

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549**

FORM 10-K

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

For the fiscal year ended December 31, 2020

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: 000-30269

PIXELWORKS, INC.

(Exact name of registrant as specified in its charter)

Oregon

(State or other jurisdiction of incorporation or organization)

226 Airport Parkway, Suite 595

San Jose, California

(Address of principal executive offices)

91-1761992

(I.R.S. Employer Identification No.)

95110

(Zip Code)

408-200-9200

(Registrant's telephone number, including area code)

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

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

Trading Symbol(s)
PXLW

Name of each exchange on which registered
The 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 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 Section 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See 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

Non-accelerated filer

Emerging growth company

Accelerated filer

Smaller reporting company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. Yes No

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

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

The aggregate market value of the registrant's common stock held by non-affiliates at June 30, 2020 was \$115,004,218 based on the closing price of \$3.23 per share of common stock on the Nasdaq Global Market on June 30, 2020 (the last business day of the registrant's most recently completed second fiscal quarter). For purposes of this calculation, executive officers and directors are considered affiliates as well as holders of more than 5% of the registrant's common stock known to the registrant. This determination of affiliate status is not a conclusive determination for other purposes.

Number of shares of common stock of the registrant outstanding as of March 5, 2021: 52,212,421

Documents Incorporated by Reference

Part III incorporates information by reference to the registrant's definitive proxy statement, to be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2020.

SUMMARY RISK FACTORS

Our business is subject to varying degrees of risk and uncertainty. Investors should consider the risks and uncertainties summarized below, as well as the risks and uncertainties discussed in Part I, Item 1A, "Risk Factors" of this Annual Report on Form 10-K. Investors should also refer to the other information contained or incorporated by reference in this Annual Report on Form 10-K for the year ended December 31, 2020, including our consolidated financial statements and related notes, and our other filings made from time to time with the Securities and Exchange Commission. Our business operations could also be affected by factors that we currently consider to be immaterial or that are unknown to us at the present time. If any of these risks occur, our business, financial condition, and results of operations could be materially and adversely affected, and the trading price of our common stock could decline.

Our business is subject to the following principal risks and uncertainties:

- The ongoing effects of the COVID-19 pandemic could disrupt our business or the business of our customers or suppliers, and as such, may adversely affect our financial condition.
- The continued uncertain global economic environment and volatility in global credit and financial markets could materially and adversely affect our business and results of operations.
- If we fail to meet the evolving needs of our markets, identify new products, services or technologies, or successfully compete in our target markets, our revenue and financial results will be adversely impacted.
- Our product strategy may not address the demands of our target customers and may not lead to increased revenue in a timely manner or at all, which could materially adversely affect our results of operations and limit our ability to grow.
- Achieving design wins involves lengthy competitive selection processes that require us to incur significant expenditures prior to generating any revenue or without any guarantee of any revenue related to this business. If we fail to generate revenue after incurring substantial expenses to develop our products, our business and operating results would suffer.
- If we fail to retain or attract the specialized technical and management personnel required to successfully operate our business, it could harm our business and may result in lost sales and diversion of management resources.
- We have significantly fewer financial resources than most of our competitors, which limits our ability to implement new products or enhancements to our current products, which in turn could adversely affect our future sales and financial condition.
- If we are not profitable in the future, we may be unable to continue our operations.
- A significant amount of our revenue comes from a limited number of customers and distributors exposing us to increased credit risk and subjecting our cash flow to the risk that any of our customers or distributors could decrease or cancel its orders.
- We generally do not have long-term purchase commitments from our customers and if our customers cancel or change their purchase commitments, our revenue and operating results could suffer.
- Our revenue and operating results can fluctuate from period to period, which could cause our share price to decline.
- If we are unable to generate sufficient cash from operations and are forced to seek additional financing alternatives our working capital may be adversely affected and our shareholders may experience dilution or our operations may be impaired.
- We license our intellectual property, which exposes us to risks of infringement or misappropriation, and may cause fluctuations in our operating results.
- We face a number of risks as a result of the concentration of our operations and customers in Asia.
- Our operations in Asia expose us to heightened risks due to natural disasters.
- We face additional risks associated with our operations in China and our results of operations and financial position may be harmed by changes in China's political, economic or social conditions or changes in U.S.-China relations.
- Our international operations expose us to risks resulting from the fluctuations of foreign currencies.
- If we are unable to maintain effective disclosure controls and internal controls over financial reporting, investors may lose confidence in the accuracy and completeness of our financial reports, and the market price of our common stock may be materially and adversely affected.
- Our dependence on selling to distributors and integrators increases the complexity of managing our supply chain and may result in excess inventory or inventory shortages.
- We may be unable to successfully manage any future growth, including the integration of any acquisition or equity investment, which could disrupt our business and severely harm our financial condition.
- Continued compliance with regulatory and accounting requirements will be challenging and will require significant resources.
- Regulations related to conflict minerals may adversely impact our business.
- Dependence on a limited number of sole-source, third-party manufacturers for our products exposes us to possible shortages based on low manufacturing yield, errors in manufacturing, uncontrollable lead-times for manufacturing, capacity allocation, price increases with little notice, volatile inventory levels and delays in product delivery, any of which could result in delays in satisfying customer demand, increased costs and loss of revenue.

- Our highly integrated products and high-speed mixed signal products are difficult to manufacture without defects and the existence of defects could result in increased costs, delays in the availability of our products, reduced sales of products or claims against us.
- The development of new products is extremely complex and we may be unable to develop our new products in a timely manner, which could result in a failure to obtain new design wins and/or maintain our current revenue levels.
- Intense competition in our markets may reduce sales of our products, reduce our market share, decrease our gross profit and result in large losses.
- If we are not able to respond to the rapid technological changes and evolving industry standards in the markets in which we compete, or seek to compete, our products may become less desirable or obsolete.
- We use a customer-owned tooling process for manufacturing most of our products, which exposes us to the possibility of poor yields and unacceptably high product costs.
- We depend on manufacturers of our semiconductor products not only to respond to changes in technology and industry standards but also to continue the manufacturing processes on which we rely.
- Shortages of materials used in the manufacturing of our products and other key components of our customers' products may increase our costs, impair our ability to ship our products on time and delay our ability to sell our products.
- Because of our long product development process and sales cycles, we may incur substantial costs before we earn associated revenue and ultimately may not sell as many units of our products as we originally anticipated.
- Our developed software may be incompatible with industry standards and challenging and costly to implement, which could slow product development or cause us to lose customers and design wins.
- The competitiveness and viability of our products could be harmed if necessary licenses of third-party technology are not available to us on terms that are acceptable to us or at all.
- Our limited ability to protect our IP and proprietary rights could harm our competitive position by allowing our competitors to access our proprietary technology and to introduce similar products.
- Our products are characterized by average selling prices that can decline over relatively short periods of time, which will negatively affect our financial results unless we are able to reduce our product costs or introduce new products with higher average selling prices.
- The cyclical nature of the semiconductor industry may lead to significant variances in the demand for our products and could harm our operations.
- The price of our common stock has and may continue to fluctuate substantially.

PIXELWORKS, INC.
FORM 10-K
FOR THE YEAR ENDED DECEMBER 31, 2020

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NOTE REGARDING COVID-19

In March 2020, the World Health Organization declared the COVID-19 outbreak a pandemic, and the virus continues to spread in areas where we operate and sell our products and services. Several public health organizations have recommended, and many local governments have implemented, certain measures to slow and limit the transmission of the virus, including shelter in place and social distancing ordinances, which has resulted in a significant deterioration of economic conditions in many of the countries in which we operate.

