

Our performance largely depends on the talents and efforts of highly skilled individuals. Our future success depends on our continuing ability to identify, hire, develop, motivate, and retain highly skilled personnel for all areas of our organization. Our industry is characterized by high demand and intense competition for talent. The pool of qualified candidates is limited, particularly in Silicon Valley and parts of Asia for very-large-scale integration, or VLSI, and computer vision engineers, and certain of our competitors and potential competitors with greater resources have directly targeted our employees. In addition, our compensation arrangements, such as our equity award programs, may not always be successful in attracting new employees and retaining and motivating our existing employees. Our continued ability to compete effectively, and to grow our business, depends on our ability to attract new employees and to retain and motivate our existing employees.

If we do not generate revenue growth, we may not be able to execute our business plan and our operating results could suffer.

You should not rely on our revenue growth, gross margins or operating results for any prior quarterly or annual periods as an indication of our future operating performance. In the past, we experienced significant growth in a short period of time. Our revenue increased from $21.5 million in fiscal year 2008 to $316.4 million in fiscal year 2016. Recently, however, we have not sustained this growth rate. Our revenue decreased to $310.3 million in fiscal year 2017 and to $295.4 million in fiscal year 2018. Our revenue decreased to $227.8 million in fiscal year 2019, resulting in the first annual net losses since our IPO in 2012. We continue to invest in the development of new technology and solutions and expect our research and development expenditures to increase compared to prior periods. Accordingly, if we are unable to generate or maintain adequate revenue growth, our financial results could suffer and our stock price could decline.

If we are unable to manage any future growth, we may not be able to execute our business plan and our operating results could suffer.

Our business has grown rapidly in the past. Our future operating results depend to a large extent on our ability to successfully manage any expansion and growth, including the challenges of managing a company with an executive management team in the United States and the majority of its employees in Asia. We are increasing our investment in research and development and other functions to grow our business and address new markets, such as the OEM automotive and robotics markets. To manage our growth successfully and handle the responsibilities of being a public company, we believe we must effectively, among other things:

- recruit, hire, train and manage additional qualified engineers for our research and development activities, particularly in our offices in Asia and especially for the positions of semiconductor design and systems, applications engineering and computer vision development;
- add additional sales and business development personnel;
- add additional finance and accounting personnel;
- maintain and improve our administrative, financial and operational systems, procedures and controls; and
- enhance our information technology support for enterprise resource planning and design engineering by adapting and expanding our systems and tool capabilities, and properly training new hires as to their use.

We are likely to incur the costs associated with these increased investments earlier than some of the anticipated benefits, and the return on these investments, if any, may be lower, may develop more slowly than we expect or may not materialize. In addition, development of products to address emerging markets, such as the OEM automotive and robotics markets, could negatively impact our ability to develop new products for our current markets, which may

harm our financial condition, particularly in the near term.

If we are unable to manage growth effectively, we may not be able to take advantage of market opportunities or develop new solutions, and we may fail to satisfy customer product or support requirements, maintain product quality, execute our business plan or respond to competitive pressures.

While we intend to continue to invest in research and development, we may be unable to make the substantial investments that are required to remain competitive in our business.

The semiconductor industry requires substantial investment in research and development in order to bring to market new and enhanced solutions. Our research and development expense was $128.1 million, $115.5 million and $101.2 million in fiscal years 2019, 2018 and 2017, respectively. We expect to increase our research and development expenditures as compared to prior periods as part of our strategy of focusing on the development of innovative video and image processing solutions with increased functionality, such as computer vision capabilities, and as we target new markets, such as the automotive OEM and robotics markets. We are unable to predict whether we will have sufficient resources to maintain the level of investment in research and development required to remain competitive. For example, development in the latest process nodes, such as 10nm and 7nm, can cost significantly more than required to develop in larger process nodes, such as 28nm. This added cost could prevent us from being able to maintain a technology advantage over larger competitors that have significantly more resources to invest in research and development. In addition, we cannot assure you that the technologies which are the focus of our research and development expenditures will become commercially successful or generate any revenue.

We may have difficulty accurately predicting our future revenue and appropriately budgeting our expenses.

The rapidly evolving nature of the markets in which we sell our solutions, combined with substantial uncertainty concerning how these markets may develop and other factors beyond our control, limits our ability to accurately forecast quarterly or annual revenue. In addition, because we record a significant portion of our revenue from sales when we have received notification from our distributors that they have sold our products, some of the revenue we record in a quarter may be derived from sales of products shipped to our distributors during previous quarters. This revenue recognition methodology limits our ability to forecast quarterly or annual revenue accurately. We continue to expand our staffing and increase our expenditures in anticipation of future revenue growth. If our revenue does not increase as anticipated, we could incur significant losses due to our higher expense levels if we are not able to decrease our expenses in a timely manner to offset any shortfall in future revenue.

We may experience difficulties demonstrating the value to customers of newer, higher priced and higher margin solutions if they believe existing solutions are adequate to meet end customer expectations.

As we develop and introduce new solutions, we face the risk that customers may not value or be willing to bear the cost of incorporating these newer solutions into their products, particularly if they believe their customers are satisfied with current solutions. Regardless of the improved features or superior performance of the newer solutions, customers may be unwilling to adopt our new solutions due to design or pricing constraints. Owing to the extensive time and resources that we invest in developing new solutions, if we are unable to sell customers new generations of our solutions, or if we face pricing pressures on our new solutions, our revenue could decline and our business, financial condition, operating results and cash flows could be negatively affected.

The complexity of our solutions could result in unforeseen delays or expenses from undetected defects, errors or bugs in hardware or software which could reduce the market adoption of our new solutions, damage our reputation with current or prospective customers and adversely affect our operating costs.

Highly complex SoC solutions such as ours frequently contain defects, errors and bugs when they are first introduced or as new versions are released. We have in the past and may in the future experience these defects, errors and bugs. If any of our solutions have reliability, quality or compatibility problems, we may not be able to successfully correct these problems in a timely manner or at all. In addition, if any of our proprietary features contain defects, errors or bugs when first introduced or as new versions of our solutions are released, we may be unable to timely correct these problems. Consequently, our reputation may be damaged and customers may be reluctant to buy our solutions, which

could harm our ability to retain existing customers and attract new customers, and could adversely affect our financial results. In addition, these defects, errors or bugs could interrupt or delay sales to our customers. If any of these problems are not found until after we have commenced commercial production of a new product, we may incur significant additional development costs and product recall, repair or replacement costs. These problems may also result in claims against us by our customers or others.

Camera manufacturers incorporate components supplied by multiple third parties, and a supply shortage or delay in delivery of these components could delay orders for our solutions by our customers.

Our customers purchase components used in the manufacture of their cameras from various sources of supply, often involving several specialized components, including lenses, sensors, and memory chips. Any supply shortage or delay in delivery by third-party component suppliers, or a third-party supplier's cessation or shut down of its business, may prevent or delay production of our customers' products. In addition, replacement or substitute components may not be available on commercially reasonable terms, or at all. As a result of delays in delivery or supply shortages of third-party components, orders for our solutions may be delayed or canceled and our business may be harmed. For example, a disruption in the availability of image sensors from Sony Corporation as a result of the April 14, 2016 Kumamoto, Japan earthquake impacted our customers' ability to build or launch cameras and, as a result, negatively impacted the timing and scope of demand for our SoCs in the second and third quarters of fiscal year 2017. Similarly, our ability to generate design wins in some markets, such as the automotive OEM market, requires us to collaborate with third-party software suppliers in order to offer a complete solution to customers. Our inability to successfully collaborate with such third-party suppliers, or such suppliers' inability to develop and deliver software, could harm our ability to achieve design wins and harm our business. Errors or defects within a camera system or in the manner in which the various components interact could prevent or delay production of our customers' products, which could harm our business.

We outsource our wafer fabrication, assembly and testing operations to third parties, and if these parties fail to produce and deliver our products according to requested demands in specification, quantity, cost and time, our reputation, customer relationships and operating results could suffer.

We rely on third parties for substantially all of our manufacturing operations, including wafer fabrication, assembly and testing. Currently, the majority of our SoCs are supplied by Samsung in facilities located in Austin, Texas and South Korea, from whom we have the option to purchase both fully assembled and tested products as well as tested die in wafer form for assembly. Samsung subcontracts the assembly and initial testing of the assembled chips it supplies to us to Signetics Corporation and STATS ChipPAC Ltd. In the case of purchases of tested die from Samsung, we contract the assembly to Advanced Semiconductor Engineering, Inc., or ASE. We also have products supplied by Global UniChip Corporation, or GUC, in Taiwan, from whom we purchase fully assembled and tested products. The wafers used by GUC in the assembly of our products are manufactured by TSMC in Taiwan. The assembly is done by GUC subcontracted assembly suppliers ASE, and Powertech Technology Inc, or PTI. Final testing of all of our products is handled by King Yuan Electronics Co., Ltd. or Sigurd Corporation under the supervision of our engineers. We depend on these third parties to supply us with material of a requested quantity in a timely manner that meets our standards for yield, cost and manufacturing quality. We do not have any long-term supply agreements with any of our manufacturing suppliers. If one or more of these vendors terminates its relationship with us, or if we encounter any problems with our manufacturing supply chain, our ability to ship our solutions to our customers on time and in the quantity required would be adversely affected, which in turn could cause an unanticipated decline in our sales and damage our customer relationships.

If our foundry vendors do not achieve satisfactory yields or quality, our reputation and customer relationships could be harmed.

The fabrication of our video and image processing SoC solutions is a complex and technically demanding process. Minor deviations in the manufacturing process can cause substantial decreases in yields, and in some cases, cause production to be suspended. Our foundry vendors, from time to time, experience manufacturing defects and reduced manufacturing yields, including in the fabrication of our SoCs. Changes in manufacturing processes or the inadvertent use of defective or contaminated materials by our foundry vendors could result in lower than anticipated manufacturing yields or unacceptable performance of our SoCs. Many of these problems are difficult to detect at an

early stage of the manufacturing process and may be time consuming and expensive to correct. Poor yields from our foundry vendors, or defects, integration issues or other performance problems in our solutions, could cause us significant customer relations and business reputation problems, harm our financial results and give rise to financial or other damages to our customers. Our customers might consequently seek damages from us for their losses. A product liability claim brought against us, even if unsuccessful, would likely be time consuming and costly to defend.

Each of our SoC solutions is manufactured at a single location. If we experience manufacturing problems at a particular location, we would be required to transfer manufacturing to a new location or supplier. Converting or transferring manufacturing from a primary location or supplier to a backup fabrication facility could be expensive and could take two or more quarters. During such a transition, we would be required to meet customer demand from our then-existing inventory, as well as any partially finished goods that could be modified to the required product specifications. We do not seek to maintain sufficient inventory to address a lengthy transition period because we believe it is uneconomical to keep more than minimal inventory on hand. As a result, we may not be able to meet customer needs during such a transition, which could delay shipments, cause production delays, result in a decline in our sales and damage our customer relationships.

We may experience difficulties in transitioning to new wafer fabrication process technologies or in achieving higher levels of design integration, which may result in reduced manufacturing yields, delays in product deliveries and increased costs.

We aim to use the most advanced manufacturing process technology appropriate for our products that is available from our third-party foundries. As a result, we periodically evaluate the benefits of migrating our solutions to smaller geometry process technologies in order to improve performance and reduce costs. We believe this strategy will help us remain competitive. These ongoing efforts require us from time to time to modify the manufacturing processes for our products and to redesign some products, which in turn may result in delays in product deliveries. We may face difficulties, delays and increased expense as we transition our products to new processes, such as the 7nm process node, and potentially to new foundries. We depend on Samsung and TSMC, as the principal foundries for our products, to transition to new processes successfully. We cannot assure you that Samsung or TSMC will be able to effectively manage such transitions or that we will be able to maintain our relationship with Samsung or TSMC or develop relationships with new foundries. Moreover, as we utilize more advanced process nodes beyond 10nm, we are increasingly dependent upon Samsung and TSMC, who are the only foundries currently available for certain advanced process technologies. If we or our foundry vendors experience significant delays in transitioning to smaller geometries or fail to efficiently implement transitions, we could experience reduced manufacturing yields, delays in product deliveries and increased costs, all of which could harm our relationships with our customers and our operating results. As new processes become more prevalent, we expect to continue to integrate greater levels of functionality, as well as more end-customer and third-party intellectual property, into our solutions. We may not be able to achieve higher levels of design integration or deliver new integrated solutions on a timely basis.

We rely on third-party vendors to supply software development tools to us for the development of our new products, and we may be unable to obtain the tools necessary to develop or enhance new or existing products.

We rely on third-party software development tools to assist us in the design, simulation and verification of new products or product enhancements. To bring new products or product enhancements to market in a timely manner, or at all, we need software development tools that are sophisticated enough or technologically advanced enough to complete our design, simulations and verifications. In the future, the design requirements necessary to meet consumer demands for more features and greater functionality from our solutions may exceed the capabilities of available software development tools. Unavailability of software development tools may result in our missing design cycles or losing design wins, either of which could result in a loss of market share or negatively impact our operating results.

Because of the importance of software development tools to the development and enhancement of our solutions, our relationships with leaders in the computer-aided design industry, including Cadence Design Systems, Inc., Mentor Graphics Corporation and Synopsys, Inc., are critical to us. We have invested significant resources to develop relationships with these industry leaders. We believe that utilizing next-generation development tools to design, simulate and verify our products will help us remain at the forefront of the video compression market, and develop solutions that utilize leading-edge technology on a rapid basis. If these relationships are not successful, we may be unable to develop new products or product enhancements in a timely manner, which could result in a loss of market share, a decrease in revenue or negatively impact our operating results.

Our failure to adequately protect our intellectual property rights could impair our ability to compete effectively or defend ourselves from litigation, which could harm our business, financial condition and results of operations.

Our success depends, in part, on our ability to protect our intellectual property. We rely primarily on patent, copyright, trademark and trade secret laws, as well as confidentiality and non-disclosure agreements and other contractual protections, to protect our proprietary technologies and know-how, all of which offer only limited protection. The steps we have taken to protect our intellectual property rights may not be adequate to prevent misappropriation of our

proprietary information or infringement of our intellectual property rights, and our ability to prevent such misappropriation or infringement is uncertain, particularly in countries outside of the United States. The failure of our patents to adequately protect our technology might make it easier for our competitors to offer similar products or technologies, which would harm our business. For example, our patents and patent applications could be opposed, contested, circumvented, designed around by our competitors or be declared invalid or unenforceable in judicial or administrative proceedings. Our foreign patent protection is generally not as comprehensive as our U.S. patent protection and may not protect our intellectual property in some countries where our products are sold or may be sold in the future. Many U.S.-based companies have encountered substantial intellectual property infringement in foreign countries, including countries where we sell products. Even if foreign patents are granted, effective enforcement in foreign countries may not be available. For example, the legal environment relating to intellectual property protection in certain emerging market countries where we operate is relatively weaker, often making it difficult to create and enforce such rights. We may not be able to effectively protect our intellectual property rights in these emerging markets or elsewhere. If such an impermissible use of our intellectual property or trade secrets were to occur, our ability to sell our solutions at competitive prices may be adversely affected and our business, financial condition, operating results and cash flows could be materially and adversely affected.