The spread of COVID-19 has caused us to modify our business practices, including implementing work-from-home policies and restricting travel by our employees. Our China offices were the first to be impacted, but as our China team slowly came back from the COVID-19 disruption, we enabled all critical functions, from integrated circuit development to sales to algorithm and software development, to work remotely through virtual workspaces. Our Shanghai and Shenzhen offices are at full staffing. Our offices and supply chain partners in Taiwan are fully functional and have not gone on lock down. As of today, our offices in Japan and North America are currently operating in office and remotely and are fully functional.

COVID-19 may also affect the operations of our suppliers and customers, as their own workforces and operations are disrupted by the pandemic, which could result in the interruption of our distribution system, temporary or long-term disruption in our supply chains, or delays in the delivery of our product. While we expect the impacts of COVID-19 to be temporary, the disruptions caused by the virus have negatively affected our revenue and results of operations in 2020. For example, our revenues for fiscal year 2020 were lower than initially anticipated at the beginning of the year and travel restrictions and border closures have had a material impact on our ability to achieve our business goals.

In response to the outbreak of COVID-19, we have taken the following measures to date:

- Implemented work-from-home and social distancing policies throughout our organization
- Suspended all company travel other than business critical travel within China

Additionally, in preparation for a potentially prolonged economic recovery, in 2020 we took the following cost-saving measures:

- Our Chief Executive Officer and the Chief Financial Officer have taken a 10% base salary reduction
- Our Board of Directors agreed to take Restricted Stock Units (RSUs) in lieu of their director fees for the full year of 2020
- Our Executive staff reduced their base salary by 10% in exchange for RSUs
- The Executive Bonus Program for 2020 was eliminated
- Annual Merit increases for all employees were delayed by one quarter
- Hiring was put on hold other than a few critical hiring requisitions
- For the second and third quarter, all employees were given the opportunity to exchange up to 10% of their quarterly base salary for RSUs
- We adopted a restructuring plan that resulted in an approximately 14% reduction in our workforce

The impact of the pandemic on our business, as well as the business of our suppliers and customers, and the additional measures that may be needed in the future in response to it, including additional cost-saving measures, will depend on many factors beyond our control and knowledge. We will continually monitor the situation to determine what actions may be necessary or appropriate to address the impact of the pandemic, which may include actions mandated or recommended by federal, state or local authorities.

Forward-looking Statements

This Annual Report on Form 10-K, including Management's Discussion and Analysis of Financial Condition and Results of Operation in Part II, Item 7, contains "forward-looking statements" that are based on current expectations, estimates, beliefs, assumptions and projections about our business. Words such as "expects," "anticipates," "intends," "plans," "believes," "seeks," "estimates" and variations of such words and similar expressions are intended to identify such forward-looking statements. These statements are not guarantees of future performance and involve numerous risks, uncertainties and assumptions that are difficult to predict. These forward-looking statements include statements regarding: the features, benefits and applications of our technologies and products; market trends and changes, including in the video consumption, mobile, video and digital projection markets; our strategy, including regarding our products, technology, research and development, sales and marketing and acquisition and other growth opportunities; our expectations with respect to our restructuring plans; amortization expectations; the sufficiency of our working capital and need for, or ability to secure, additional financing; the success of our products in expanded markets; customer, distributor and manufacturer concentration; current global economic challenges; exchange rate risk; our competitive advantages in research and development; levels of inventory at distributors and customers; changes in customer ordering patterns or lead times; seasonality; expectations as to revenue associated with sales into certain markets in 2020; cost expectations; backlog; future contractual obligations; competition; intellectual property; insufficient, excess or obsolete inventory and variations in inventory valuation; income tax valuation allowance; net operating loss utilization; changes in accounting principles; and internal controls. Factors which may cause actual results to vary materially from those contained in the forward-looking statements include, without limitation: our ability to deliver new products in a timely fashion; our new product yield rates; changes in estimated product costs; product mix; restructuring charges; the growth of the markets we serve; supply of products from third-party foundries; failure or difficulty in achieving design wins; timely customer transition to new product designs; competitive factors, such as rival chip architectures, introduction or traction by competing designs, or pricing pressures; litigation related to our intellectual property rights; our limited financial resources; economic and political challenges due to operations in Asia; exchange rate fluctuations; failure to retain or attract qualified employees; the sufficiency of our intellectual property and patent portfolio; fluctuations in foreign currencies; natural disasters; the need for additional income tax valuation allowances; limitations on net operating losses, as well as other risks identified in the risk factors contained in Part I, Item 1A of this Annual Report on Form 10-K. These forward-looking statements speak only as of the date on which they are made, and we do not undertake any obligation to update any forward-looking statement to reflect events or circumstances after the date of this Annual Report on Form 10-K. If we do update one or more forward-looking statements, you should not conclude that we will make additional updates with respect thereto or with respect to other forward-looking statements. Except where the context otherwise requires, in this Annual Report on Form 10-K, the terms "Pixelworks," the "Company," "we," "us" and "our" mean Pixelworks, Inc., an Oregon corporation, and its wholly-owned subsidiaries.

PART I

Item 1. Business.

Overview

Pixelworks is a leading provider of high-performance and power-efficient visual processing solutions that bridge the gap between video content formats and rapidly advancing display capabilities. We develop and market semiconductor and software solutions that enable consistently high-quality, authentic viewing experiences in a wide variety of applications from cinema to smartphones. Our primary target markets include Mobile (smartphone, gaming and tablet), Home Entertainment (TV, personal video recorder ("PVR"), over-the-air ("OTA") and projector), Content (creation, remastering and delivery), and Business & Education (projector).

We were one of the first companies to commercially launch a video System on Chip ("SoC") capable of deinterlacing 1080i HDTV signals and one of the first companies with a commercial dual-channel 1080i deinterlacer integrated circuit. Our Topaz product line was one of the industry's first single-chip SoC for digital projection. We first introduced our motion estimation / motion compensation technology ("MEMC") for TVs and in recent years introduced a mobile-optimized MEMC solution for smartphones, one of several unique features in our mobile-optimized X5 visual processor. In 2019, we introduced our Hollywood award-winning TrueCut® video platform, the industry's first motion grading technology that allows fine tuning of motion appearance in cinematic content for a wide range of frame rates, shutter angles and display types.

Our solutions enable worldwide manufacturers to offer leading-edge consumer electronics and professional display products, as well as video delivery and streaming solutions for content service providers. Our core visual display processing technology intelligently processes digital images and video from a variety of sources and optimizes the content for a superior viewing experience. Our video coding technology reduces storage requirements, significantly reduces bandwidth constraint issues and converts content between multiple formats to enable seamless delivery of video, including OTA streaming, while also maintaining end-to-end content security.

Rapid growth in video and gaming consumption, combined with the move towards high frame rate / refresh rate displays, especially in mobile, is increasing the demand for our visual processing and video delivery solutions. Our technologies can be applied to a wide range of devices from large-screen projectors to cinematic big screens, to low-power mobile tablets, smartphones, high-quality video infrastructure equipment and streaming devices. Our products are architected and optimized for power, cost, bandwidth, and overall system performance, according to the requirements of the specific application. On occasion, we have also licensed our technology.

As of December 31, 2020, we held an intellectual property portfolio of 338 patents related to the visual display of digital image data. We focus our research and development efforts on developing video algorithms that improve quality, and architectures that reduce system power, cost, bandwidth and increase overall system performance and device functionality. We seek to expand our technology portfolio through internal development and co-development with business partners, and we continually evaluate acquisition opportunities and other ways to leverage our technology into other high-value markets.

Key Markets

We target four key market segments with our products and solutions including:

Market	Products
Mobile (Smartphone, Gaming, Tablet)	Visual processors and software
Home Entertainment (TV, PVR, OTA, Projector)	XCode® transcoding solutions and visual processors
Content (Creation, Remastering, Delivery)	TrueCut® platform for content creators/video providers
Business and Education (Projectors)	Visual processors

Bridging the Performance Gap Between Content Formats and Device Capabilities

In recent years, display refresh rates for TVs, tablets and smartphones have been advancing faster than the ability of content formats to keep up. The refresh rate, measured in Hertz ("Hz"), is the number of times per second the display updates the image on screen to convey motion. Today, TV displays generally have a refresh rate of 120 Hz, while smartphones are now moving from 60 to 90 and 120 Hz. Despite this trend, the vast majority of produced video content exists only in 24-25 frames per second ("FPS"), while most gaming and user generated content is at 30 FPS. While frame rates for new game content is on the rise, the rendering, compute and thermal limits of today's mobile processors often limit the effective frame rates to well below 60 FPS. The resulting mismatch between low frame rate content and high refresh rate screens creates artifacts, such as judder and strobing, that degrade video quality and destroy creative intent. The trend towards brighter, high dynamic range ("HDR") capable screens make these artifacts more noticeable to viewers. Visual quality is further impeded by power constraints and changes in ambient lighting, particularly in mobile devices.

Our technologies and solutions efficiently bridge the quality gap and enable the visual storytelling that is richer and true to creative intent. In fact, our TrueCut Motion Grading is the industry's first solution to give filmmakers the ability to cinematically fine-tune motion blur, judder and frame-rate appearance and is used as part of the creative process to empower filmmakers to shoot at any frame-rate, then deliver a cinematically tuned, broader set of motion and frame rate appearances. While TrueCut technology enables creation of new content or remastering of existing content that preserves artistic intent across screens, from cinema to home TVs to smartphones, our mobile display processors and software bridge the quality gap for all existing content viewed on mobile devices, such as smartphones and tablets.

Display Trends

Display technologies have recently begun to transition from an era of higher resolutions, response times and frame rates, with lower power and thinner form factors, to one focused on higher contrast, brightness and more colors.

In mobile devices, Apple Inc. has brought wide color gamut to many of their devices including the iPhone, iPad Pro, MacBook Pro and iMac. These devices deliver the same color gamut used in digital cinema theatres ("DCI-P3"). Meanwhile, TV manufacturers including Samsung, Sony and LG are bringing high contrast, high brightness or HDR TVs based on organic light emitting diodes ("OLED") and local-dimming liquid crystal display ("LCD") panels to the living room. Furthermore, some premium and mid-tier smartphones and tablets from Apple, Samsung, Sony, LG and Huawei now include HDR as a standard feature.

Hardware improvements in color and contrast are of little value without content that can take advantage of them. In fact, a significant gap now exists between the vast majority of video content available to consumers and these emerging display devices.

- **Contrast and Brightness:** Almost all movies available to consumers today use the "Rec.709" ITU standard format. This format defines brightness levels up to around 100 "nits" (a standard measure of brightness), whereas HDR TVs are five to ten times brighter, from 540 nits upwards. Most mobile devices support over 400 nits and sometimes over 600 nits.
- **Color Gamut:** DCI-P3 has a 25% larger color gamut than Rec.709.
- **Frame Rate:** TVs commonly display at 120 frames per second (120 Hz) and up to 240 Hz on more sophisticated higher-end models. Many premium tier mobile displays were launched in 2020 with 120 Hz screens, which are quickly cascading down to lower price points. Some of the gaming smartphones now have displays that run at up to 144 Hz.
- **Resolution:** TVs have achieved 4k resolutions (3840x2160) and mobile devices today can achieve up to 3440x1440 resolution, and while some content is available in 4k resolution, most movies are only available in FHD or HD resolutions, which is typically 1920x1080 and 1280x720 respectively.

This gap between display capabilities and available content brings significant challenges to video display device manufacturers. Sophisticated video processing is required to accurately reproduce the intended video on today's displays. We help bridge this gap between the display capabilities and available content with our visual processors and software and TrueCut® video platform for content creators and video providers.

Content formats are evolving to take advantage of these display improvements. For example, Dolby introduced the "Dolby Vision™" format for movies and devices, in order to allow consumers to realize the benefits of HDR and wide color gamut. The industry standards body Society of Motion Picture & Television Engineers released a format specification known as "HDR10" that similarly bridges the gap in contrast and color between content and devices. The Ultra-HD Blu-ray disk format

and streaming services such as Netflix and Amazon Video now support 4k HDR, aided by improved compression standards such as H.265.

Managing many content formats across a rapidly evolving range of displays is a significant and growing challenge. Older content tends to not get upgraded to the newer formats, yet consumers expect all content to display correctly. As the number of content formats grow, the technology of video processing becomes increasingly complex.

Delivering the intent of the content creator requires sophisticated algorithms and hardware circuits. Frame-rate and motion incompatibilities require a significantly higher level of processing and more sophisticated algorithms in order to avoid creating new problems. Most TVs today include frame-rate conversion chips, but many reviewers complain about artifacts such as halos, breakup in the image and the so-called "soap opera effect". Unfortunately, without frame-rate conversion, the video can appear to have judder and blur at levels that have increased substantially as a result of the improvements in contrast, color and detail.

In addition to judder, high-resolution displays suffer from softness and smearing in motion sequences called motion blur. There are numerous causes of motion blur. The materials used in constructing pixels on the display take a finite amount of time to transition from one state to another. If this time is too long, the image does not update swiftly and motion sequences seem to smear or blur. For example, Hollywood movies, TV shows and other premium content are usually authored at 24 frames per second or 24 Hz. At this frame rate, the brain can easily notice the transition from one frame to the next. As the brain and eyes track objects in motion, they have to jump in discrete steps due to the low frame rate. This stop-start motion is perceived by the brain as motion blur, reducing the visible clarity and fidelity of objects in motion. Additionally, when a motion sequence is played on a digital display device, the new updated frame is drawn over the top of the still visible previous frame. This "hold" effect is perceived by the brain as blur.

Judder and motion blur artifacts are more noticeable on high contrast, wider gamut displays, regardless of screen size (for example, a 5-inch smartphone screen viewed from ten inches away appears to be the same size as a 60-inch large screen TV viewed from ten feet away). Our advanced video display processing provides original equipment manufacturers ("OEMs") with solutions that avoid or minimize these artifacts and help realize the potential of their investment in high-resolution displays. We believe the most effective method for removing both judder and reducing blur is MEMC technology. This technology is based on complex mathematical algorithms that insert additional, interpolated frames to create a new, faster sequence of frames that has smooth, continuous motion. This technique works for virtually all types of panel technology.

Video Consumption Trend

With the advent of digital video, it has become possible to deliver video to consumers in an ever-increasing number of ways. Traditional delivery mechanisms, such as over the air broadcasts, cable, satellite, DVDs and Blu-ray, are being supplemented with Internet streaming and download services. With these new video delivery options comes the ability to offer more services and improved quality.