The legal standards relating to the validity, enforceability and scope of protection of intellectual property rights are uncertain and evolving. We cannot assure you that others will not develop or patent similar or superior technologies, products or services, or that our patents, trademarks and other intellectual property will not be challenged, invalidated or circumvented by others.

Unauthorized copying or other misappropriation of our proprietary technologies could enable third parties to benefit from our technologies without paying us for doing so, which could harm our business. Monitoring unauthorized use of our intellectual property is difficult and costly. Although we are not aware of any unauthorized use of our intellectual property in the past, it is possible that unauthorized use of our intellectual property may have occurred or may occur without our knowledge. We cannot assure you that the steps we have taken will prevent unauthorized use of our intellectual property. Our failure to effectively protect our intellectual property could reduce the value of our technology in licensing arrangements or in cross-licensing negotiations.

We may in the future need to initiate infringement claims or litigation in order to try to protect our intellectual property rights. Litigation, whether we are a plaintiff or a defendant, can be expensive, time-consuming and may divert the efforts of our technical staff and management, which could harm our business, whether or not such litigation results in a determination favorable to us. Litigation also puts our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not being issued. Additionally, any enforcement of our patents or other intellectual property may provoke third parties to assert counterclaims against us. If we are unable to protect our proprietary rights or if third parties independently develop or gain access to our or similar technologies, our business, revenue, reputation and competitive position could be harmed.

Third parties' assertions of infringement of their intellectual property rights could result in our having to incur significant costs and cause our operating results to suffer.

The semiconductor industry is characterized by vigorous protection and pursuit of intellectual property rights and positions, which has resulted in protracted and expensive litigation for many companies. Certain of our customers have received, and we expect, particularly to the extent we gain greater market visibility, that in the future we may receive, communications from others alleging our infringement of their patents, trade secrets or other intellectual property rights. In addition, certain of our end customers have been the subject of lawsuits alleging infringement of intellectual property rights by products incorporating our solutions, including the assertion that the alleged infringement may be attributable, at least in part, to our technology. Lawsuits resulting from such allegations could subject us to significant liability for damages and invalidate our proprietary rights, though this has not occurred to date. Any potential intellectual property litigation also could force us to do one or more of the following:

- stop selling products or using technology that contain the allegedly infringing intellectual property;
- lose the opportunity to license our technology to others or to collect royalty payments based upon successful protection and assertion of our intellectual property against others;
- incur significant legal expenses;
- pay substantial damages to the party whose intellectual property rights we may be found to be infringing;
- redesign those products that contain the allegedly infringing intellectual property; or
- attempt to obtain a license to the relevant intellectual property from third parties, which may not be available on reasonable terms or at all.

Any significant impairment of our intellectual property rights from any litigation we face could harm our business and our ability to compete.

Any potential dispute involving our patents or other intellectual property could affect our customers, which could trigger our indemnification obligations to them and result in substantial expense to us.

In any potential dispute involving our patents or other intellectual property, our customers could also become the target of litigation. Certain of our customers have received notices from third parties claiming to have patent rights in certain technology and inviting our customers to license this technology, and certain of our end customers have been the subject of lawsuits alleging infringement of patents by products incorporating our solutions, including the assertion that the alleged infringement may be attributable, at least in part, to our technology. Because we generally indemnify our customers for intellectual property claims made against them for products incorporating our technology, any litigation could trigger technical support and indemnification obligations under some of our license agreements, which could result in substantial expense to us. Although we have not incurred significant indemnity expenses related to intellectual property claims to date, we anticipate that we will receive requests for indemnity in the future pursuant to our license agreements with our customers. In addition, other customers or end customers with whom we do not have formal agreements requiring us to indemnify them may ask us to indemnify them if a claim is made as a condition to awarding future design wins to us. Because some of our ODMs and OEMs are larger than we are and have greater resources than we do, they may be more likely to be the target of an infringement claim by third parties than we would be, which could increase our chances of becoming involved in a future lawsuit. Although we have not yet been subject to such claims, if any such claims were to succeed, we might be forced to pay damages on behalf of our ODMs or OEMs that could increase our expenses, disrupt our ability to sell our solutions and reduce our revenue. In addition to the time and expense required for us to supply support or indemnification to our customers, any such litigation could severely disrupt or shut down the business of our customers, which in turn could hurt our relations with our customers and cause the sale of our products to decrease.

We are subject to warranty and product liability claims and to product recalls.

From time to time, we are subject to warranty claims that may require us to make significant expenditures to defend these claims or pay damage awards. In the future, we may also be subject to product liability claims resulting from failure of our solutions or if products we design, manufacture, or sell, cause personal injury or property damage, even where the cause is unrelated to product defects. These risks will likely increase as our products are introduced into new devices, markets, or applications, including autonomous and semi-autonomous automotive, UAV and robotic applications. In the event of a warranty claim, we may also incur costs if we compensate the affected customer. We maintain product liability insurance, but this insurance is limited in amount and subject to significant deductibles. There is no guarantee that our insurance will be available or adequate to protect against all claims. We also may incur costs and expenses relating to a recall of one of our customers' products containing one of our devices. The process of identifying a recalled product in consumer devices that have been widely distributed may be lengthy and require significant resources, and we may incur significant replacement costs, contract damage claims from our customers and reputational harm. Costs or payments made in connection with warranty and product liability claims and product recalls could harm our financial condition and results of operations, as well as harm our reputation and cause the market value of our ordinary shares to decline.

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

Our security systems are designed to maintain the physical security of our facilities and information systems and protect our customers', suppliers' and employees' confidential information. Accidental or willful security breaches or other unauthorized access by third parties to our facilities or our information systems or the existence of computer viruses in our data or software could expose us to a risk of information loss and misappropriation of proprietary and confidential information. Security breaches, computer malware and computer hacking attacks have become more prevalent and sophisticated. Experienced computer programmers and hackers may be able to penetrate our security controls and misappropriate or compromise our confidential information or that of third parties or create system

disruptions. Computer programmers and hackers also may be able to develop and deploy viruses, worms and other malicious software programs that attack our information systems and cause disruptions of our business. Data security breaches may also result from non-technical means, for example, actions by an employee. Any theft or misuse of this information could result in, among other things, damage to our reputation, allegations by our customers that we have not performed our contractual obligations, litigation by affected parties and possible financial obligations for liabilities and damages related to the theft or misuse of this information, any of which could have a material adverse effect on our business, financial condition, our reputation, and our relationships with our customers and partners. We also rely on a number of third-party “cloud-based” service providers of corporate infrastructure services relating to, among other things, human resources, electronic communication services and some finance functions, and we are, of necessity, dependent on the security systems of these providers. Any security breaches or other unauthorized access by third parties to the systems of our cloud-based service providers or the existence of computer viruses in their data or software could expose us to a risk of information loss and misappropriation of confidential information. Since the techniques used to obtain unauthorized access or to sabotage systems change frequently and are often not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures.

We rely on third parties to provide services and technology necessary for the operation of our business. Any failure of one or more of our vendors, suppliers or licensors to provide such services or technology could harm our business.

We rely on third-party vendors to provide critical services, including, among other things, services related to accounting, human resources, information technology and network monitoring that we cannot or do not create or provide ourselves. We depend on these vendors to ensure that our corporate infrastructure will consistently meet our business requirements. The ability of these third-party vendors to successfully provide reliable and high-quality services is subject to technical and operational uncertainties that are beyond our control. While we may be entitled to damages if our vendors fail to perform under their agreements with us, our agreements with these vendors limit the amount of damages we may receive. In addition, we do not know whether we will be able to collect on any award of damages or that these damages would be sufficient to cover the actual costs we would incur as a result of any vendor's failure to perform under its agreement with us. Upon expiration or termination of any of our agreements with third-party vendors, we may not be able to replace the services provided to us in a timely manner or on terms and conditions, including service levels and cost, that are favorable to us, and a transition from one vendor to another vendor could subject us to operational delays and inefficiencies until the transition is complete.

Additionally, we incorporate third-party technology into some of our products, and we may do so in future products. The operation of our products could be impaired if errors occur in the third-party technology we use. It may be more difficult for us to correct any errors in a timely manner, if at all, because the development and maintenance of the technology is not within our control. We cannot assure you that these third parties will continue to make their technology, or improvements to the technology, available to us, or that they will continue to support and maintain their technology. Further, due to the limited number of vendors of some types of technology, it may be difficult to obtain new licenses or replace existing technology. Any impairment of the technology of or our relationship with these third parties could harm our business.

We are subject to governmental laws, regulations and other legal obligations related to privacy and data protection.

The legislative and regulatory framework for privacy and data protection issues worldwide is rapidly evolving and is likely to remain uncertain for the foreseeable future. We collect personally identifiable information, or PII, and other data as part of our business processes and activities. This data is subject to a variety of U.S. and international laws and regulations, including oversight by various regulatory or other governmental bodies. Many foreign countries and governmental bodies, including the European Union and other relevant jurisdictions where we conduct business, have laws and regulations concerning the collection and use of PII and other data obtained from their residents or by businesses operating within their jurisdictions that are currently more restrictive than those in the U.S. For example, effective May 2018, the European Union adopted the General Data Protection Regulation that imposed more stringent data protection requirements and provided for greater penalties for noncompliance. Any inability, or perceived inability, to adequately address privacy and data protection concerns, even if unfounded, or to comply with applicable laws, regulations, policies, industry standards, contractual obligations or other legal obligations, could result in additional cost and liability to us, damage our reputation and adversely affect our business.

Failure to comply with the U.S. Foreign Corrupt Practices Act, or FCPA, and similar laws associated with our activities outside of the United States could subject us to penalties and other adverse consequences.

We face significant risks if we fail to comply with the FCPA and other anti-corruption laws that prohibit improper payments or offers of payment to foreign governments and political parties by us for the purpose of obtaining or retaining business. In many foreign countries, particularly in countries with developing economies, it may be a local custom that businesses operating in such countries engage in business practices that are prohibited by the FCPA or other applicable laws and regulations. Although we implemented an FCPA compliance program, we cannot assure you that all of our employees and agents, as well as those companies to which we outsource certain of our business

operations, will not take actions in violation of our policies and applicable law, for which we may be ultimately held responsible. Any violation of the FCPA or other applicable anti-corruption laws could result in severe criminal or civil sanctions and, in the case of the FCPA, suspension or debarment from U.S. government contracting, which could have a material and adverse effect on our reputation, business, financial condition, operating results and cash flows.

We, our customers and third-party contractors are subject to increasingly complex environmental regulations and compliance with these regulations may delay or interrupt our operations and adversely affect our business.

We face increasing complexity in our procurement, design, and research and development operations as a result of requirements relating to the materials composition of our products, including the European Union's, or EU's, Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, or RoHS, directive, which restricts the content of lead and certain other hazardous substances in specified electronic products put on the market in the EU and similar Chinese legislation relating to marking of electronic products which became effective in March 2007. Failure to comply with these and similar laws and regulations could subject us to fines, penalties, civil or criminal sanctions, contract damage claims, and take-back of non-compliant products, which could harm our business, reputation and operating results. The passage of similar requirements in additional jurisdictions or the tightening of these standards in jurisdictions where our products are already subject to such requirements could cause us to incur significant expenditures to make our products compliant with new requirements, or could limit the markets into which we may sell our products.

Some of our operations, as well as the operations of our contract manufacturers and foundry vendors and other suppliers, are also regulated under various other federal, state, local, foreign and international environmental laws and requirements, including those governing, among other matters, the management, disposal, handling, use, labeling of, and exposure to hazardous substances, and the discharge of pollutants into the air and water. Liability under environmental laws can be joint and several and without regard to comparative fault. We cannot assure you that violations of these laws will not occur in the future, as a result of human error, accident, equipment failure or other causes. Environmental laws and regulations have increasingly become more stringent over time. We expect that our products and operations will be affected by new environmental requirements on an ongoing basis, which will likely result in additional costs, which could adversely affect our business.

Our failure to comply with present and future environmental, health and safety laws could cause us to incur substantial costs, result in civil or criminal fines and penalties and decreased revenue, which could adversely affect our operating results. Failure by our foundry vendors or other suppliers to comply with applicable environmental laws and requirements could cause disruptions and delays in our product shipments, which could adversely affect our relations with our ODMs and OEMs and adversely affect our business and results of operations.

Regulations related to "conflict minerals" may force us to incur additional expenses, may make our supply chain more complex and may result in damage to our reputation with customers.

Pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, or the Dodd-Frank Act, the Securities and Exchange Commission, or the SEC, has adopted requirements for companies that use certain minerals and metals, known as conflict minerals, in their products, whether or not these products are manufactured by third parties. These requirements require companies to perform due diligence, disclose and report whether or not such minerals originate from the Democratic Republic of Congo and adjoining countries. These requirements could adversely affect the sourcing, availability and pricing of minerals used in the manufacture of semiconductor devices, including our products. While these requirements continue to be subject to administrative uncertainty, we have incurred, and may continue to incur, costs to comply with the disclosure requirements, including costs related to determining the source of any of the relevant minerals and metals used in our products. Since our supply chain is complex, we may not be able to sufficiently verify the origins for these minerals and metals used in our products through the due diligence procedures that we implement, which may harm our reputation. In such event, we may also face difficulties in satisfying customers who require that all of the components of our products are certified as conflict mineral free.

Rapidly changing industry standards could make our video and image processing solutions obsolete, which would cause our operating results to suffer.

We design our video and image processing solutions to conform to video compression standards, including MPEG-2, H.264 and H.265, set by industry standards setting bodies such as ITU-T Video Coding Experts Group and the ISO/IEC Moving Picture Experts Group. Generally, our solutions comprise only a part of a camera device. All components of these devices must uniformly comply with industry standards in order to operate efficiently together. We depend on companies that provide other components of the devices to support prevailing industry standards. Many of these companies are significantly larger and more influential in driving industry standards than we are. Some industry standards may not be widely adopted or implemented uniformly, and competing standards may emerge that may be preferred by our customers or by consumers. If our customers or the suppliers that provide other device components adopt new or competing industry standards with which our solutions are not compatible, or if the industry groups fail to adopt standards with which our solutions are compatible, our existing solutions would become less desirable to our customers. As a result, our sales would suffer, and we could be required to make significant expenditures to develop new SoC solutions. For example, if the new H.265 video compression standard is not broadly adopted by our customers or potential customers, sales of our H.265 compliant solutions would suffer and we may be required to expend substantial resources to comply with an alternative video compression standard. In addition, existing standards may be challenged as infringing upon the intellectual property rights of other companies or may be superseded by new innovations or standards.

Products for communications applications are based on industry standards that are continually evolving. Our ability to compete in the future will depend on our ability to identify and ensure compliance with these evolving industry standards, including any new video compression standards. The emergence of new industry standards could render our solutions incompatible with products developed by other suppliers. As a result, we could be required to invest significant time and effort and to incur significant expense to redesign our solutions to ensure compliance with relevant standards. If our solutions are not in compliance with prevailing industry standards for a significant period of time, we could miss opportunities to achieve crucial design wins, which could harm our business.

We are subject to the cyclical nature of the semiconductor industry.