According to recent studies by Cisco Systems, Inc. ("Cisco"), video will constitute 82% of all global consumer Internet traffic by 2022. Global IP video traffic and Internet video traffic will both grow four-fold from 2017 to 2022. Live Internet video will account for 17 percent of Internet video traffic by 2022. Live video will grow 15-fold from 2017 to 2022. This rapid increase in video consumption is being driven by a variety of connected digital video devices and applications that allow consumers to easily create, share and consume video. In particular, mobile video consumption is rapidly expanding. The "always on" and ease of use of mobile devices are helping to make them the preferred choice as the "first screen" for many consumers.

As more content becomes increasingly available via the Internet, consumers have more choices for how and where they can enjoy content. According to Cisco, by 2022 there will be 9.4 billion connected mobile devices across the globe.

Video and Gaming Market for Mobile Devices

Mobile devices have become the dominant driver of video consumption and growth. According to the Q3 2019 Global Video Index report from Brightcove, Inc., more than 62% of all video views are now on mobile devices. Video also continues to grow as a share of mobile traffic usage. According to the June 2020 Ericsson Mobility Report, video now constitutes 63% of global mobile traffic and will rise to a 76% share by 2025. The burgeoning global gaming market is dominated by the smartphone segment, with 2.5 billion users, according to NewZoo1, a leading market intelligence service covering gaming, mobile and eSports. In China alone, the number of mobile gamers is expected to reach 637 million with revenue of \$32 billion by 2024, compared to \$18.5 billion in 2019 – implying 73% growth over five years, according to Niko Partners' May 2020 report, China Mobile Games Market.

Mobile display systems pose a number of unique challenges. Power is of primary importance, impacting form factor, cost and performance. As these systems have added more functionality, new features have had to compete for battery life, internal bandwidth and space. The addition of high-resolution displays has further increased the burden on these resources.

Using the same technology developed for large screen TVs is neither feasible nor desirable. The video display processing pipelines used in TVs consume many watts of power and would be unsuitable for battery powered systems. In TVs, the size constraints on electronics are significantly less stringent when compared to mobile systems. To furnish the mobile market with appropriate solutions, we have taken a holistic, system-wide view and re-invented its video display processing technology to fit within the mobile constraints of battery life, bandwidth, form factor and performance. This approach has enabled us to create technology that meets the power and size requirements of mobile as well as offering additional benefits such as reducing the bandwidth burden of high-resolution video and freeing up more bandwidth for the CPU and GPU.

The mobile market today is primarily comprised of smartphones and tablets. Our technology addresses both of these markets.

- **Smartphones.** Smartphones have become a popular choice for many consumers. International Data Corporation ("IDC") estimates that 1.52 billion smartphones will be sold in 2023. The resolution of smartphone displays is growing, while the color gamut and contrast is moving toward DCI-P3 and HDR. These improvements in displays actually exacerbate the quality issues of video playback, a growing problem as users increasingly use their smartphones as their primary form of video consumption.
- **Tablets.** The line between tablets and smartphones is becoming increasingly indistinct as more tablets are offering mobile connectivity and are now available in sizes similar to those of smartphones. Tablets offer broad appeal to consumers. With the display being the salient component of smartphones and tablets, and the rapidly increasing use of these devices for video consumption, we believe that the incorporation of video display processing is the next logical step.

As 5G network coverage rapidly expands worldwide, the availability of 5G chipsets targeting smartphones priced as low as \$200 in 2021, should reinvigorate market growth given the increased speed and lower latency of the wireless connections. According to Counterpoint Research, 14% of smartphones sold in the U.S. in August 2020 included 5G connectivity. In a recent 2020 report, IDC projected the smartphone market to return to a full recovery by 2022 and that 5G smartphones would capture a 50% global share of shipments by 2023. In addition, service providers in some countries will also utilize 5G networks to provide fixed wireless broadband. We further believe our compelling mobile display processing functionality, combined with 5G capability, will help motivate consumers to replace their 3G and 4G phones at a faster rate than occurred in the past two years. Finally, a new smartphone category has emerged as top vendors have previewed foldable smartphones which serve as a phone, and a mini tablet when unfolded. As prices for this capability inevitably come down, and further competition emerges, we believe this new category, along with the rollout of 5G networks, can strengthen the mobile device market.

Business and Education Market for Digital Projectors

Increasingly affordable price points are driving continued adoption of digital projectors in business and education, as well as among consumers. Technology improvements are helping to reduce the size and weight of projection devices while increasing their performance. Projector models range from larger units designed to be permanently installed in a conference hall or other venue, to ultra-portable devices weighing fewer than two pounds for maximum portability. According to PMA Research Limited, the worldwide front projector market shipped 9.8 million units in 2019 and is forecasted to reach 11.6 million units by 2023.

The feature set of projection systems differs from that of a typical large-screen flat panel display such as a TV. This is primarily because the projector is a sharing and collaboration device while the TV is designed for direct consumption of content.

The front projection market serves several different areas such as business, education and home theater. Business users employ multimedia projectors to display both still and video presentation materials from PCs and other sources. Requirements for the business market include portability, compatibility with multiple software and hardware applications, and features that ensure simple operation. In education environments ranging from elementary schools to university campuses, projectors help teachers integrate media-rich instruction into classrooms. Home theater projector systems can drive large-screen displays for content consumption where flat panel displays are either economically not viable or physically incompatible for use.

Consistent with the trends of other consumer products, digital projectors are increasingly incorporating networking capabilities that enable the sharing of video and other content among multiple devices. This, in turn, is enabling new use models for digital projection in both the education and business environments. For example, one teacher can present the same material simultaneously in multiple classrooms, and students in different classrooms can display and discuss their work. Such connectivity allows instant access to content and sharing of content, which promotes interaction and collaboration among dispersed groups. In the business setting, this connectivity enables teleconferencing and the seamless sharing of content for more effective meetings.

Video Delivery Market for Home Entertainment

With the acquisition of ViXS Systems Inc. in August 2017, we expanded both our market presence and product portfolio. The video industry continues to evolve and adopt new video standards such as High Efficiency Video Coding, 4K Ultra HD and HDR. The technical and processing demands of these standards are complex and play directly into our core competencies. Our technologies for video delivery are highly integrated, low power and provide high quality video processing, allowing seamless connectivity between devices while maintaining end-to-end content security.

The home entertainment sub-markets that we address with our video delivery products include:

- **Consumer Products** - OEMs and Original Design Manufacturers ("ODMs") design products for the consumer electronics segments.
- **OTA** - Over the Air applications for single, dual, and quad streaming requirements. End users who want to either "cut the cord" or supplement their service offerings.
- **IP Streaming** - Network streaming devices capable of content portability, and support for your own screen (phone and tablet devices), deployed by service operators.

Consumer Products

High-resolution (UHD/4K), sustained bitrate decoding (100Mbit) and advanced video formats (HDR10, HDR10+) are key requirements for advanced personal video recorder ("PVR") products sold in the Japanese market, where the end consumers rate video quality as a key acquisition criteria. This advanced PVR market in Japan is experiencing growth as products move from 2K to UHD/4K formats. In addition, as the market introduces new broadcast technologies, like Advanced Digital Satellite Broadcast ("ADSB") in Japan, and ATSC 3.0 in Korea and North America, there are further growth opportunities in this market segment.

OTA

Subscribers to video content in the home are making changes and demanding choices. While content is freely available, if it is distributed over an operator network, or even simply over IP, there is a monthly re-transmit fee that is charged to the consumer. As the number of video subscribers to services such as cable TV has been declining, the monthly re-transmit fee has been increasing. These fee increases are leading more consumers to 'cut the cord' and replace their TV subscriptions with over the top ("OTT") video services and free OTA broadcast television. As part of their OTA experience, consumers are starting to require multiple stream support of concurrent channels, so various devices can view different channels at the same time.

IP Streaming

Related to OTA applications, the service operators that want to provide their own choice to their video subscribers are taking advantage of our IP Streaming applications. These re-use common platforms, and connect to the in-home infrastructure, either at the set top box level, or the Wi-Fi router level. This provides a centralized place where the management, and distribution of content can occur.

For service operators, the benefits are:

- Customer retention
- Reduced use of network bandwidth for free OTA channels

For consumers, the benefits are:

- One menu that provides aggregation of Linear, Video-on-Demand, OTT, and OTA content
- Reduced monthly fees related to lower re-transmission fees

Core Technologies and Products

We have developed a portfolio of advanced video algorithms and IP to address a broad range of challenges in digital video. We believe our technologies can significantly improve video quality and will become increasingly important as the popularity of video content consumption grows, and pixel densities, screen size and image quality increase. Our products are designed with a flexible architecture that allows us to combine algorithms and functional blocks of digital and mixed signal circuitry. Accordingly, our technologies can be implemented across multiple products, in combinations within single products and can be applied to a broad range of applications including smartphones, tablets, and projectors. The majority of our products include one or more technologies to provide optimal high-quality video display processing solutions to our customers, regardless of screen size.

Our core Video Display Processing technologies include:

- **MotionEngine® MEMC.** Our proprietary MEMC technology significantly improves the performance and viewing experience of any screen by addressing problems such as judder and motion blur. Unlike competitive solutions it also reduces halo effects that are a byproduct of MEMC. Halos are objectionable blurred regions that surround moving objects as the MEMC algorithms try to reconstruct missing image data caused by the concealing and revealing of objects as they pass over or behind one another. Removing halos dramatically improves image quality and is of particular importance on high-resolution displays where artifacts become more visible.
- **AI Based Display Processing.** The Pixelworks i6 processor dramatically improves video and image quality and sets a new standard for picture quality on both LCD and OLED mobile displays with a new AI-driven architecture and dynamic refresh rate support for up to 144 Hz. Its lightweight AI display inferencing augments the Company's knowledge base, numerous real time inputs and fuzzy logic IP to adaptively and intelligently optimize overall picture quality for video, games and photos at low power, including real time SDR-to-HDR conversion and AI adaptive display.
- **Advanced Scaling.** As display resolutions continue to increase, there is a need to convert lower resolution content to higher resolution in order to display content properly. With the latest wave of high-resolution displays, the quality and quantity demands of scaling have increased significantly. Artifacts become more noticeable on these types of displays as they distract from the realism effect. In addition, with the availability of high-resolution content lagging behind the availability of high-resolution displays, high-quality scaling is required to ensure high resolution displays do not suffer when compared to Full-HD displays of the same size. Our advanced scaling is designed to ensure that up-conversion of lower resolution content is of the highest quality in maintaining the fidelity of image.
- **Mobile Video Display Processing.** We have developed innovative video display processing solutions that are designed to optimize power consumption for mobile devices. Beyond MEMC and advanced scaling, these mobile solutions provide the kind of improvements in color, contrast, sharpness and de-blur that are currently only found in high quality TVs today. Furthermore, this technology can reduce system power consumption and extend battery life.
- **Transcoding/Decoding.** Digital Delivery forms the bulk of not just video content, but all internet bandwidth today. However, throughout the entire chain from inception to consumption, there are multiple variations in bitrate, resolution, and codecs used for both audio and video. Transcoding is a fundamental technology used throughout this pipeline that leads to moving pictures viewed on TVs and mobile devices. The XCODE family of ASICs has enabled many devices within this pipeline, from the racks in some service providers all the way down to the home user watching broadcast OTA TV on a smartphone. XCODE technology provides solutions that deliver UHD Blu-ray PVRs with capability of transcoding recorded content suitable for viewing on smartphones. The technology supports today's broadcast standards, such as ATSC 1.0, DVB/T/T2/S/S2, ISDB/T/S, and ADSB and is scalable to support upcoming broadcast standards such as ATSC 3.0.
- **SDR to HDR Conversion.** UHD video has standardized on a technology known as HDR to deliver higher dynamic range content. This has resulted in several competing HDR deployments like HDR10, HLG and HDR10+ with support by multiple industry giants. Our HDR conversion technology can not only convert between SDR (Standard Dynamic Range) and HDR10, it can also convert among HDR10, HLG and HDR10+ solving an interconnectivity problem between content formatted in one HDR format to Display devices that supports a different HDR standard.

Our product development strategy is to leverage our expertise in video display processing to address the evolving needs of our target markets. We plan to continue to focus our development resources to maintain our position in these markets by providing leading edge solutions for the advanced digital projection and video delivery markets and to enhance our video processing solutions for mobile markets. We deliver our technology in a variety of offerings, which take the form of single-purpose chips, highly integrated SoCs that incorporate specialized software, full solutions incorporating software and other tools and IP cores that allow our technology to be incorporated into third party solutions.

Our primary video display processor product categories include the following:

- **ImageProcessor ICs.** Our ImageProcessor ICs include embedded microprocessors, digital signal processing technology and software that control the operations and signal processing within high-end display systems. ImageProcessor ICs were our first product offerings and continue to comprise the majority of our business. We have continued to refine the architectures for optimal performance, manufacturing our products on process technologies that align with our customers' requirements. Additionally, we provide a software development environment and operating system that enables our customers to more quickly develop and customize the "look and feel" of their products.

- **Video Co-Processor ICs.** Products in this category work with an image processor to post-process video signals to enhance the performance or feature set of the overall video solution (for example, by significantly reducing judder and motion blur). Our Video Co-Processor ICs can be used with our ImageProcessor ICs or with image processing solutions from other manufacturers, and in most cases can be incorporated without assistance from the supplier of the base image processor. This flexibility enables manufacturers to augment their existing or new designs to enhance their video display products.
- **Transcoder ICs.** Our Transcoder ICs include embedded microprocessors, digital signal processing technology and software that control the operations and signal processing for converting multiple bitrates, resolutions and codecs to provide bandwidth efficient video transmissions based on industry standard protocols. Our transcoder technology allows for single, dual and even quad streaming solutions for OTA products. Like our other ICs, we have continued to refine the architectures for optimal performance, manufacturing our products on process technologies that align with our customers' requirements. Additionally, we provide a software development environment that enables our customers to more quickly develop and customize their products.

Customers, Sales and Marketing

The key focus of our global sales and marketing strategy is to achieve design wins with industry leading branded manufacturers in our target markets and to continue building strong customer relationships. Once a design win has been achieved, sales and marketing efforts are focused on building long-term mutually beneficial business relationships with our customers by providing superior technology and reducing their costs, which complements our customers' product development objectives and meets their expectations for price-performance and time to market. Marketing efforts are focused on building market-leading brand awareness and preference for our solutions.