The semiconductor industry is highly cyclical and is characterized by constant and rapid technological change, rapid product obsolescence, price erosion, evolving standards, short product life cycles and wide fluctuations in product supply and demand. The industry experienced a significant downturn during the recent global recession. These downturns have been characterized by diminished product demand, production overcapacity, high inventory levels and accelerated erosion of average selling prices. Any future downturns could harm our business and operating results. Furthermore, any significant upturn in the semiconductor industry could result in increased competition for access to third-party foundry and assembly capacity. We are dependent on the availability of this capacity to manufacture and assemble our SoC solutions. None of our third-party foundry or assembly contractors has provided assurances that adequate capacity will be available to us in the future.

The use of open source software in our products, processes and technology may expose us to additional risks and compromise our proprietary intellectual property.

Our products, processes and technology sometimes utilize and incorporate software that is subject to an open source license. Open source software is typically freely accessible, usable and modifiable. Certain open source software licenses, such as the GNU General Public License, require a user who intends to distribute the open source software as a component of the user's software to disclose publicly part or all of the source code to the user's software. In addition, certain open source software licenses require the user of such software to make any derivative works of the open source code available to others on terms unfavorable to us or at no cost. This can subject previously proprietary

software to open source license terms.

While we monitor the use of open source software in our products, processes and technology and try to ensure that no open source software is used in such a way as to require us to disclose the source code to the related product, processes or technology when we do not wish to do so, such use could inadvertently occur. Additionally, if a third-party software provider has incorporated certain types of open source software into software we license from such third-party for our products, processes or technology, we could, under certain circumstances, be required to disclose the source code to our products, processes or technology. This could harm our intellectual property position and our business, results of operations and financial condition.

Some of our operations and a significant portion of our customers and our subcontractors are located outside of the United States, which subjects us to additional risks, including increased complexity and costs of managing international operations and geopolitical instability.

We have research and development design centers and business development offices in China, Japan, Italy, South Korea and Taiwan, and we expect to continue to conduct business with companies that are located outside the United States, particularly in Asia. We purchase wafers from foreign foundries, have our solutions assembled and tested by subcontractors located in Asia, and supply our solutions to customers located outside of the United States. Even customers of ours that are based in the United States often use contract manufacturers based in Asia to manufacture their products, and these contract manufacturers typically purchase products directly from us. As a result of our international focus, we face numerous challenges and risks, including:

- increased complexity and costs of managing international operations;
- longer and more difficult collection of receivables;
- difficulties in enforcing contracts generally;
- regional economic instability;
- geopolitical instability and military conflicts;
- limited protection of our intellectual property and other assets;
- compliance with local laws and regulations and unanticipated changes in local laws and regulations, including tax laws and regulations;
- trade and foreign exchange restrictions and higher tariffs;
- travel restrictions;
- timing and availability of import and export licenses and other governmental approvals, permits and licenses, including export classification requirements;
- foreign currency exchange fluctuations relating to our international operating activities;
- restrictions imposed by the U.S. government on our ability to do business with certain companies or in certain countries as a result of international political conflicts;
- transportation delays and other consequences of limited local infrastructure, and disruptions, such as large scale outages or interruptions of service from utilities or telecommunications providers;
- difficulties in staffing international operations;
- heightened risk of terrorist acts;
- local business and cultural factors that differ from standards and practices in the U.S.;
- differing employment practices and labor relations;
- regional health issues and natural disasters; and
- work stoppages.

Our third-party contractors and their suppliers are concentrated in South Korea, Taiwan and Japan, a region subject to earthquakes and other natural disasters. Any disruption to the operations of these contractors could cause significant delays in the production or shipment of our products.

The majority of our products are manufactured by or receive components from third-party contractors located in South Korea, Taiwan and Japan. The risk of an earthquake or tsunami in South Korea, Taiwan, Japan and elsewhere in the Pacific Rim region is significant due to the proximity of major earthquake fault lines. For example, in December 2006 a major earthquake occurred in Taiwan and in March 2011 a major earthquake and tsunami occurred in Japan. Although we are not aware of any significant damage suffered by our third-party contractors as a result of those natural disasters, the occurrence of additional earthquakes or other natural disasters could result in the disruption of our foundry vendor or assembly and test capacity. A disruption in the availability of image sensors from Sony Corporation as a result of the April 14, 2016 Kumamoto, Japan earthquake impacted our customers' ability to build or launch cameras and, as a result, negatively impacted the timing and scope of demand for our SoCs in fiscal year 2017. Any disruption resulting from such events could cause significant delays in the production or shipment of our products until we are able to shift our manufacturing, assembling or testing from the affected contractor to another third-party vendor. We may not be able to obtain alternate capacity on favorable terms, or at all.

If our operations are interrupted, our business and reputation could suffer.

Our operations and those of our manufacturers are vulnerable to interruption caused by technical breakdowns, computer hardware and software malfunctions, software viruses, infrastructure failures, fires, earthquakes, floods, power losses, telecommunications failures, terrorist attacks, wars, Internet failures and other events beyond our control. Any disruption in our services or operations could result in a reduction in revenue or a claim for substantial damages against us, regardless of whether we are responsible for that failure. We rely on our computer equipment, database storage facilities and other office equipment, which are located primarily in the seismically active San Francisco Bay Area and Taiwan. If we suffer a significant database or network facility outage, our business could experience disruption until we fully implement our back-up systems.

We are subject to regulatory compliance requirements, including Section 404 of the Sarbanes-Oxley Act of 2002, which are costly to comply with, and our failure to comply with these requirements could harm our business and operating results.

We are subject to disclosure and compliance requirements associated with being a public company, including but not limited to compliance with Section 404 of the Sarbanes-Oxley Act of 2002. For example, Section 404 of the Sarbanes-Oxley Act requires that our management report on, and our independent auditors attest to, the effectiveness of our internal control structure and procedures for financial reporting. Compliance with Section 404 requires a significant amount of time, expenses and diversion of internal resources. If we or our auditors discover a material weakness in our internal controls, the disclosure of that fact, even if quickly remedied, could reduce the market's confidence in our financial statements and harm our stock price. In addition, if we fail to maintain effective controls over financial reporting, we could be subject to sanctions or investigations by The NASDAQ Stock Market, the SEC, or other regulatory authorities. Furthermore, investor perceptions of our company may suffer, and this could cause a decline in the market price of our ordinary shares. Any inability to provide reliable financial reports or prevent fraud could harm our business. We may not be able to effectively and timely implement necessary control changes and employee training to ensure continued compliance with the Sarbanes-Oxley Act and other regulatory and reporting requirements. We cannot assure you that in the future we will be able to continue to fully comply with the requirements of the Sarbanes-Oxley Act or that management or our auditors will conclude that our internal controls are effective in future periods. Irrespective of compliance with Section 404, any failure of our internal controls could have a material adverse effect on our stated results of operations and harm our reputation.

Changes to financial accounting standards may affect our results of operations and could cause us to change our business practices.

We prepare our consolidated financial statements to conform to generally accepted accounting principles, or GAAP, in the United States. These accounting principles are subject to interpretation by the American Institute of Certified Public Accountants, the SEC and various bodies formed to interpret and create accounting rules and regulations. Changes in those accounting rules, including the new revenue recognition guidance and the associated adoption efforts, which are currently underway, could have a significant effect on our financial results, require significant resources, pose challenges in forecasting revenue and may affect our reporting of transactions completed before a change is announced. Changes to those rules or the questioning of current practices may adversely affect our reported financial results or the way we conduct our business.

Upon the adoption of ASC 606 on February 1, 2018, we recognize revenue on sales to distributors upon shipment and transfer of control (known as “sell-in” revenue recognition) based on the amount of consideration expected to be received. To the extent that the actual consideration received is materially different from estimated variable consideration recognized, we may be required to adjust revenue in subsequent periods.

The complexity of calculating our tax provision may result in errors that could result in restatements of our financial statements.

We are incorporated in the Cayman Islands and our operations are subject to income and transaction taxes in the United States, China, Hong Kong, Japan, Italy, South Korea, Taiwan and other jurisdictions in which we do business. Due to the complexity associated with the calculation of our tax provision, we have hired independent tax advisors to assist us. If we or our independent tax advisors fail to resolve or fully understand certain issues, there may be errors that could result in us having to restate our financial statements. Restatements are generally costly and could adversely impact our results of operations or have a negative impact on the trading price of our ordinary shares.

Changes in effective tax rates or adverse outcomes resulting from examination of our income tax returns could adversely affect our results.

Our future effective tax rates could be adversely affected if our earnings are lower than anticipated in countries where we have lower statutory rates and higher than anticipated in countries where we have higher statutory rates, by changes in the valuation of our deferred tax assets and liabilities, tax effects of share-based compensation, or by changes in tax laws, regulations, accounting principles or interpretations thereof. For example, changes in tax laws, including the U.S. federal tax legislation commonly referred to as the Tax Cuts and Jobs Act of 2017 (Tax Act), as well as other factors, could cause us to experience fluctuations in our tax obligations and effective tax rates and otherwise adversely affect our tax positions and/or our tax liabilities.

The Tax Act requires complex computations not previously provided in U.S. tax law. The U.S. Department of Treasury has broad authority to issue regulations and interpretative guidance that may significantly impact how we will apply the law and impact our results of operations in the period issued. As such, the application of accounting guidance for such items is currently uncertain. Further, compliance with the Tax Act and the accounting for such provisions require accumulation of information not previously required or regularly produced. While we have completed our accounting for the effects of the Tax Act, additional regulatory guidance may still be issued by the applicable taxing authorities which could materially affect our tax obligations and effective tax rate.

In addition, our income tax returns are subject to continuous examination by the Internal Revenue Service, or IRS, and other tax authorities. We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. We cannot assure you that the outcomes from these continuous examinations will not have an adverse effect on our operating results and financial condition.

Unfavorable tax law changes, an unfavorable governmental review of our tax returns, changes in our geographical earnings mix or imposition of withholding taxes on repatriated earnings could adversely affect our effective tax rate and our operating results.

Our operations are subject to certain taxes, such as income and transaction taxes, in the Cayman Islands, the United States, China, Hong Kong, Japan, Italy, South Korea, Taiwan and other jurisdictions in which we do business. A change in the tax laws in the jurisdictions in which we do business, including an increase in tax rates or an adverse change in the treatment of an item of income or expense, possibly with retroactive effect, could result in a material increase in the amount of taxes we incur. In particular, past proposals have been made to change certain U.S. tax laws relating to foreign entities with U.S. connections, which may include us. For example, previously proposed legislation has considered treating certain foreign corporations as U.S. domestic corporations (and therefore taxable on all of their worldwide income) if the management and control of the foreign corporation occurs, directly or indirectly, primarily within the United States. If such legislation were enacted, we could, depending on the precise form, be subject to U.S. taxation notwithstanding our domicile outside the United States. In addition, on October 5, 2015 the Organization for Economic Co-operation and Development, or OECD, which represents a coalition of member countries, released its

final reports from the BEPS Action Plans. The final reports include recommendations covering a number of issues, including country-by-country reporting, permanent establishment rules, transfer pricing rules and tax treaties. These changes, which have been or are in the process of being adopted by numerous countries, could increase uncertainties and may adversely affect our provision for income taxes.

We are subject to periodic audits or other reviews by tax authorities in the jurisdictions in which we conduct our activities. Any such audit, examination or review requires management's time, diverts internal resources and, in the event of an unfavorable outcome, may result in additional tax liabilities or other adjustments to our historical results.

Because we conduct operations in multiple jurisdictions, our effective tax rate is influenced by the amounts of income and expense attributed to each such jurisdiction. If such amounts were to change so as to increase the amounts of our net income subject to taxation in higher-tax jurisdictions, or if we were to commence operations in jurisdictions assessing relatively higher tax rates, our effective tax rate could be adversely affected. In addition, we may determine that it is advisable from time to time to repatriate earnings from subsidiaries under circumstances that could give rise to imposition of potentially significant withholding taxes by the jurisdictions in which such amounts were earned, without our receiving the benefit of any offsetting tax credits, which could also adversely impact our effective tax rate.

We may be classified as a passive foreign investment company which could result in adverse U.S. federal income tax consequences for U.S. holders of our ordinary shares.

Based on the current and anticipated valuation of our assets and the composition of our income and assets, we do not expect to be considered a passive foreign investment company, or PFIC, for U.S. federal income tax purposes for our 2019 fiscal year or the foreseeable future. However, a separate determination must be made at the close of each taxable year as to whether we are a PFIC for that taxable year, and we cannot assure you that we will not be a PFIC for our 2020 fiscal year or any future taxable year. Under current law, a non-U.S. corporation will be considered a PFIC for any taxable year if either (a) at least 75% of its gross income is passive income or (b) at least 50% of the value of its assets, generally based on an average of the quarterly values of the assets during a taxable year, is attributable to assets that produce or are held for the production of passive income. PFIC status depends on the composition of our assets and income and the value of our assets (which may be based in part on the value of our ordinary shares which may fluctuate), including, among others, a pro rata portion of the income and assets of each subsidiary in which we own, directly or indirectly, at least 25% by value of the subsidiary's equity interests, from time to time. Because we currently hold, and expect to continue to hold, a substantial amount of cash or cash equivalents, and because the calculation of the value of our assets may be based in part on the value of our ordinary shares which may fluctuate and may fluctuate considerably given that market prices of technology companies historically often have been volatile, we may be a PFIC for any taxable year. If we were treated as a PFIC for any taxable year during which a U.S. holder held ordinary shares, certain adverse U.S. federal income tax consequences could apply for such U.S. holder.

Changes in our United States federal income tax classification, or that of our subsidiaries, could result in adverse tax consequences to our 10% or greater U.S. shareholders.

The Tax Act signed on December 22, 2017 may have changed the consequences to U.S. shareholders that own, or are considered to own, as a result of the attribution rules, ten percent or more of the voting power or value of the stock of a non-U.S. corporation (a 10% U.S. shareholder) under the U.S. Federal income tax law applicable to owners of U.S. controlled foreign corporations, or CFCs.

Prior to the Tax Act, we did not believe that we, or any of our non-U.S. subsidiaries, were considered a CFC, which is a determination made daily based on whether the 10% U.S. shareholders together own, or are considered to own as a result of the attribution rules, more than fifty percent of the voting power or value of a non-U.S. corporation. The Tax Act repealed Internal Revenue Code Section 958(b)(4), which, unless clarified in future regulations or other guidance, may result in classification of certain of the Company's foreign subsidiaries as CFCs with respect to any single 10% U.S. shareholder. This may be the result without regard to whether 10% U.S. shareholders together own, directly or indirectly, more than fifty percent of the voting power or value of the Company as was the case under prior rules. The repeal is effective as of the last taxable year of CFCs beginning before January 1, 2018 and for the taxable year of 10% U.S. shareholders in which the CFCs' taxable year ends.

Fluctuations in exchange rates between and among the currencies of the countries in which we do business may adversely affect our operating results.

Our sales have been historically denominated in U.S. dollars. An increase in the value of the U.S. dollar relative to the currencies of the countries in which our end customers operate could impair the ability of our end customers to cost-effectively integrate our SoCs into their devices which may materially affect the demand for our solutions and cause these end customers to reduce their orders, which would adversely affect our revenue and business. We may experience foreign exchange gains or losses due to the volatility of other currencies compared to the U.S. dollar. A significant portion of our solutions are sold to camera manufacturers located outside the United States, primarily in Asia. Sales to customers in Asia accounted for approximately 87%, 79% and 73% of our total revenue in fiscal years

2019, 2018 and 2017, respectively. Because most of our end customers or their ODM manufacturers are located in Asia, we anticipate that a majority of our future revenue will continue to come from sales to that region. Although a large percentage of our sales are made to customers in Asia, we believe that a significant number of the products designed by these customers and incorporating our SoCs are then sold to consumers globally. In addition, if in the future we sell products or purchase inventory in currencies other than the U.S. dollar, our exposure to foreign currency risk could become more significant.

A significant number of our employees are located in Asia, principally Taiwan and China. Therefore, a portion of our payroll as well as certain other operating expenses are paid in currencies other than the U.S. dollar, such as the New Taiwan Dollar and the Chinese Yuan Renminbi. Our operating results are denominated in U.S. dollars and the difference in exchange rates in one period compared to another may directly impact period-to-period comparisons of our operating results. Furthermore, currency exchange rates, particularly the exchange rates between the Chinese Yuan Renminbi and the U.S. dollar and between the New Taiwan Dollar and the U.S. dollar, have been especially volatile in the recent past and these currency fluctuations may make it difficult for us to predict our operating results.

We have not implemented any hedging strategies to mitigate risks related to the impact of fluctuations in currency exchange rates. Even if we were to implement hedging strategies, not every exposure can be hedged and, where hedges are put in place based on expected foreign exchange exposure, they are based on forecasts which may vary or which may later prove to have been inaccurate. Failure to hedge successfully or anticipate currency risks accurately could adversely affect our operating results.

We may make acquisitions in the future that could disrupt our business, cause dilution to our shareholders, reduce our financial resources and harm our business.

In the future, we may acquire other businesses, products or technologies. Other than our acquisition of VisLab S.r.l., or VisLab, in June 2015, we have not made any acquisitions to date and do not have any agreements or commitments for any specific acquisition at this time. Our ability to make and successfully integrate acquisitions is unproven. Our acquisition of VisLab and any future acquisitions may not strengthen our competitive position and may be viewed negatively by our customers, financial markets or investors, and we may not achieve our goals in a timely manner, or at all. In addition, any acquisitions we make could lead to difficulties in integrating personnel, technologies and operations from the acquired businesses and in retaining and motivating key personnel from these businesses. Acquisitions may disrupt our ongoing operations, divert management from their primary responsibilities, subject us to additional liabilities, increase our expenses and adversely impact our business, operating results, financial condition and cash flows. Acquisitions may also reduce our cash available for operations and other uses, and could also result in an increase in amortization expense related to identifiable assets acquired, potentially dilutive issuances of equity securities or the incurrence of debt, any of which could harm our business.

We cannot predict our future capital needs, and we may not be able to obtain additional financing to fund our operations.

We may need to raise additional funds in the future. Any required additional financing may not be available on terms acceptable to us, or at all. If we raise additional funds by issuing equity securities or convertible debt, investors may experience significant dilution of their ownership interest, and the newly-issued securities may have rights senior to those of the holders of our ordinary shares. If we raise additional funds by obtaining loans from third parties, the terms of those financing arrangements may include negative covenants or other restrictions on our business that could impair our operational flexibility and would also require us to incur interest expense. If additional financing is not available when required or is not available on acceptable terms, we may have to scale back our operations or limit our production activities, and we may not be able to expand our business, develop or enhance our products, take advantage of business opportunities or respond to competitive pressures which could result in lower revenue and reduce the competitiveness of our products.

Our marketable securities portfolio could experience a decline in market value, which could materially and adversely affect our financial results.

In fiscal year 2019, we added an additional $100.0 million of capital in debt security investments. As of January 31, 2019, these securities had approximately $205.1 million in value. The investments consisted primarily of money market funds, certificates of deposit, commercial paper, asset-backed securities, U.S. government securities and debt securities of corporations which are focused on the preservation of our capital. We currently do not use derivative financial instruments to adjust our investment portfolio risk or income profile. These investments, as well as any cash deposited in bank accounts, are subject to general credit, liquidity, market and interest rate risks, which may be exacerbated by unusual events, such as the Eurozone crisis and the U.S. debt ceiling crisis, which affected various sectors of the financial markets and led to global credit and liquidity issues. If the global credit market continues to experience volatility or deteriorates, our investment portfolio may be impacted and some or all of our investments may experience other-than-temporary impairment which could adversely impact our financial results and position.

Risks Related to Ownership of Our Ordinary Shares

The market price of our ordinary shares may be volatile, which could cause the value of your investment to decline.

Since our initial public offering in October 2012, the market price of our ordinary shares has been highly volatile. The trading price of our ordinary shares is likely to remain volatile and could be subject to wide fluctuations in price in response to various factors, some of which are beyond our control. These factors include:

- changes in financial estimates, including our ability to meet our future revenue and operating profit or loss projections;
- fluctuations in our operating results or those of other semiconductor or comparable companies;
- fluctuations in the economic performance or market valuations of companies perceived by investors to be comparable to us;
- economic developments in the semiconductor industry as a whole;

- general economic conditions and slow or negative growth of related markets;
- announcements by us or our competitors of acquisitions, new products, significant contracts or orders, commercial relationships or capital commitments;
- our ability to develop and market new and enhanced solutions on a timely basis;
- changes in the demand for our customers' products;
- commencement of or our involvement in litigation;
- disruption to our operations;
- any major change in our board of directors or management;
- political or social conditions in the markets where we sell our products;
- changes in governmental regulations; and
- changes in earnings estimates or recommendations by securities analysts.

In addition, the stock market in general, and the market for semiconductor and other technology companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. These broad market and industry factors may cause the market price of our ordinary shares to decrease, regardless of our actual operating performance. These trading price fluctuations may also make it more difficult for us to use our ordinary shares as a means to make acquisitions or to use options to purchase our ordinary shares to attract and retain employees. If the market price of our ordinary shares declines, you may not realize any return on your investment in us and may lose some or all of your investment. In addition, in the past, following periods of volatility in the overall market and the market price of a company's securities, securities class action litigation has often been instituted against these companies. This litigation, if instituted against us, could result in substantial costs and a diversion of our management's attention and resources.

If securities analysts or industry analysts downgrade our ordinary shares, publish negative research or reports or fail to publish reports about our business, our stock price and trading volume could decline.

The trading market for our ordinary shares will be influenced by the research and reports that industry or securities analysts publish about us, our business and our market. If one or more analysts adversely changes their recommendation regarding our stock or our competitors' stock, our stock price would likely decline. If one or more analysts cease coverage of us or fail to regularly publish reports on us, we could lose visibility in the financial markets which in turn could cause our stock price or trading volume to decline.

Our actual operating results may differ significantly from our guidance and investor expectations, which would likely cause our stock price to decline.

From time to time, we may release guidance in our earnings releases, earnings conference calls or otherwise, regarding our future performance that represent our management's estimates as of the date of release. If given, this guidance, which will include forward-looking statements, will be based on projections prepared by our management. Projections are based upon a number of assumptions and estimates that, while presented with numerical specificity, are inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond our control. The principal reason that we expect to release guidance is to provide a basis for our management to discuss our business outlook with analysts and investors. With or without our guidance, analysts and other investors may publish expectations regarding our business, financial performance and results of operations. We do not accept any responsibility for any projections or reports published by any such third persons.

Guidance is necessarily speculative in nature, and it can be expected that some or all of the assumptions of the guidance furnished by us will not materialize or will vary significantly from actual results. If our actual performance does not meet or exceed our guidance or investor expectations, the trading price of our ordinary shares is likely to decline.

The price of our ordinary shares could decrease as a result of shares being sold in the market.

Sales of a substantial number of our ordinary shares in the public market, or the perception that these sales might occur, could cause the market price of our ordinary shares to decline. We filed registration statements on Form S-8 under the Securities Act to register shares for issuance under our 2004 Stock Plan, 2012 Equity Incentive Plan and the Amended and Restated 2012 Employee Stock Purchase Plan. Our 2012 Equity Incentive Plan and the Amended and Restated 2012 Employee Stock Purchase Plan provide for automatic increases in the shares reserved for issuance under these plans which could result in additional dilution to our shareholders. These shares can be freely sold in the public market upon issuance and vesting, subject to restrictions provided under the terms of the applicable plan and/or the option agreements entered into with option holders.

We may also issue ordinary shares or securities convertible into ordinary shares from time to time in connection with a financing, acquisition or otherwise. Any such issuance could result in substantial dilution to our existing shareholders and cause the trading price of our stock to decline.

We do not intend to pay dividends on our ordinary shares and, consequently, a shareholder's ability to achieve a return on its investment will depend on appreciation in the price of our ordinary shares.

We have never declared or paid any cash dividends on our ordinary shares and do not currently intend to do so for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Therefore, shareholders are not likely to receive any dividends on their ordinary shares for the foreseeable future and the success of an investment in our ordinary shares will depend upon any future appreciation in their value. There is no guarantee that our ordinary shares will appreciate in value or even maintain the price at which our shareholders have purchased their shares. Investors seeking cash dividends should not purchase our ordinary shares.

Provisions of our memorandum and articles of association and Cayman Islands corporate law may discourage or prevent an acquisition of us which could adversely affect the value of our ordinary shares.

Provisions of our memorandum and articles of association and Cayman Islands law may have the effect of delaying or preventing a change of control or changes in our management. These provisions include the following:

- the division of our board of directors into three classes;
- the right of our board of directors to elect a director to fill a vacancy created by the expansion of our board of directors or due to the resignation or departure of an existing board member;
- prohibition of cumulative voting in the election of directors which would otherwise allow less than a majority of shareholders to elect director candidates;
- the requirement for the advance notice of nominations for election to our board of directors or for proposing matters that can be acted upon at a shareholders' meeting;
- the ability of our board of directors to issue, without shareholder approval, such amounts of preference shares as the board of directors deems necessary and appropriate with terms set by our board of directors, which rights could be senior to those of our ordinary shares;
- the elimination of the rights of shareholders to call a special meeting of shareholders and to take action by written consent in lieu of a meeting; and
- the required approval of a special resolution of the shareholders, being a two-thirds vote of shares held by shareholders present and voting at a shareholder meeting, to alter or amend the provisions of our post-offering memorandum and articles of association.

Holders of our ordinary shares may face difficulties in protecting their interests because we are incorporated under Cayman Islands law.

Our corporate affairs are governed by our amended and restated memorandum and articles of association, by the Companies Law (as the same may be supplemented or amended from time to time) of the Cayman Islands and by the common law of the Cayman Islands. The rights of our shareholders and the fiduciary responsibilities of our directors under Cayman Islands law are not as clearly established as under statutes or judicial precedent in existence in jurisdictions in the United States. In particular, the Cayman Islands has a less developed body of securities laws than the United States and provides significantly less protection to investors. There is no legislation specifically dedicated to the rights of investors in securities and thus no statutorily defined private cause of action specific to investors such as those provided under the Securities Act or the Securities Exchange Act of 1934, as amended. In addition, shareholders of Cayman Islands companies may not have standing to initiate shareholder derivative actions in U.S. federal courts. Therefore, you may have more difficulty in protecting your interests in the face of actions by our management, directors or controlling shareholders than would shareholders of a corporation incorporated in a

jurisdiction in the United States due to the comparatively less developed nature of Cayman Islands law in this area.

Shareholders of Cayman Islands exempted companies, such as our company, have no general rights under Cayman Islands law to inspect corporate records and accounts or to obtain copies of lists of shareholders of the company. Our directors have discretion under our articles of association to determine whether or not, and under what conditions, our corporate records may be inspected by our shareholders, but are not obliged to make them available to our shareholders. This may make it more difficult for you to obtain the information needed to establish any facts necessary for a shareholder motion or to solicit proxies from other shareholders in connection with a proxy contest.

Subject to limited exceptions, under Cayman Islands law, a minority shareholder may not bring a derivative action against the board of directors.

Holders of our ordinary shares may have difficulty obtaining or enforcing a judgment against us because we are incorporated under the laws of the Cayman Islands.

It may be difficult or impossible for you to bring an action against us in the Cayman Islands if you believe your rights have been infringed under U.S. securities laws. There is no statutory recognition in the Cayman Islands of judgments obtained in the United States, although the courts of the Cayman Islands will in certain circumstances recognize and enforce a non-penal judgment of a foreign court of competent jurisdiction without retrial on the merits. While there is no binding authority on this point, this is likely to include, in certain circumstances, a non-penal judgment of a United States court imposing a monetary award based on the civil liability provisions of the U.S. federal securities laws. The Grand Court of the Cayman Islands may stay proceedings if concurrent proceedings are being brought elsewhere. There is uncertainty as to whether the Grand Court of the Cayman Islands would recognize or enforce judgments of United States courts obtained against us predicated upon the civil liability provisions of the securities laws of the United States or any state thereof and whether the Grand Court of the Cayman Islands would hear original actions brought in the Cayman Islands against us predicated upon the securities laws of the United States or any state thereof.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our corporate headquarters are located in Santa Clara, California, consisting of approximately 50,000 square feet of facility spaces under leases that expire in May 2020 and September 2020, respectively. These facilities accommodate our principal sales, marketing, research and development, finance, and administration activities. We lease approximately 94,000 square feet of facility spaces in Hsinchu, Taiwan under lease agreements that expire in December 2019, May 2020, June 2020 and January 2028. The Taiwan facilities accommodate research and development, business development, operations, and administration support. We lease approximately 44,500 square feet of facility spaces in Shanghai and Shenzhen, China, under leases that expire in November 2019, September 2020 and February 2021, to support research and business development. We lease approximately 12,100 square feet of office space in Italy for research and development. We lease additional facilities in Hong Kong for sales and inventory warehousing and in Japan and South Korea for our local business development personnel.

We believe that our existing facilities are well maintained and in good operating condition, and are sufficient for our needs for the foreseeable future. The following table lists our major locations and primary usage as of January 31, 2019:

	Approximate Square

Major Locations	Footage	Usage
United States:		
Santa Clara, California	50,000	Corporate Headquarters; Sales; Marketing; Research and Development; Finance; Administration
Asia Pacific:		
Hsinchu, Taiwan	94,000	Research and Development; Business Development; Operations; Administration
Shanghai, China	25,300	Research and Development; Business Development
Shenzhen, China	19,200	Research and Development; Business Development
Kowloon, Hong Kong	9,000	Sales; Warehousing
Shin-Yokohama, Japan	1,300	Business Development
SeongNam, South Korea	1,500	Business Development
Europe:		
Parma, Italy	12,100	Research and Development

ITEM 3. LEGAL PROCEEDINGS

We are not engaged in any material legal proceedings at this time.

ITEM 4. MINE SAFETY DISCLOSURES
Not applicable.

PART II

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

Market Information

Our ordinary shares have been traded on the NASDAQ Global Market under the symbol "AMBA" since October 10, 2012. Prior to that date, there was no public trading market for our ordinary shares. On March 15, 2019, there were 34 shareholders of record holding our ordinary shares. We cannot estimate the number of beneficial owners since many brokers and other institutions hold our shares on behalf of shareholders.