We utilize direct sales and marketing resources in China, Japan, Taiwan, and the U.S. as well as indirect resources in several regions. In addition to sales and marketing representatives, we have field application engineers who provide technical expertise and assistance to manufacturing customers on final product development.

Our global distribution channel is multi-tiered and involves both direct and indirect distribution channels, as described below:

- **Distributors.** Distributors are resellers in local markets who provide engineering support and stock our semiconductors in direct relation to specific manufacturing customer orders. Our distributors often have valuable and established relationships with our end customers, and in certain countries it is customary to sell to distributors. While a distributor's payment to us is not dependent upon the distributor's ability to resell the product or to collect from the end customer, our distributors may provide longer payment terms to end customers than those we would offer. Sales to distributors accounted for 49% and 44% of revenue in 2020 and 2019 respectively.

Our largest distributor, Tokyo Electron Device Ltd. represented more than 10% of revenue in each of 2020 and 2019, and accounted for more than 10% of accounts receivable as of December 31, 2019. Another distributor, Upstar Technology Limited accounted for more than 10% of accounts receivable as of December 31, 2020 and 2019. No other distributor accounted for more than 10% of revenue in 2020 and 2019 or represented more than 10% of accounts receivable as of December 31, 2020 or 2019.

We have distributor relationships in Japan, China, Europe, Korea, Southeast Asia, Taiwan and the U.S.

- **Direct Relationships.** We have established direct relationships with companies that manufacture high-end display systems. Some of our direct relationships are supported by commission-based manufacturers' representatives, who are independent sales agents that represent us in local markets and provide engineering support but do not carry inventory. Revenue through direct relationships accounted for 51% and 56% of total revenue in 2020 and 2019, respectively.

We have direct relationships with companies falling into the following three classifications:

- **Integrators.** Integrators are OEMs who build display devices based on specifications provided by branded suppliers.
- **Branded Manufacturers.** Branded manufacturers are globally recognized manufacturers who develop display device specifications and manufacture, market and distribute display devices either directly or through resellers to end-users.
- **Branded Suppliers.** Branded suppliers are globally recognized suppliers who develop display device specifications and then source them from integrators, typically in Asia, and distribute them either directly or through resellers to end-users.

Revenue attributable to our top five end customers together represented 58% and 77% of revenue in 2020 and 2019, respectively. End customers include customers who purchase directly from us as well as customers who purchase products indirectly through distributors. Sales to Seiko Epson Corporation represented more than 10% of revenue in each of 2020 and 2019, and accounted for more than 10% of accounts receivable as of December 31, 2020 and 2019. Sales to Sharp Corporation represented more than 10% of revenue in 2019. No other end customer accounted for more than 10% of revenue in 2020 and 2019 or represented more than 10% of accounts receivable as of December 31, 2020 or 2019.

Seasonality

Our business is subject to seasonality related to the markets we serve and the location of our customers. For example, we have historically experienced higher revenue from the digital projector market in the third quarter of the year, and lower revenue in the first quarter of the year, as our Japanese customers reduce inventories in anticipation of their March 31 fiscal year end.

Geographic Distribution of Sales

Sales outside the U.S. accounted for approximately 93% and 95% of revenue in 2020 and 2019 respectively.

Financial information regarding our domestic and foreign operations is presented in "Note 13: Segment Information" in Part II, Item 8 of this Annual Report on Form 10-K.

Backlog

Our sales are made pursuant to customer purchase orders for delivery of standard products. The volume of product actually purchased by our customers, as well as shipment schedules, are subject to frequent revisions that reflect changes in both the customers' needs and product availability. In light of industry practice and our own experience, we do not believe that backlog as of any particular date is indicative of future results.

Competition

The semiconductor industry is intensely competitive. Further, the markets for higher performance display and projection devices, including the markets for mobile devices, digital projectors and other applications demanding high quality video, are characterized by rapid technological change, evolving industry standards, compressed product life cycles and declining average selling prices. We believe the principal competitive factors in our markets include product performance, time to market, cost, functional versatility provided by software, customer relationships and reputation, patented innovative designs, levels of product integration, compliance with industry standards and system design cost. We believe we compete favorably with respect to these factors.

Our current products face competition from developers of application processors and specialized display controllers designed by merchant chip vendors, our customers, potential customers and display panel vendors. Additionally, new alternative display processing technologies and industry standards may emerge that compete with technologies we offer.

We also compete with specialized and diversified electronics and semiconductor companies that offer display processors or scaling components including: Actions Microelectronics Co., Ltd., ARM Holdings PLC, Dolby Laboratories, Inc., Egis Technology Inc., Hisilicon Technologies Co., Ltd., i-Chips Technology Inc., Lattice Semiconductor Corporation, MediaTek Inc., Novatek Microelectronics Corp., NVIDIA Corporation, Qualcomm Incorporated, Realtek Semiconductor Corp., Renesas Electronics America Inc., Socionext Inc., Solomon Systech (International) Ltd., STMicroelectronics N.V., Sunplus Technology Co., Ltd., Synaptics Incorporated, Texas Instruments Incorporated, Unisoc Communications, Inc., and other companies. Potential and current competitors may include diversified semiconductor manufacturers and the semiconductor divisions or affiliates of some of our customers, including: Apple Inc., Broadcom Inc., LG Electronics, Inc., MegaChips Corporation, Mitsubishi Digital Electronics America, Inc., NEC Corporation, Panasonic Corporation, Samsung Electronics Co., Ltd., Socionext Inc., ON Semiconductor Corporation, Seiko Epson Corporation, Sharp Electronics Corporation, Sony Corporation, and Toshiba America, Inc. In addition, start-up companies may seek to compete in our markets.

Research and Development

Low power research and development efforts are focused on the development of our solutions for the mobile device, digital projector and video delivery markets. Our development efforts are focused on pursuing higher levels of video performance, integration and new features in order to provide our customers with solutions that enable them to introduce market leading products and help lower final systems costs.

We have invested, and expect to continue to invest, significant resources in research and development activities. Our research and development expenses were \$25.0 million and \$26.0 million in 2020 and 2019, respectively.

Manufacturing

Within the semiconductor industry we are known as a "fabless" company, meaning that we do not manufacture the semiconductors that we design and develop, but instead contract with a limited number of foundries and assembly and test vendors to produce all of our wafers and for completion of finished products. The fabless approach allows us to concentrate our resources on product design and development where we believe we have greater competitive advantages.

See "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K for information on risks related to our manufacturing strategy and processes.

Intellectual Property

We protect our projector, mobile, video delivery and TrueCut businesses with a combination of nondisclosure agreements and patent, copyright, trademark and trade secret laws to protect the algorithms, design and architecture of our technology. As of December 31, 2020, we held 338 patents and have 9 patent applications pending, compared to 347 patents and 17 patent applications pending as of December 31, 2019. The patents we hold relate generally to improvements in the visual display of digital image data including, but not limited to, improvements in image scaling, image correction, automatic image optimization and video signal processing for digital displays. Our U.S. and foreign patents are generally enforceable for 20 years from the date they were filed. Accordingly, our issued patents have from approximately 1 to 18 years remaining in their respective term, depending on their filing dates. We believe that the remaining term of our patents is adequate relative to the expected lives of our related products.