Share Performance Graph

This performance graph shall not be deemed to be "soliciting material" or "filed" or incorporated by reference in future filings with the Securities and Exchange Commission, or subject to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, except as shall be expressly set forth by specific reference in such filing.

The following graph shows a comparison from February 1, 2014 through January 31, 2019 of the cumulative total return for our ordinary shares, the NASDAQ Composite Index and the Philadelphia Semiconductor Index. The comparisons in the graph are historical and are not intended to forecast or be indicative of possible future performance of our ordinary shares.

Comparison of 5 year Cumulative Total Return

Dividends

We have never declared or paid any cash dividends on our ordinary shares and do not currently intend to do so in the foreseeable future.

Securities Authorized for Issuance under Equity Compensation Plans

For information about our equity compensation plans, see Note 11, "Employee Benefits and Stock-based Compensation" of the Notes to Consolidated Financial Statements included in this report.

Purchases of Equity Securities by the Issuer

The following table displays information with respect to repurchases of the Company's ordinary shares during the three months ended January 31, 2019.

Period	Total Number Of Shares Purchased (i)	Average Price Paid Per Share (ii)	Total Number Of Shares Purchased As Part of Publicly Announced Plans Or Programs (i)	Approximate Dollar Value Of Shares That May Yet Be Purchased Under The Plans Or Programs (in millions) (i)
November 1, 2018 to November 30, 2018	104,160	$ 33.44	104,160	
December 1, 2018 to December 31, 2018	—	—	—	
January 1, 2019 to January 31, 2019	—	—	—	
Total	104,160	$ 33.44	104,160	$ 31.9

(i) Our Board of Directors previously authorized a program to repurchase up to $125.0 million of our ordinary shares through June 30, 2018. On June 4, 2018, our Board of Directors authorized the repurchase of up to an additional $100.0 million of our ordinary shares over a twelve-month period commencing June 5, 2018. The repurchase program does not obligate us to acquire any particular amount of ordinary shares, and it may be suspended at any time at our discretion. Shares may be repurchased through open market purchases, 10b5-1 plans or privately negotiated transactions. Repurchases are funded using our working capital and any repurchased shares are recorded as authorized but unissued shares. As of January 31, 2019, we had repurchased an aggregate amount of $174.8 million of our ordinary shares, and we had approximately $31.9 million available to repurchase shares under the program through June 4, 2019.

(ii) The average price paid per share is calculated by total cash utilized (excluding commission) divided by total shares repurchased during the period.

Recent Sales of Unregistered Securities

None.

ITEM 6. SELECTED FINANCIAL DATA

The following table sets forth selected financial data as of and for the last five fiscal years, and should be read in conjunction with Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and Item 8, “Financial Statements and Supplementary Data,” and other financial data included elsewhere in this report. Our historical results of operations are not necessarily indicative of results of operations to be expected for any future period.

Selected Consolidated Statements of Operations Data:

	Year Ended January 31,				
	2019	2018	2017	2016	2015
	(in thousands, except per share data)				
Revenue	$227,768	$295,402	$310,297	$316,373	$218,278
Income (loss) from operations	$(40,420)	$24,431	$60,363	$84,679	$51,861
Net income (loss)	$(30,447)	$18,852	$57,810	$76,508	$50,571
Net income (loss) per share attributable to ordinary shareholders:					
Basic	$(0.93)	$0.57	$1.77	$2.42	$1.70
Diluted	$(0.93)	$0.55	$1.68	$2.27	$1.57

Selected Consolidated Balance Sheet Data:

	As of January 31,				
	2019	2018	2017	2016	2015
	(in thousands)				
Cash, cash equivalents and marketable securities	$358,908	$434,591	$405,394	$307,893	$207,994
Working capital	370,566	440,047	414,139	320,828	229,889
Total assets	466,853	546,649	512,271	410,615	284,284
Total liabilities	47,364	64,462	57,637	61,159	47,073
Total shareholders' equity	419,489	482,187	454,634	349,456	237,211

On June 25, 2015, we completed the acquisition of VisLab S.r.l., for $30.0 million in cash. Of this total purchase price, $4.1 million was attributed to intangible assets, $25.3 million was attributed to goodwill, and $0.6 million was attributed to net assets acquired. A deferred tax liability of $1.3 million related to the intangible assets was recorded to account for the difference between financial reporting and tax basis at the acquisition date, with an addition to goodwill.

In November 2015, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update No. 2015-17, Balance Sheet Classification of Deferred Taxes. To simplify the presentation, the new guidance requires that all deferred tax assets and liabilities, along with any related valuation allowance, be classified as noncurrent on the balance sheet. We adopted this standard in the fourth quarter of fiscal year 2016 on a prospective basis. The adoption of this new guidance resulted in all deferred tax assets and liabilities being classified as noncurrent in the consolidated balance sheets as of January 31, 2016. The prior periods were not restated for this presentation standard.

Upon adoption of Accounting Standards Update No. 2015-05, Intangible - Goodwill and Other - Internal-Use Software (Subtopic 350-40), we account for a noncancelable on premise internal-use software license as the acquisition of an intangible asset and the incurrence of a liability to the extent that all or a portion of the software licensing fees are not paid on or before the license acquisition date. The intangible asset and related liability are recorded at net present value and interest expense is recorded over the payment term. As of January 31, 2019, there were $6.8 million of intangible assets, net of amortization expense, $4.9 million of current liabilities and $0.3 million of noncurrent liabilities related to these noncancelable internal-use software licenses recorded in the consolidated balance sheets.

Effective February 1, 2018, we adopted Accounting Standards Codification (“ASC”) Topic 606, Revenue from Contracts with Customers (“ASC 606”) using a modified retrospective method with the cumulative effect recognized in the beginning retained earnings. The consolidated financial statements for the fiscal year ended January 31, 2019 are reported under Topic 606, whereas the consolidated financial statements for the fiscal year 2018 and prior years are reported under Topic 605. See Note 2, "Revenue Recognition" of the Notes to Consolidated Financial Statements included in this report for more details.

In the fourth quarter of fiscal year 2019, we released $8.0 million of valuation allowance related to prior year federal research and development credit carryforwards, which resulted in a significant increase in deferred tax assets as of January 31, 2019. See Note 13, “Income Taxes” of the Notes to Consolidated Financial Statements included in this report for more details.

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

Overview

We are a leading developer of semiconductor processing solutions for video that enable high-definition, or HD, video capture, analysis, sharing and display. A device that captures video includes four primary components: a lens, an image sensor, a video processor and storage memory. The video processor converts raw video input into a format that can be stored and distributed efficiently and, in some cases, analyzes the video data to automate processes. We combine our processor design capabilities with our expertise in video and image processing, computer vision algorithms and software development to provide a technology platform that is designed to be easily scalable across multiple applications in a variety of markets and enable rapid and efficient product development for our customers. Our system-on-a-chip, or SoC, designs fully integrate HD video processing, image processing, computer vision functionality, audio processing, and system functions onto a single chip, delivering exceptional video and image quality at high compression rates, differentiated functionality and low power consumption.

Over the last several years, we have been expanding our development efforts on computer vision technology that complements our image processing and video compression technology. We believe that enhanced computer vision functionality is critical both to our current video markets, such as IP security camera, as well as future markets such as automotive OEM cameras for advanced driving assistance systems, or ADAS, and autonomous vehicles, and robotics. Our recent development efforts have focused on creating advanced computer vision algorithms and high-performance, low-power hardware platforms to enhance processing acceleration, which we refer to as our CVflow architecture. In 2017, we introduced our first computer vision semiconductor chip, the CV1 SoC. In 2018, we introduced three new computer vision-based SoCs to enable our customers to develop intelligent camera systems for a variety of markets at different feature levels.

Our revenue over the last three years has been generated primarily from sales of our solutions for incorporation into specialized video and image capture devices such as wearable sports cameras, automotive aftermarket cameras, IP security cameras and cameras incorporated into unmanned aerial vehicles, or UAVs or drones. Our revenue from several of these markets, however, has recently experienced significant declines. As a result, we believe that our future revenue growth, if any, will significantly depend upon our ability to expand within the camera markets with our video and image processing SoC solutions, particularly in the professional IP security and home security and monitoring camera markets, as well as emerging markets such as the OEM automotive and robotics markets. We expect our research and development expenditures to increase in comparison to prior periods as we devote additional resources to the development of innovative video and image processing solutions with increased functionality, such as computer vision capabilities, and as we target new markets, such as the automotive OEM and robotics markets.

We sell our solutions to leading original design manufacturers, or ODMs, and original equipment manufacturers, or OEMs, globally. We refer to ODMs as our customers and OEMs as our end customers, except as otherwise indicated or as the context otherwise requires. In the camera market, our solutions enable the creation of high-quality video content in wearable cameras, automotive cameras, Internet Protocol, or IP, security cameras, for both professional use and home security and monitoring, unmanned aerial vehicle cameras, also referred to as UAVs or drones, and virtual reality cameras, also referred to as 360° cameras. We also recently introduced, and continue to develop, solutions to address emerging markets, such as the incorporation of computer vision functionality for OEM automotive ADAS applications and robotics markets.

Our sales cycles typically require a significant investment of time and a substantial expenditure of resources before we can realize revenue from the sale of our solutions, if any. Our typical sales cycle consists of a multi-month sales and development process involving our customers' system designers and management along with our sales personnel and software engineers. If successful, this process culminates in a customer's decision to use our solutions in its system,

which we refer to as a design win. Our sales efforts are typically directed to the OEM of the product that will incorporate our video and image processing solution, but the eventual design and incorporation of our SoC into the product may be handled by an ODM on behalf of the OEM.

Volume production may begin within six to 18 months or even longer after a design win, depending on the targeted market, the complexity of our customer's product and other factors upon which we may have little or no influence. Once one of our solutions has been incorporated into a customer's design, we believe that our solution is likely to remain a component of the customer's product for its life cycle because of the time and expense associated with redesigning a product or substituting an alternative solution. Conversely, a design loss to a competitor will likely preclude any opportunity for us to generate future revenue from such customer's product. Even if we obtain a design win and our SoC remains a component through the life cycle of a customer's product, the volume and timing of actual sales of our SoCs to the customer depend upon the production, release and market acceptance of that product, none of which are within our control. A portable consumer device typically has a product life cycle of six to 18 months, while an IP security camera typically has a product life cycle of 12 to 24 months. We anticipate that most OEM automotive products will have life cycles longer than two years.

Fiscal Year 2019 Financial Highlights and Trends

- We recorded revenue of $227.8 million in fiscal year 2019, a decrease of 22.9% as compared to fiscal year 2018. The decrease in revenue was primarily attributable to declines in revenue from wearable camera markets, including the sports camera, virtual reality and non-sports wearable camera markets. The decrease was also attributable to lower revenue from the drone market as a result of a major customer in the drone market shifting its consumer-based drones to competitive solutions, as well as continued weakness from smaller drone customers. The declines in revenue in the wearable camera and drone markets were partially offset by revenue growth in the automotive and IP security camera markets. The revenue growth in the automotive camera market was primarily due to a significant increase in shipments of OEM automotive video recorders in the Japan and China regions, offset by lower revenue from the automotive aftermarket. In the consumer IP security camera market, growth was led by the home security and monitoring market in the North America region, partially offset by a decline in revenue from the Asia region. The increased revenue in the IP security market was also attributable to revenue growth in the professional IP security camera market outside the China region, offset by a decline in revenue from a major Chinese customer.
- We recorded an operating loss of $40.4 million in fiscal year 2019, as compared to operating income of $24.4 million in fiscal year 2018. The decrease in operating income was primarily due to decreased revenue and increased expenses incurred primarily in support of new applications for the automotive OEM market as well as the development of computer vision-based solutions. The increase in expenses related primarily to increased research and development headcount, chip tape-out fees and increased stock-based compensation expense.
- We generated cash flows from operating activities of $24.5 million in fiscal year 2019, as compared to $85.4 million in fiscal year 2018. The decreased cash flows from operating activities were primarily due to decreased net income as a result of decreased revenue and increased operating expenses. The decrease in cash flows from operating activities also was attributable to decreased liabilities associated with the timing of payments to suppliers and decreased cash receipts associated with the timing of payments from customers. The decrease in cash flows from operating activities was partially offset by decreased inventory purchases associated with lower revenue in fiscal year 2019.
- On June 4, 2018, our Board of Directors authorized the repurchase of up to an additional $100.0 million of our ordinary shares over a twelve-month period commencing June 5, 2018. We repurchased 2,485,992 shares for approximately $99.9 million in cash during the twelve months ended January 31, 2019. As of January 31, 2019, we had repurchased a total of 3,985,876 shares for approximately $174.8 million in cash since the inception of repurchase programs in June 2016 and approximately $31.9 million remained available for repurchases under the current repurchase program through June 4, 2019. Repurchases are funded using working capital and any repurchased shares are recorded as authorized but unissued shares.

Factors Affecting Our Performance

Design Wins. We closely monitor design wins by customer and end market. We consider design wins to be critical to our future success, although a design win may not successfully materialize into revenue, and even if it does result in revenue, the amount generated by each design win can vary significantly. Our long-term sales expectations are based on forecasts from customers and internal estimations of customer demand factoring in the expected time to market for end customer products incorporating our solutions and associated revenue potential. Our ability to accurately forecast demand, however, can be adversely affected by a number of factors, including inaccurate forecasting by our customers, miscalculations by our customers of their inventory requirements, changes in market conditions, adverse changes in our product order mix and fluctuating demand for our customers' products.

Pricing, Product Cost and Margin. Our pricing and margins depend on the volumes and features of the solutions we provide to our customers. Additionally, we make significant investments in new solutions for both cost improvements and new features that we expect to drive revenue and maintain margins. In general, solutions incorporated into more complex configurations, such as those used in high-performance camera applications or, in the future, advanced driver assistance systems, have higher prices and higher gross margins as compared to solutions sold into lower-performing, more competitive camera applications. Our average selling price can vary by market and application due to

market-specific supply and demand, the maturation of products launched in previous years and the launch of new products by us or our competitors.

We continually monitor the cost of our solutions. As we rely on third-party manufacturers for the manufacture of our products, we maintain a close relationship with these suppliers to continually monitor production yields, component costs and design efficiencies.

Ability to Capitalize on Computer Vision Trends. We expect that computer vision functionality will become an increasingly important requirement in many of our current and future markets, including IP security, automotive, robotics, and UAV markets. As a result, we believe that our ability to develop advanced computer vision technology, enable and support customer product development in emerging applications, such as ADAS, advanced blind spot detection, object detection, people recognition, retail analytics, and machine learning, and gain customer acceptance of our technology platform and solutions, will be critical to our future success.

Shifting Consumer Preferences. Our revenue is also subject to consumer preferences, regarding form factor and functionality, and how those preferences impact the video and image capture electronics that we support. For example, improved smartphone video capture capabilities led to the decline of video cameras aimed at the video and image capture market. The current video and image capture market is now characterized by a greater volume of more specialized video and image capture devices that are less likely to be replaced with smartphones, such as wearable, IP security, UAV and automotive cameras. This increasing specialization of video capture devices has changed our customer base and end markets and has impacted our revenue. In the future, we expect further changes will continue to impact our business performance in those markets.

Continued Concentration of Revenue by End Market. Historically, our revenue has been significantly concentrated in a small number of end markets. In fiscal year 2010, the majority of our revenue came from the pocket video, camcorder and infrastructure markets. Since that time, we have developed technologies to provide solutions for new markets as they emerged, such as the wearable, IP security, UAV and automotive video recorder camera markets. Since fiscal year 2013, the wearable sports, professional IP security and UAV markets have been our largest end markets and sales into these markets collectively generated the majority of our revenue. We believe, however, that expansion into new markets is required to facilitate revenue growth and customer diversification as our revenue from the wearable camera and UAV camera markets has recently declined. While we will continue to seek to expand our end market exposure, we anticipate that sales to a limited number of end markets will continue to account for a significant percentage of our total revenue for the foreseeable future. Our end market concentration may cause our financial performance to fluctuate significantly from period to period based on the success or failure of products that our SoCs are designed into as well as the overall growth or decline in the video capture markets in which we compete. In addition, we derive a significant portion of our revenue from a limited number of ODMs who build products on behalf of a limited number of OEMs and from a limited number of OEMs to whom we ship directly. We believe that our operating results for the foreseeable future will continue to depend on sales to a relatively small number of customers.

Ability to Capitalize on Connectivity Trends. Mobile connected devices are ubiquitous today and play an increasingly prominent role in consumers' lives. The constant connectivity provided by these devices has created a demand for connected electronic peripherals such as video and image capture devices. Our ability to capitalize on these trends by supporting our end customers in the development of connected peripherals that seamlessly cooperate with other connected devices and allow consumers to distribute and share video and images with online media platforms is critical for our success. We have added wireless communication functionality into our solutions for wearable, IP security, UAV and automotive video recorder cameras. The combination of our compression technology with wireless connectivity enables wireless video streaming and uploading of videos and images to the Internet. Our solutions enable IP security camera systems to stream video content to either cloud infrastructure or connected mobile devices, and our solutions for wearable and UAV cameras allow consumers to quickly stream or upload video and images to social media platforms.

Sales Volume. A typical camera design win that successfully launches into the marketplace can generate a wide range of sales volumes for our solutions, depending on the end market demand for our customers' products. This can depend on several factors, including the reputation of the end customer, market penetration, product capabilities, size of the end market that the product addresses and our end customers' ability to sell their products. In certain cases, we may

provide volume discounts on sales of our solutions, which may be offset by lower manufacturing costs related to higher volumes. In general, our customers with greater market penetration and better branding tend to develop products that generate larger volumes over the product life cycle.

Customer Product Life Cycle. We estimate our customers' product life cycles based on the customer, type of product and end market. We typically commence commercial shipments from six to 18 months following a design win; however, in some markets, more lengthy product and development cycles are possible, depending on the scope and nature of the project, such as in the automotive OEM market. A portable consumer device typically has a product life cycle of six to 18 months, and an IP security camera typically has a product life cycle of 12 to 24 months. We anticipate that product development and product life cycles will typically be substantially longer in the OEM automotive and robotics markets.

Results of Operations

The following table sets forth our historical operating results for the periods indicated:

	Year Ended January 31,		
	2019	2018	2017
	(dollars in thousands)		
Revenue	$227,768	$295,402	$310,297
Cost of revenue	89,624	107,669	105,283
Gross profit	138,144	187,733	205,014
Operating expenses:			
Research and development	128,084	115,510	101,205
Selling, general and administrative	50,480	47,792	43,446
Total operating expenses	178,564	163,302	144,651
Income (loss) from operations	(40,420)	24,431	60,363
Other income, net	5,868	1,298	518
Income (loss) before income taxes	(34,552)	25,729	60,881
Provision (benefit) for income taxes	(4,105)	6,877	3,071
Net income (loss)	$(30,447)	$18,852	$57,810

The following table sets forth our historical operating results as a percentage of revenue of each line item for the periods indicated:

	Year Ended January 31,		
	2019	2018	2017
Revenue	100%	100%	100%
Cost of revenue	39	36	34
Gross profit	61	64	66
Operating expenses:			
Research and development	56	39	33
Selling, general and administrative	22	16	14
Total operating expenses	78	55	47
Income (loss) from operations	(17)	9	19
Other income, net	2	—	—
Income (loss) before income taxes	(15)	9	19
Provision (benefit) for income taxes	(2)	2	1
Net income (loss)	(13)%	7%	18%

Revenue

We derive substantially all of our revenue from the sale of HD and Ultra HD video and image processing SoC solutions to OEMs and ODMs, either directly or through our distributors. In recent years, our SoC solutions have been

primarily used in the camera markets, such as IP security, automotive video recorder, drone and wearable cameras. Although we expect these camera markets, in particular the IP security camera market, to continue to generate revenue for the foreseeable future, we have recently introduced new SoCs targeting emerging computer vision applications in the OEM automotive and robotics markets. We derive a substantial portion of our revenue from sales made indirectly through one of our distributors, Wintech Microelectronics Co., Ltd., or Wintech, and directly to one of our ODM customers, Chicony Electronics Co., Ltd., or Chicony.

We have historically experienced seasonal fluctuations in our quarterly revenue with our third fiscal quarter normally being the highest revenue quarter. This fluctuation has been driven primarily by increased sales in consumer camera markets as our customers build inventories in preparation for the holiday shopping season. Due to experienced declines in demand for our solutions in several consumer camera markets, including wearable camera, virtual reality and drone markets, the seasonal impact on quarterly revenue was not significant in fiscal year 2019. More generally, our average selling prices fluctuate based on the mix of our solutions sold in a period which reflects the impact of both changes in unit sales of existing solutions as well as the introduction and sales of new solutions. Our solutions are typically characterized by a life cycle that begins with higher average selling prices and lower volumes, followed by broader market adoption, higher volumes and average selling prices that are lower than initial levels.

The end markets into which we sell our products have seen significant changes as consumer preferences have evolved in response to new technologies. As a result, the composition and timing of our revenue may differ meaningfully during periods of technology or consumer preference changes. We expect shifts in consumer use of video capture to continue to change over time, as computer vision specialized use cases emerge and video capture continues to proliferate.

Cost of Revenue and Gross Margin

Cost of revenue includes the cost of materials such as wafers processed by third-party foundries, costs associated with packaging, assembly and testing, and our manufacturing support operations such as logistics, planning and quality assurance. Cost of revenue also includes indirect costs such as warranty, inventory valuation reserves and other general overhead costs.

We expect that our gross margin may fluctuate from period to period as a result of changes in average selling price, product mix and the introduction of new products by us or our competitors. In general, solutions incorporated into more complex configurations, such as those used in high-performance cameras, and in the future advanced automotive OEM applications, have had or are expected to have higher prices and higher gross margins, as compared to solutions sold into the lower-performance, more competitive camera applications. As semiconductor products mature and unit volumes sold to customers increase, their average selling prices typically decline. These declines may be paired with improvements in manufacturing yields and lower wafer, packaging and test costs, which offset some of the margin reduction that could result from lower selling prices. We believe that our gross margin will decline in the future as we continue to penetrate the highly competitive camera market and, in particular, the IP security market.

Research and Development

Research and development expense consists primarily of personnel costs, including salaries, stock-based compensation and employee benefits. The expense also includes costs of development incurred in connection with our collaborations with our foundry vendors, costs of licensing intellectual property from third parties for product development, costs of development for software and hardware tools, cost of fabrication of mask sets for prototype products, and allocated depreciation and facility expenses. All research and development costs are expensed as incurred. We expect our research and development expense to increase in absolute dollars as we continue to enhance and expand our product features and offerings and increase headcount for new SoC development and development of computer vision technology, especially for the OEM automotive market.

Selling, General and Administrative

Selling, general and administrative expense consists primarily of personnel costs, including salaries, stock-based compensation and employee benefits for our sales, marketing, finance, human resources, information technology and administrative personnel. The expense also includes professional service costs related to accounting, tax, legal services, and allocated depreciation and facility expenses. We expect our selling, general and administrative expense to increase in absolute dollars as we continue to maintain the infrastructure and expand the size of our sales and marketing organization to support our business strategy of addressing new opportunities with our computer vision technology.

Other Income, Net

Other income consists primarily of interest income from investments in debt securities, interest income from deposits with financial institutions and in fiscal year 2019 a grant from a foreign government, net of interest expense incurred for intangible assets purchased and gains and losses from foreign currency transactions and remeasurements.

Provision (Benefit) for Income Taxes

We are incorporated and domiciled in the Cayman Islands and also conduct business in several countries such as the United States, China, Taiwan, Hong Kong, Italy, South Korea and Japan, and we are subject to taxation in those jurisdictions. Our worldwide operating income is subject to varying tax rates, and our effective tax rate is highly dependent upon the geographic distribution of our earnings or losses and the tax laws and regulations in each geographical region. It is also subject to fluctuation from changes in the valuation of our deferred tax assets and liabilities; tax benefits from excess stock-based compensation deductions; transfer pricing adjustments and the tax effects of nondeductible compensation. We have historically had lower effective tax rates as a substantial percentage of our operations are conducted in lower-tax jurisdictions. If our operational structure was to change in such a manner that would increase the amount of operating income subject to taxation in higher-tax jurisdictions, or if we were to commence operations in jurisdictions assessing relatively higher tax rates, our effective tax rate could fluctuate significantly on a quarterly basis and/or be adversely affected.

Significant judgment is required in evaluating our uncertain tax positions and determining our provision for income taxes. Although we believe our reserves are reasonable, no assurance can be given that the final tax outcome of these matters will not be different from that which is reflected in our historical provision for income taxes and accruals. We adjust these reserves in light of changing facts and circumstances, such as the closing of a tax audit or the refinement of an estimate. To the extent that the final tax outcome of these matters is different than the amounts recorded, such differences will impact the provision for income taxes in the period in which such determination is made. The provision for income taxes includes the impact of uncertain tax position reserves and changes to reserves that are considered appropriate, as well as the related net interest and penalties.

Significant judgment is also required in determining any valuation allowance recorded against deferred tax assets. In assessing the need for a valuation allowance, we consider all available evidence, including past operating results, estimates of future taxable income, and the feasibility of tax planning strategies. In the event that we change our determination as to the amount of deferred tax assets that can be realized, we will adjust our valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

Comparison of the Fiscal Years Ended January 31, 2019, 2018 and 2017

Revenue

	Year Ended January 31,			Change 2019		2018	
	2019	2018	2017	Amount	%	Amount	%
	(dollars in thousands)						
Revenue	$227,768	$295,402	$310,297	$(67,634)	(22.9)%	$(14,895)	(4.8)%

Revenue decreased for fiscal year 2019, as compared to fiscal year 2018, primarily due to declines in revenue from wearable camera markets, including the sports camera, virtual reality and non-sports wearable camera markets. The decrease was also attributable to lower revenue from the drone market as a result of a major customer in the drone market shifting its consumer-based drones to competitive solutions, as well as continued weakness from smaller drone customers. The declines in revenue in the wearable camera and drone markets were partially offset by revenue growth in the automotive and IP security camera markets. The revenue growth in the automotive camera market was primarily due to a significant increase in shipments of OEM automotive video recorders in the Japan and China regions, offset by lower revenue from the automotive aftermarket. In the consumer IP security camera market, growth was led by the home security and monitoring market in the North America region, partially offset by a decline in revenue from the Asia region. The increased revenue in the IP security market was also attributable to revenue growth in the professional IP security camera market outside the China region, offset by a decline in revenue from a major Chinese customer.

Revenue decreased for fiscal year 2018, as compared to fiscal year 2017, primarily due to our major customer in the sports camera market, GoPro, incorporating a competing solution into one of its recently released mainstream camera models that significantly reduced our sales to GoPro in fiscal year 2018. Compared to fiscal year 2017, revenue from GoPro declined by 50.3% from $74.9 million in fiscal year 2017 to $37.2 million in fiscal year 2018. The decrease

was also attributable to a decline in revenues from DJI in the drone market as the customer's product mix shifted to non-Ambarella-based drones, as well as continued weakness from smaller consumer drone customers. The declined revenues in sports camera and drone markets were partially offset by strong revenue growth in the IP security, automotive and non-sports wearable camera markets. Revenue growth in the IP security camera market was primarily due to solid performance in the home security and monitoring camera market. In the automotive camera market, an increase in shipments of OEM automotive video recorders plus growth in shipments for the automotive aftermarket resulted in strong revenue growth in that market in fiscal year 2018. In fiscal year 2018, infrastructure revenue continued to decline as a percentage of total revenue from 2.4% in fiscal year 2017 to 1.6% in fiscal year 2018 due to continued weak market conditions in the United States and Europe as investment in network upgrades to the new H.265 video compression technology was delayed.

Cost of Revenue and Gross Margin

	Year Ended January 31,			Change 2019		2018	
	2019	2018	2017	Amount	%	Amount	%
	(dollars in thousands)						
Cost of revenue	$89,624	$107,669	$105,283	$(18,045)	(16.8)%	$2,386	2.3 %
Gross profit	138,144	187,733	205,014	(49,589)	(26.4)%	(17,281)	(8.4)%
Gross margin	60.7 %	63.6 %	66.1 %	—	(2.9)%	—	(2.5)%

Cost of revenue decreased for fiscal year 2019, as compared to fiscal year 2018, primarily due to lower shipments of higher cost SoCs associated with lower revenue in the wearable camera and drone markets. The decrease in cost of revenue was partially offset by increased shipments of SoCs for the IP security camera and automotive OEM markets.

Cost of revenue increased for fiscal year 2018, as compared to fiscal year 2017, primarily due to an increase in the number of SoC shipments, though at lower gross margins. The increase was also attributable to approximately $2.9 million of cost benefit received in fiscal year 2017 from the recovery and sale of previously written down inventory that did not recur in fiscal year 2018.

Gross margin continuously decreased, as compared to the prior fiscal years, primarily due to an increase in the percentage of our total revenue that was derived from the lower gross margin IP security camera market combined with the decline in revenue from the higher gross margin sports camera and drone markets.

Research and Development

	Year Ended January 31,			Change 2019		2018	
	2019	2018	2017	Amount	%	Amount	%
	(dollars in thousands)						
Research and development	$128,084	$115,510	$101,205	$12,574	10.9%	$14,305	14.1%

Research and development expense increased for fiscal year 2019, as compared to fiscal year 2018, primarily due to increases in engineering headcount and chip development cost associated with the computer vision technology development for our current markets, as well as new markets such as the automotive OEM and robotics markets. Our engineering headcount increased to 554 at January 31, 2019 compared to 519 at January 31, 2018, which resulted in an increase in salary-related expenses of approximately $7.0 million in fiscal year 2019. The increased research and development expense was also attributable to additional stock-based compensation expense of approximately $2.9 million in fiscal year 2019, as a result of the issuance of options and restricted stock units for newly hired employees, our annual evergreen stock program for existing employees, and performance stock program for executives. SoC development related costs increased by approximately $3.8 million for fiscal year 2019, as compared to fiscal year 2018, due to the timing and number of chips in development.