We intend to seek patent protection for other significant technologies that we have already developed and expect to seek patent protection for future products and technologies as necessary. Patents may not be issued as a result of any pending applications and any claims allowed under issued patents may be insufficiently broad to protect our technology. Existing or future patents may be invalidated, diluted, circumvented, challenged or licensed to others. Furthermore, the laws of certain foreign countries in which our products are or may be developed, manufactured or sold, including various countries in Asia, may not protect our products or intellectual property rights in the same manner and to the same extent as do the laws of the U.S. and, thus, make the possibility of piracy of our technology and products more likely in these countries.

The semiconductor industry is characterized by vigorous protection of intellectual property rights, which have resulted in significant and often protracted and expensive litigation. We, our customers or our foundries from time to time may be notified of claims that we may be infringing patents or other intellectual property rights owned by third parties. Litigation by or against us relating to patent infringement or other intellectual property matters could result in significant expense to us and divert the efforts of our technical and management personnel, whether or not such litigation results in a determination favorable to us. In the event of an adverse result in any such litigation, we could be required to pay substantial damages, cease the manufacture, use and sale of infringing products, expend significant resources to develop non-infringing technology, discontinue the use of certain processes or obtain licenses to the infringing technology. We may not be able to settle any alleged patent infringement claim through a cross-licensing arrangement. In the event any third party made a valid claim against us, our customers or our foundries, and a license was not made available to us on terms that are acceptable to us or at all, we would be adversely affected.

See "Risk Factors" in Part I, Item 1A, and "Note 10: Commitments and Contingencies" in Part II, Item 8 of this Annual Report on Form 10-K for information on various risks related to intellectual property.

Environmental Matters

Environmental laws and regulations are complex, change frequently and have tended to become more stringent over time. We have incurred, and may continue to incur, significant expenditures to comply with these laws and regulations and we may incur additional capital expenditures and asset impairments to ensure that our products and our vendors' products are in compliance with these regulations. We would be subject to significant penalties for failure to comply with these laws and regulations.

See "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K for information on various environmental risks.

Employees

As of December 31, 2020, we had a total of 197 employees, all of which were full-time, compared to 229 employees as of December 31, 2019.

Corporate Information

Pixelworks was founded in 1997 and is incorporated under the laws of the state of Oregon. Our stock is traded on the Nasdaq Global Market under the symbol "PXLW".

Availability of Securities and Exchange Commission Filings

We make available through our website our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports and any filings filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act of 1934, free of charge as soon as reasonably practicable after we electronically file or furnish such material with the Securities and Exchange Commission ("SEC"). Our Internet address is *www.pixelworks.com*. The content on, or that can be accessed through, our website is not incorporated by reference into this filing. Our committee charters and code of ethics are also available free of charge on our website.

The SEC maintains an Internet site at <http://www.sec.gov> that contains our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, if any, or other filings filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act, proxy and information statements.

Item 1A. Risk Factors.

The following risks could materially and adversely affect our business, financial condition, and results of operations, and the trading price of our common stock could decline. These risk factors do not identify all of the risks that we face. Our business operations could also be affected by factors that we currently consider to be immaterial or that are unknown to us at the present time. Investors should also refer to the other information contained or incorporated by reference in this Annual Report on Form 10-K for the year ended December 31, 2020, including our consolidated financial statements and related notes, and our other filings made from time to time with the Securities and Exchange Commission ("SEC").

Risks Related to COVID-19

The ongoing effects of the COVID-19 pandemic could disrupt our business or the business of our customers or suppliers, and as such, may adversely affect our financial condition.

Our business, the businesses of our customers, and the businesses of our suppliers could be materially and adversely affected by the effects of the COVID-19 pandemic and the related governmental, business and community responses to it. Additionally, the economies and financial markets of many countries have been impacted by the pandemic, and the longevity and significance of the resulting economic impact is currently unknown. A significant economic downturn could materially and adversely affect our end customers, and thus could negatively impact demand for our products and our operating results.

In response to the COVID-19 pandemic, many state governments in the U.S., issued restrictive orders, including "shelter in place" or "stay at home" orders, that restricted its residents from leaving their homes or returning to work. At Pixelworks, our offices in Japan and North America are currently operating in office and remotely. The potential future impact of any "stay at home" orders or other similar COVID-related restraints on movement, may adversely impact the efficiency and effectiveness of our organization, as well as the operations of our suppliers and customers. We face additional risks and challenges related to having a portion of our workforce working from home, including added pressure on our IT systems and the security of our network, and new challenges as our team adjusts to online collaboration. Additionally, our sales team may not be able to make sales calls to current and potential customers at the same volume as they did prior to the outbreak of the pandemic as they juggle varying competing interests. Also, our ability to make in-person sales calls may be affected in areas with stay at home orders or other restrictions in place, which may, in turn, affect our revenues.

The outbreak of COVID-19 may put additional pressures on our supply chain, including temporary or long-term disruption or delays. If the impact of an outbreak continues for an extended period, it could adversely impact our supply chain and the growth of our revenues. COVID-19 may result in supply shortages of our products or our ability to import, export or sell product to customers in both the U.S. and international markets. Any decrease, limitations or delays on our ability to import, export, or sell our products would harm our business.

The continued uncertain global economic environment and volatility in global credit and financial markets could materially and adversely affect our business and results of operations.

The state of the global economy continues to be uncertain. As a result of these conditions, our manufacturers, vendors and customers might experience deterioration of their businesses, cash flow shortages and difficulty obtaining financing, which could result in interruptions or delays in the performance of any contracts, reductions and delays in customer purchases, delays in or the inability of customers to obtain financing to purchase our products, and bankruptcy of customers. Furthermore, the constraints in the capital and credit markets, may limit the ability of our customers to meet their liquidity needs, which could result in an impairment of their ability to make timely payments to us and reduce their demand for our products, adversely impacting our results of operations and cash flows. This environment has also made it difficult for us to accurately forecast and plan future business activities.

Company Specific Risks

If we fail to meet the evolving needs of our markets, identify new products, services or technologies, or successfully compete in our target markets, our revenue and financial results will be adversely impacted.

Pixelworks designs, develops and markets visual processing and advanced media processing solutions in the mobile video, digital projection and video delivery markets. Our success depends to a significant extent on our ability to meet the evolving needs of these markets and to enhance our existing products, solutions and technologies. In addition, our success depends on our ability to identify emerging industry trends and to develop new products, solutions and technologies. Our existing markets and products and new markets and products may require a considerable investment of technical, financial, compliance, sales and marketing resources.

We cannot assure you that our strategic direction will result in innovative products and technologies that provide value to our customers and partners. If we fail to anticipate the changing needs of our target markets and emerging technology trends, or adapt that strategy as market conditions evolve, in a timely manner to exploit potential market opportunities our business will be harmed. In addition, if demand for products and solutions from these markets is below our expectations, if we fail to achieve consumer or market acceptance of them or if we are not able to develop these products and solutions in a cost effective or efficient manner, we may not realize benefits from our strategy.

Our target markets remain extremely competitive, and we expect competition to intensify as current competitors expand their product and/or service offerings, industry standards continue to evolve and new competitors enter these markets. If we are unable to successfully compete in our target markets, demand for our products, solutions and technologies could decrease, which would cause our revenue to decline and our financial results to suffer.

Our product strategy, which is targeted at markets demanding superior video and digital image quality as well as efficient video delivery, may not address the demands of our target customers and may not lead to increased revenue in a timely manner or at all, which could materially adversely affect our results of operations and limit our ability to grow.