Research and development expense increased for fiscal year 2018, as compared to fiscal year 2017, primarily due to the increase in engineering headcount associated with new SoC hardware and software development, principally in support of our computer vision technology for our current markets as well as new markets such as the automotive OEM and robotics markets. Our research and development engineering headcount increased to 519 at January 31, 2018 compared to 491 at January 31, 2017. The increased engineering headcount resulted in increases in salary-related expenses of approximately $5.2 million in fiscal year 2018. The increased research and development expense was also attributable to additional stock-based compensation expense of approximately $4.8 million in fiscal year 2018, as a result of the issuance of options and restricted stock units for newly hired employees, our annual evergreen stock

program for existing employees and performance stock program for executives. SoC development related costs increased by approximately $3.8 million for fiscal year 2018 due to the timing and number of chips in development.

Selling, General and Administrative

	Year Ended January 31,			Change 2019		2018	
	2019	2018	2017	Amount	%	Amount	%
	(dollars in thousands)						
Selling, general and administrative	$50,480	$47,792	$43,446	$2,688	5.6%	$4,346	10.0%

Selling, general and administrative expense increased for fiscal year 2019, as compared to fiscal year 2018, primarily due to increased headcount to support our business development in IP security, automotive OEM and robotics markets, which resulted in an increase in salary-related expenses of approximately $1.8 million in fiscal year 2019. The increase was also attributable to additional stock-based compensation expense of approximately $1.1 million as a result of the issuance of options and restricted stock units for newly hired employees, our annual evergreen stock program for existing employees and performance stock program for executives.

Selling, general and administrative expense increased for fiscal year 2018, as compared to fiscal year 2017, primarily due to increased stock-based compensation expense of approximately $3.0 million as a result of the issuance of options and restricted stock units for newly hired employees, our annual evergreen stock program for existing employees and performance stock program for executives. The increase was also attributable to approximately $1.2 million of additional expenditures on outside professional services in fiscal year 2018 to support our business.

Other Income, Net

	Year Ended January 31,			Change			
				2019		2018	
	2019	2018	2017	Amount	%	Amount	%
	(dollars in thousands)						
Other income, net	$5,868	$1,298	$518	$4,570	352.1%	$780	150.6%

The increase in other income, net, for fiscal year 2019, as compared to fiscal year 2018, was primarily due to an aggregate of approximately $2.7 million of additional interest and other income from our deposits and debt security investments. The increase is primarily the result of larger invested balances, interest rate increases and debt securities purchased at discounts. In fiscal year 2019, we added an additional $100.0 million of capital in debt security investments. The increase was also attributable to a grant of approximately $1.8 million from a foreign government related to research and development activities which can, at our discretion, be used to satisfy certain types of future tax or social insurance liabilities.

The increase in other income, net, for fiscal year 2018, as compared to fiscal year 2017, was primarily due to approximately $579,000 of additional interest income from our deposits with financial institutions and approximately $498,000 of additional interest income from marketable security investments. The increase was partially offset by approximately $281,000 interest expense from software license liabilities.

Provision (Benefit) for Income Taxes

	Year Ended January 31,			Change			
				2019		2018	
	2019	2018	2017	Amount	%	Amount	%
	(dollars in thousands)						
Provision (benefit) for income taxes	$(4,105)	$6,877	$3,071	$(10,982)	(159.7)%	$3,806	123.9%
Effective tax rate	12 %	27 %	5 %	—	(15)%	—	22%

Income tax expense and the effective tax rate decreased in fiscal 2019, as compared to fiscal year 2018, primarily due to the release of $8.0 million of valuation allowance related to prior year federal research and development credit carryforwards, as well as the reduction in the U.S. federal statutory rate from 35% to 21%, partially offset by a decrease in the proportion of profits generated in lower tax jurisdictions and losses incurred in jurisdictions for which

we were not able to recognize a related tax benefit.

Income tax expense and effective tax rate increased in fiscal year 2018, as compared to fiscal year 2017, primarily due to an unfavorable change in our geographic mix of profits as well as an increase in deferred tax expense of $2.3 million as a result of the decrease in the corporate tax rate from 35% to 21% associated with the enactment of the Tax Cuts and Job Act of 2017. The increase was also attributable to approximately $3.0 million increase in non-deductible stock-based compensation expense. These increases were offset by a $1.9 million reduction in the amount of tax expense recorded for changes in valuation allowance, as the Company’s valuation allowance did not change significantly in fiscal year 2018.

Liquidity and Capital Resources

Cash Flows

The following table summarizes our cash flows for the periods indicated:

	Year Ended January 31,		
	2019	2018	2017
	(in thousands)		
Net cash provided by operating activities	$24,472	$85,404	$113,316
Net cash used in investing activities	(79,142)	(9,600)	(45,734)
Net cash used in financing activities	(97,953)	(52,003)	(12,764)
Net increase (decrease) in cash, cash equivalents and restricted cash	$(152,623)	$23,801	$54,818

Net Cash Provided by Operating Activities

Fiscal year 2019 compared to fiscal year 2018: Cash provided by operating activities decreased primarily due to decreased net income as a result of lower revenue and increased operating expenses. The decrease in cash flows from operating activities also was attributable to decreased liabilities associated with the timing of payments to suppliers and decreased cash receipts associated with the timing of payments from customers. The decrease was partially offset by decreased inventory purchases associated with lower revenue in fiscal year 2019.

Fiscal year 2018 compared to fiscal year 2017: Cash provided by operating activities decreased primarily due to decreased net income as a result of lower revenue and increased operating expenses adjusted for increased non-cash stock-based compensation expense. The decrease in cash flows from operating activities also was attributable to decreased liabilities associated with the timing of payments to suppliers and decreased deferred revenue. The decrease was partially offset by increased cash receipts associated with the timing of payments from our customers.

Net Cash Used in Investing Activities

Fiscal year 2019 compared to fiscal year 2018: Net cash used in investing activities increased primarily due to approximately $133.0 million of additional investments in debt securities. The increased cash used in investing activities was partially offset by an increase of approximately $62.7 million in cash receipts from the sale and maturity of debt securities.

Fiscal year 2018 compared to fiscal year 2017: Net cash used in investing activities decreased primarily due to a reduction of approximately $40.7 million of investments in debt securities compared to the prior fiscal year. The decreased investment expenditure was partially offset by approximately $3.6 million of fewer cash receipts from the sale and maturity of debt securities and approximately $1.0 million of additional investment in property and equipment in fiscal year 2018 compared to the prior fiscal year.

Net Cash Used in Financing Activities

Fiscal year 2019 compared to fiscal year 2018: Net cash used in financing activities increased primarily due to additional payments of $45.1 million in cash for the repurchase of our ordinary shares under a stock repurchase program. The increased cash used in financing activities also was attributable to additional payments of $0.4 million

in cash for intangible assets purchased, primarily software licenses, as well as approximately $0.4 million less in cash proceeds from option exercises in fiscal year 2019.

Fiscal year 2018 compared to fiscal year 2017: Net cash used in financing activities increased primarily due to additional payments of $34.6 million in cash for the repurchase of our ordinary shares under our stock repurchase program, as well as additional payments of $4.3 million in cash for intangible assets, primarily software licenses, purchased in fiscal year 2018 compared to the prior fiscal year.

Stock Repurchase Program

On June 4, 2018, our Board of Directors authorized the repurchase of up to an additional $100.0 million of our ordinary shares over a twelve-month period commencing June 5, 2018. Since the inception of the repurchase programs in June 2016, a total of $225.0 million has been authorized, and we have repurchased a total of 3,985,876 shares for approximately $174.8 million in cash. As of January 31, 2019, approximately $31.9 million remained available for repurchases under the current repurchase program through June 4, 2019. Repurchases under the program may be made from time-to-time through open market purchases, 10b5-1 plans or privately negotiated transactions subject to market conditions, applicable legal requirements and other relevant factors. The repurchase program does not obligate us to acquire any particular amount of ordinary shares, and it may be suspended at any time at the company's discretion. Repurchases are funded using working capital and any repurchased shares are recorded as authorized but unissued shares.

Sources of Liquidity

As of January 31, 2019 and 2018, we had cash, cash equivalents and marketable debt securities of approximately $358.9 million and $434.6 million, respectively. During the past three fiscal years, we invested a total of $200.0 million in highly liquid, short-term marketable debt securities. As of January 31, 2019, these securities had a fair value of approximately $205.1 million with insignificant unrealized gains caused by fluctuations in market value and interest rates. We hold these investments as available-for-sale securities and mark them to market.

Operating and Capital Expenditure Requirements

As of January 31, 2019, we had cash, cash equivalents and marketable securities of approximately $358.9 million. We believe that our existing cash balances will be sufficient to meet our anticipated cash requirements through at least the next 12 months. In the future, we expect our operating and capital expenditures to increase as we increase headcount, expand our business activities, and implement and enhance our information technology platforms. As we expand our operations, we may require more working capital. If our available cash balances are insufficient to satisfy our future liquidity requirements, we may seek to sell equity or convertible debt securities or borrow funds commercially. The sale of equity and convertible debt securities may result in dilution to our shareholders and those securities may have rights senior to those of our ordinary shares. If we raise additional funds through the issuance of convertible debt securities, these securities could contain covenants that would restrict our operations. We may require additional capital beyond our currently anticipated amounts. Additional capital may not be available to us on reasonable terms, or at all.

Our short- term and long-term capital requirements will depend on many factors, including the following:

- our ability to generate cash from operations;
- our ability to control our costs;
- the expansion of our research and development of new technologies and products to address new markets and applications;
- the emergence of competing or complementary technologies or products;
    - the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights or participating in litigation-related activities; and
- our acquisition of complementary businesses, products and technologies.

Contractual Obligations, Commitments and Contingencies

The following table summarizes our outstanding contractual obligations as of January 31, 2019:

	Payment Due by Period as of January 31, 2019 (in thousands)					
	Total	Less than 1 Year	1-3 Years	3-5 Years	More than 5 Years	All Other
Contractual Obligations						
Facility obligations under operating leases [1]	$4,854	$2,592	$1,396	$ 290	$ 576	$—
Technology licenses [2]	5,293	4,983	310	—	—	—
Purchase obligations [3]	28,206	28,206	—	—	—	—
Unrecognized tax benefits, including interest [4]	6,732	—	—	—	—	6,732

Total	$45,085	$35,781	$1,706	$ 290	$ 576	$6,732

(1) Facility obligations under operating leases primarily represent facilities with initial lease terms in excess of one year. They are located in United States, Taiwan, China, Hong Kong, Japan and Italy.
(2) Technology license obligations represent future cash payments for noncancelable internal-use software licenses which are used in product design.
(3) Purchase obligations consist primarily of inventory purchase obligations with our independent contract manufacturers.
(4) Unrecognized tax benefits, including interest, represent our liabilities for uncertain tax positions as of January 31, 2019. We are unable to reasonably estimate the timing of payments in individual years due to uncertainties in the timing of the effective settlement of tax positions.

Stock Options and Restricted Stock Units

Grants of stock-based awards are key components of the compensation packages we provide to attract and retain certain employees to align their interests with the interests of existing shareholders. We recognize that these stock-based awards will dilute existing shareholders and have sought to limit the number of shares granted while providing competitive compensation packages. As of January 31, 2019, we had a total of 3.8 million ordinary shares subject to outstanding stock options and unvested restricted stock and restricted stock units, which will potentially dilute our earnings per share. This potential dilution will only result if outstanding options vest and are exercised and restricted stock and restricted stock units vest and are settled. As of January 31, 2019, 55% of our outstanding options had exercise prices less than the then market price of our ordinary shares on such date.

Off-Balance Sheet Arrangements

As of January 31, 2019, we did not engage in any off-balance sheet arrangements, including the use of structured finance, special purpose entities or variable interest entities.

Recent Accounting Pronouncements

See Note 1, “Organization and Summary of Significant Accounting Policies—Recent Accounting Pronouncements” of the Notes to the Consolidated Financial Statements, included in Part IV, Item 15 of this report, for a full description of recent accounting standards, including the respective dates of adoption and effects on our consolidated financial position, results of operations and cash flows.

Critical Accounting Policies and Significant Management Estimates

The preparation of audited consolidated financial statements in conformity with U.S. generally accepted accounting principles, or GAAP, requires us to make estimates, judgments and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expense during the reported periods. On an ongoing basis, we evaluate our estimates and assumptions, including those related to (i) the collectability of accounts receivable; (ii) write down of excess and obsolete inventories; (iii) intangible assets and goodwill; (iv) the estimated useful lives of long-lived assets; (v) impairment of long-lived assets and financial instruments; (vi) warranty obligations; (vii) the valuation of stock-based compensation awards and financial instruments; (viii) the probability of performance objectives achievement; (ix) the realization of tax assets and estimates of tax liabilities, including reserves for uncertain tax positions; and (x) the recognition and disclosure of contingent liabilities. These estimates and assumptions are based on historical experience and on various other factors which we believe to be reasonable under the circumstances. We may engage third-party valuation specialists to assist with estimates related to the valuation of financial instruments, assets and stock awards associated with various contractual arrangements. Such estimates often require the selection of appropriate valuation methodologies and significant judgment. Actual results could differ from these estimates under different assumptions or circumstances and such differences could be material.

We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management’s judgment and estimates:

Revenue Recognition

Effective February 1, 2018, we adopted Accounting Standards Codification (“ASC”) Topic 606, Revenue from Contracts with Customers (“ASC 606”), using the modified retrospective method applied to those contracts that were not completed as of February 1, 2018. Results for reporting periods beginning after February 1, 2018 are presented

under ASC 606. Prior period amounts are not adjusted and continue to be reported in accordance with our historic accounting under ASC Topic 605, Revenue Recognition ("ASC 605"). The most significant impacts of this new guidance for us relate to the determination of transaction price and the timing of revenue recognition for transactions with distributors. As a result, we now recognize product revenue upon shipment and transfer of control to distributors (known as "sell-in" revenue recognition) rather than shipment to the end customers (known as "sell-through" revenue recognition) based on our estimate of the consideration we expect to receive. Revenue recognition is evaluated through the following five steps: (i) identification of the contract, or contracts, with a customer; (ii) identification of the performance obligations in the contract; (iii) determination of the transaction price; (iv) allocation of the transaction price to the performance obligations in the contract; and (v) recognition of revenue when or as a performance obligation is satisfied.

The sale of semiconductor products accounts for the substantial majority of our consolidated revenue. Sales agreements with customers are renewable periodically and contain terms and conditions with respect to payment, delivery, warranty, supply and other rights. We consider an accepted customer purchase order, governed by sales agreement, to be the contract with the customer. For each contract, we consider the promise to transfer tangible products to be the identified performance obligation. Product sales contracts may include volume-based tiered pricing or rebates that are fulfilled in cash or product. In determining the transaction price, we accounts for the right of returns, cash rebates, commissions and other pricing adjustments as variable consideration and estimate these amounts based on the expected amount to be provided to customers and reduce the revenue recognized. We estimate sales returns and rebates based on our historical patterns of return and pricing credits. As our standard payment terms are 30 days to 60 days, the contracts have no financing component. Under ASC 606, we estimate the total consideration to be received by using the expected value method for each contract, compute weighted average selling price for each unit shipped in cases where there is a material right due to the presence of volume-based tiered pricing, allocate the total consideration between the identified performance obligations, and recognize revenue when control of our goods and services is transferred to our customers. We consider product control to be transferred at shipment or delivery because we have a present right to payment at that time, the customer has legal title to the asset, we have transferred physical possession of the asset, and the customer has significant risk and rewards of ownership of the asset.

We also enter into fixed-price engineering service agreements with certain customers. These agreements may include multiple performance obligations, such as software development services, licensing of intellectual property and post-contract customer support, or PCS. These multiple performance obligations are highly interdependent, highly interrelated, are typically not sold separately and do not have standalone selling prices. They are all inputs to generate one combined output which is incorporating our SoC into the customer’s product. Accordingly, we determine that they are not separately identifiable and shall be treated as a single performance obligation. Customers usually pay based on milestones achieved. Because payments received do not correspond directly with the value of our performance to date, for fixed-price engineering services arrangements, revenue is recognized using the time-based straight line method, which best depicts our performance toward complete satisfaction of the performance obligation based on the nature of such professional services. Revenues from engineering service agreements were not material for the fiscal years ended January 31, 2019, 2018 and 2017, respectively.

Cash Equivalents and Marketable Debt Securities

We consider all highly liquid debt security investments with original maturities of less than three months at the time of purchase to be cash equivalents. Debt security investments that are highly liquid with original maturities at the time of purchase greater than three months are considered as marketable debt securities.

We classify these investments as “available-for-sale” securities carried at fair value, based on quoted market prices of similar assets, with the unrealized gains or losses reported, net of tax, as a separate component of shareholders’ equity and included in accumulated other comprehensive income (loss) in the consolidated balance sheets. The amortization of premiums and accretion of discounts and the realized gains and losses are both recorded in other income, net in the consolidated statements of operations. We review our investments for possible other-than-temporary impairments on a regular basis. If any loss on investment is believed to be other-than-temporary, a charge will be recorded and a new cost basis in the investment will be established. In evaluating whether a loss on a security is other-than-temporary, we consider the following factors: 1) general market conditions, 2) the duration and extent to which the fair value is less than cost, 3) our intent and ability to hold the investment.

For securities in an unrealized loss position which is deemed to be other-than-temporary, the difference between the security’s then-current amortized cost basis and fair value is separated into (i) the amount of the impairment related to the credit loss (i.e., the credit loss component) and (ii) the amount of the impairment related to all other factors (i.e., the non-credit loss component). The credit loss component is recognized in earnings. The non-credit loss component

is recognized in accumulated other comprehensive loss. Due to the relative short term nature of the investments, there have been no other-than-temporary impairments recorded to date.

Inventory Valuation

We record inventories at the lower of cost or net realizable value. The cost includes materials and other production costs and is computed using standard cost on a first-in, first-out basis. Inventory reserves are recorded for estimated obsolescence or unmarketable inventories based on forecast of future demand and market conditions. Any adjustments to reduce the cost of inventories to their net realizable value are recognized in earnings in the current period. Once inventory is written down, a new accounting cost basis is established and, accordingly, any associated reserve is not released until the inventory is sold or scrapped. There were no material inventory losses recognized for the fiscal years ended January 31, 2019, 2018 and 2017, respectively.

Noncancelable Software License

We account for a noncancelable on premise internal-use software license as the acquisition of an intangible asset and the incurrence of a liability to the extent that all or a portion of the software licensing fees are not paid on or before the license acquisition date. The intangible asset and related liability are recorded at net present value and interest expense is recorded over the payment term.

Goodwill and In-Process Research and Development

Goodwill and in-process research and development ("IPR&D") are required to be tested for impairment at least annually in the fourth fiscal quarter or sooner whenever events or changes in circumstances indicate that the assets may be impaired. We have a single reporting unit for goodwill impairment test purposes based on our business and reporting structure.

We do not amortize goodwill. Acquired IPR&D is capitalized at fair value as an intangible asset and amortization commences upon completion of the underlying projects. When a project underlying reported IPR&D is completed, the corresponding amount of IPR&D is reclassified as an amortizable purchased intangible asset and is amortized over its estimated useful life.

Stock-Based Compensation

We measure stock-based compensation for equity awards granted to employees and directors based on the estimated fair value on the grant date, and recognize that compensation as expense using the straight-line attribution method for service condition awards or using the graded-vesting attribution method for awards with performance conditions over the requisite service period, which is typically the vesting period of each award. We determine the fair value of restricted stock and restricted stock units with service or performance conditions based on the fair market value of our ordinary shares on the grant date. We use the Black-Scholes option pricing model to determine the fair value of stock options. Determining the fair value of stock options on the grant date requires the input of various assumptions, including stock price of the underlying ordinary share, the exercise price of the stock option, expected volatility, expected term, risk-free interest rate and dividend rate. In prior fiscal years, the expected term was calculated using the simplified method, and the expected volatility was calculated based on the weighted average of historical volatilities of our own stock price and the share prices of similar companies that are publicly available for a period commensurate with the expected term. Starting from fiscal year 2019, we calculate expected volatility based on our own historical stock price for a period commensurate with the expected term, which is computed based on our own historical exercise behavior. The risk-free interest rate is derived from an average of the U.S. Treasury constant maturity rates for the respective periods most closely commensurate with the expected term. The expected dividend yield is zero because we have not historically paid dividends and have no present intention to pay dividends. We use the Lattice pricing model and perform Monte Carlo Simulation to evaluate the fair value of awards with market conditions, including assumptions of historical volatility and risk-free interest rate commensurate with the vesting term. Upon adoption of ASU 2016-09, we elect to account for forfeitures as they occur.

Net Income (Loss) Per Ordinary Share

Basic earnings (losses) per share is computed by dividing net income (loss) available to ordinary shareholders by the weighted-average number of ordinary shares outstanding during the period. Diluted earnings (losses) per share is computed by dividing net income (loss) available to ordinary shareholders by the weighted-average number of ordinary shares outstanding during the period increased to include the number of additional ordinary shares that would have been outstanding if the potentially dilutive securities had been issued. Potentially dilutive securities include outstanding stock options, shares to be purchased under the Company's employee stock purchase plan, unvested

restricted stock and restricted stock units. The dilutive effect of potentially dilutive securities is reflected in diluted earnings (losses) per share by application of the treasury stock method.

Income Taxes

We record income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in our financial statements or tax returns. In estimating future tax consequences, generally all expected future events other than enactments or changes in the tax law or rates are considered. Valuation allowances are provided when necessary to reduce deferred tax assets to the amount expected to be realized.

We apply authoritative guidance for the accounting for uncertainty in income taxes. The guidance requires that tax effects of a position be recognized only if it is “more likely than not” to be sustained based solely on its technical merits as of the reporting date. Upon estimating our tax positions and tax benefits, we consider and evaluate numerous factors, which may require periodic adjustments and which may not reflect the final tax liabilities. We adjust our financial statements to reflect only those tax positions that are more likely than not to be sustained under examination.

As part of the process of preparing consolidated financial statements, we are required to estimate our taxes in each of the jurisdictions in which we operate. We estimate actual current tax exposure together with assessing temporary differences resulting from differing treatment of items, such as accruals and allowances not currently deductible for tax purposes. These differences result in deferred tax assets, which are included in the consolidated balance sheets. In general, deferred tax assets represent future tax benefits to be received when certain expenses previously recognized in the consolidated statements of operations become deductible expenses under applicable income tax laws, or loss or credit carryforwards are utilized.

In assessing whether deferred tax assets may be realized, we consider whether it is more likely than not that some portion or all of deferred tax assets will be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income.

We make estimates and judgments about our future taxable income based on assumptions that are consistent with our plans and estimates. Should the actual amounts differ from estimates, the amount of valuation allowance could be materially impacted. Any adjustment to the deferred tax asset valuation allowance would be recorded in the consolidated income statement for the periods in which the adjustment is determined to be required.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We had cash, cash equivalents and marketable securities totaling $358.9 million and $434.6 million at January 31, 2019 and 2018, respectively. Our cash is deposited in checking accounts with reputable financial institutions. The cash equivalents and marketable securities consist primarily of investments in debt securities. Our cash is held for working capital purposes. We do not enter into investments for trading or speculative purposes.

Interest Rate Fluctuation Risk

The primary objectives of our investment activities are to preserve principal, provide liquidity and maximize income without significantly increasing risk. Some of the securities we invest in are subject to market risk. This means that a change in prevailing interest rates may cause the principal amount of the investment to fluctuate. To minimize this risk, we maintain our portfolio of short-term investments in a variety of debt securities with high liquidity. We do not enter into investments for trading or speculative purposes. A 10% change in interest rates will not have a material impact on our future interest income or investment fair value. The risk associated with fluctuating interest rates is limited to our investment portfolio.

Foreign Currency Risk

To date, all of our product sales and inventory purchases have been denominated in U.S. dollars. We therefore have not had any foreign currency risk associated with these two activities. The functional currency of all of our entities is the U.S. dollar. Our operations outside of the United States incur operating expenses and hold assets and liabilities denominated in foreign currencies, principally the New Taiwan Dollar and the Chinese Yuan Renminbi. Our results of operations and cash flows are subject to fluctuations due to changes in foreign currency exchange rates, particularly the exchange rates between the Chinese Yuan Renminbi and the U.S. dollar and between the New Taiwan Dollar and the U.S. dollar. As we grow our operations, our exposure to foreign currency risk could become more significant. To date, we have not entered into any foreign currency exchange contracts and currently do not expect to enter into foreign currency exchange contracts for trading or speculative purposes.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Financial Statements

The financial statements required by this Item are set forth as a separate section of this Annual Report on Form 10-K. See Item 15 for a listing of financial statements provided in the section titled "Financial Statements."

Supplementary Data (Unaudited)

The following table sets forth unaudited supplementary quarterly financial data for the two year period ended January 31, 2019. In management's opinion, the unaudited data has been prepared on the same basis as the audited information and includes all adjustments necessary for a fair presentation of the data for the periods presented.

	For the Three Months Ended							
	Jan. 31, 2019	Oct. 31, 2018	Jul. 31, 2018	Apr. 30, 2018	Jan. 31, 2018	Oct. 31, 2017	Jul. 31, 2017	Apr. 30, 2017
	(in thousands, except per share data)							
Revenue	$51,070	$57,286	$62,474	$56,938	$70,575	$89,062	$71,630	$64,135
Cost of revenue	20,416	22,701	24,461	22,046	25,224	32,448	26,825	23,172
Gross profit	30,654	34,585	38,013	34,892	45,351	56,614	44,805	40,963
Operating expenses:								
Research and development	32,638	31,653	32,129	31,664	31,574	29,796	27,538	26,602
Selling, general and administrative	12,382	12,354	12,566	13,178	12,386	11,700	11,962	11,744
Total operating expenses	45,020	44,007	44,695	44,842	43,960	41,496	39,500	38,346
Income (loss) from operations	(14,366)	(9,422)	(6,682)	(9,950)	1,391	15,118	5,305	2,617
Other income, net	3,351	993	732	792	602	319	224	153
Income (loss) before income taxes	(11,015)	(8,429)	(5,950)	(9,158)	1,993	15,437	5,529	2,770
Provision (benefit) for income taxes	(6,472)	592	927	848	732	3,713	2,226	206
Net income (loss)	$(4,543)	$(9,021)	$(6,877)	$(10,006)	$1,261	$11,724	$3,303	$2,564
Net income (loss) per share attributable to ordinary shareholders:								
Basic	$(0.14)	$(0.28)	$(0.21)	$(0.30)	$0.04	$0.35	$0.10	$0.08
Diluted	$(0.14)	$(0.28)	$(0.21)	$(0.30)	$0.04	$0.34	$0.10	$0.07

Net income (loss) per ordinary share for the year is computed independently and may not equal the sum of the quarterly net income (loss) per ordinary share.

Effective February 1, 2018, we adopted Accounting Standards Codification ("ASC") Topic 606, Revenue from Contracts with Customers ("ASC 606") using a modified retrospective method with the cumulative effect recognized in

the beginning retained earnings. The quarterly financial data for the period ended January 31, 2019 were reported under Topic 606, whereas the quarterly financial data for the period ended January 31, 2018 were reported under Topic 605. See Note 2, "Revenue Recognition" of the Notes to Consolidated Financial Statements included in this report for more details.

Our quarterly revenues and operating results are difficult to forecast. Therefore, we believe that period-to-period comparisons of our operating results will not necessarily be meaningful, and should not be relied upon as an indication of future performance. Also, operating results may fall below our expectations and the expectations of analysts or investors in one or more future quarters. If this were to occur, the market price of our ordinary shares would likely decline. For further information regarding the quarterly fluctuation of our revenues and operating results, see Item 1A, “Risk Factors—Fluctuations in our operating results on a quarterly and annual basis could cause the market price of our ordinary shares to decline”.

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

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K. The term "disclosure controls and procedures" (as defined in Rules 13a- 15(e) and 15d- 15(e)) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Based upon such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of January 31, 2019, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15(d)-15(f) under the Exchange Act. The Company's internal control over financial reporting is 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. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. 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.

Management has evaluated the effectiveness of our internal control over financial reporting based on the framework in Internal Control-Integrated Framework (2013), issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Based on this evaluation, management has concluded that our internal control over financial reporting was effective as of January 31, 2019.

The effectiveness of our internal control over financial reporting as of January 31, 2019 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report, which appears herein.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during the Company's fiscal quarter ended January 31, 2019 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Inherent Limitations of Disclosure Controls and Internal Control over Financial Reporting

Because of their inherent limitations, our disclosure controls and procedures and our internal control over financial reporting may not prevent material errors or fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. The effectiveness of our disclosure controls and procedures and our internal control over financial reporting is subject to risks, including that the controls may become inadequate because of changes in conditions or that the degree of compliance with our policies or procedures may deteriorate.

ITEM 9B. OTHER INFORMATION

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of shareholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

We have a Code of Business Conduct and Ethics for all of our directors, officers and employees. We also have a Code of Ethics for Finance Team applicable to our Chief Executive Officer, Chief Financial Officer and other Senior Financial Officers. These documents are available on our website at http://investor.ambarella.com/corporate-governance. To date, there have been no waivers under our Code of Business Conduct and Ethics and Code of Ethics for Finance Team. We will post any amendments or waivers, if and when granted, of our Code of Business Conduct and Ethics and Code of Ethics for Finance Team on our website.

ITEM 11. EXECUTIVE COMPENSATION

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of shareholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

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

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of shareholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

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

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of shareholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information responsive to this item is incorporated herein by reference to our Proxy Statement for our 2019 annual meeting of shareholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a)(1) Financial Statements

The following consolidated financial statements of the Registrant and Report of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm, are included herewith:

(a)(2) Financial Statement Schedule

Financial statement schedules are omitted because they are not applicable or the required information is shown in the Financial Statements or the notes thereto.

(b) Exhibits

The exhibits listed below in the accompanying “Exhibits Index” are filed or incorporated by reference as part of this Annual Report on Form 10-K.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Ambarella, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Ambarella, Inc. and its subsidiaries (the “Company”) as of January 31, 2019 and 2018, and the related consolidated statements of operations, comprehensive income (loss), shareholders’ equity and cash flows for each of the three years in the period ended January 31, 2019, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of January 31, 2019, 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 January 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended January 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of January 31, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in fiscal year 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the

Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

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

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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