We have adopted a product strategy that focuses on our core competencies in visual display processing and delivering high levels of video and digital image quality. With this strategy, we continue to make further investments in the development of our image processor architecture for the digital projector market, with particular focus on adding increased performance and functionality. For the mobile device market, our strategy focuses on implementing our intellectual property ("IP") to improve the video performance of our customers' image processors through the use of our MotionEngine® advanced video co-processor integrated circuits. This strategy is designed to address the needs of the high-resolution and high-quality segment of these markets. Such markets may not develop or may take longer to develop than we expect. We cannot assure you that the products we are developing will adequately address the demands of our target customers, or that we will be able to produce our new products at costs that enable us to price these products competitively.

Achieving design wins involves lengthy competitive selection processes that require us to incur significant expenditures prior to generating any revenue or without any guarantee of any revenue related to this business. If we fail to generate revenue after incurring substantial expenses to develop our products, our business and operating results would suffer.

We must achieve "design wins" that enable us to sell our semiconductor solutions for use in our customers' products. These competitive selection processes typically are lengthy and can require us to incur significant research and development expenditures and dedicate scarce engineering resources in pursuit of a single customer opportunity. We may not achieve a design win and may never generate any revenue despite incurring significant research and development expenditures. This could cause us to lose revenue and require us to write off obsolete inventory and could weaken our position in future competitive selection processes.

Even if our product strategy is properly targeted, we cannot assure you that the products we are developing will lead to an increase in revenue from new design wins. To achieve design wins, we must design and deliver cost-effective, innovative and integrated semiconductors that overcome the significant costs associated with qualifying a new supplier and which make developers reluctant to change component sources. Additionally, potential developers may be unwilling to select our products due to concerns over our financial strength. Further, design wins do not necessarily result in developers ordering large volumes of our products. Developers can choose at any time to discontinue using our products in their designs or product development efforts. A design win is not a binding commitment by a developer to purchase our products, but rather a decision by a developer to use our products in its design process. Even if our products are chosen to be incorporated into a developer's products, we may still not realize significant revenue from the developer if its products are not commercially successful or it chooses to qualify, or incorporate the products, of a second source. Additionally, even if our product strategy is successful at achieving design wins and increasing our revenue, we may continue to incur operating losses due to the significant research and development costs that are required to develop competitive products for the digital projection market and mobile market.

System security and data protection breaches, as well as cyber-attacks, could disrupt our operations, reduce our expected revenue and increase our expenses, which could adversely affect our stock price and damage our reputation.

Security breaches, computer malware and cyber-attacks have become more prevalent and sophisticated in recent years. These attacks have occurred on our systems in the past and are expected to occur in the future. Experienced computer programmers, hackers and employees may be able to penetrate our security controls and misappropriate or compromise our confidential information, or that of our employees or third parties. These attacks may create system disruptions or cause shutdowns. For portions of our IT infrastructure, including business management and communication software products, we rely on products and services provided by third parties. These providers may also experience breaches and attacks to their products which may impact our systems. Data security breaches may also result from non-technical means, such as actions by an employee with access to our systems.

Actual or perceived breaches of our security measures or the accidental loss, inadvertent disclosure or unapproved dissemination of proprietary information or sensitive or confidential data about us, our partners, our customers or third parties could expose the parties affected to a risk of loss, or misuse of this information, resulting in litigation and potential liability, damage to our brand and reputation or other harm to our business. Our efforts to prevent and overcome these challenges could increase our expenses and may not be successful. We may experience interruptions, delays, cessation of service and loss of existing or potential customers. Such disruptions could adversely impact our ability to fulfill orders and interrupt other critical functions. Delayed sales, lower margins or lost customers as a result of these disruptions could adversely affect our financial results, stock price and reputation.

If we fail to retain or attract the specialized technical and management personnel required to successfully operate our business, it could harm our business and may result in lost sales and diversion of management resources.

Our success depends on the continued services of our executive officers and other key management, engineering, and sales and marketing personnel and on our ability to continue to attract, retain and motivate qualified personnel. Competition for skilled engineers and management personnel is intense within our industry, and we may not be successful in hiring and retaining qualified individuals. For example, we have experienced, and may continue to experience, difficulty and increased compensation expense in order to hire and retain qualified engineering personnel in our Shanghai design center. The loss of, or inability to hire, key personnel could limit our ability to develop new products and adapt existing products to our customers' requirements, and may result in lost sales and a diversion of management resources. Any transition in our senior management team may involve a diversion of resources and management attention, be disruptive to our daily operations or impact public or market perception, any of which could have a negative impact on our business or stock price.

We may not fully realize the estimated savings from our restructurings in a timely manner or at all, and our restructuring programs may result in business disruptions and decrease productivity. Any of the foregoing would negatively affect our financial condition and results of operations.

In each of 2020 and 2019, we executed restructuring plans to make the operation of the Company more efficient. We may not be able to implement our restructuring programs as planned, and we may need to take additional measures to fulfill the objectives of our restructuring. The anticipated expenses associated with our restructuring programs may differ from or exceed our expectations, and we might not be able to realize the full amount of estimated savings from the restructuring programs in a timely manner or at all. Additionally, our restructuring plans may result in business disruptions or decreases in productivity. As a result, our restructuring plans could have an adverse impact on our financial condition or results of operations.

We have significantly fewer financial resources than most of our competitors, which limits our ability to implement new products or enhancements to our current products and may require us to implement additional future restructuring plans, which in turn could adversely affect our future sales and financial condition.

Financial resource constraints could limit our ability to execute our product strategy or require us to implement additional restructuring plans, particularly if we are unable to generate sufficient cash from operations or obtain additional sources of financing. Any future restructuring actions may slow our development of new or enhanced products by limiting our research and development and engineering activities. Our cash balances are also lower than those of our competitors, which may limit our ability to develop competitive new products on a timely basis or at all. If we are unable to successfully introduce new or enhanced products, our sales, operating results and financial condition will be adversely affected.

If we are not profitable in the future, we may be unable to continue our operations.

We have incurred operating losses each fiscal year since 2010 and have an accumulated deficit of \$415.1 million as of December 31, 2020. If and when we achieve profitability depends upon a number of factors, including our ability to develop and market innovative products, accurately estimate inventory needs, contract effectively for manufacturing capacity and maintain sufficient funds to finance our activities. We cannot assure our investors that we will ever achieve annual profitability, or that we will be able to maintain profitability if achieved. If we are not profitable in the future, we may be unable to continue our operations.

A significant amount of our revenue comes from a limited number of customers and distributors and from time to time we may enter into exclusive deals with customers, exposing us to increased credit risk and subjecting our cash flow to the risk that any of our customers or distributors could decrease or cancel its orders.

The display manufacturing market is highly concentrated and we are, and will continue to be, dependent on a limited number of customers and distributors for a substantial portion of our revenue. Sales to our top distributor represented 23% and 28% of revenue for the years ended December 31, 2020 and 2019, respectively. If any of our distributors ceases to do business with us, it may be difficult for us to find adequate replacements, and even if we do, it may take some time. The loss of any of our top distributors could negatively affect our results of operations. Additionally, revenue attributable to our top five end customers represented 58% and 77% of revenue for the years ended December 31, 2020 and 2019, respectively. As of December 31, 2020, we had two accounts that each represented 10% or more of accounts receivable. As of December 31, 2019, we had three accounts that each represented 10% or more of accounts receivable. Orders included in our backlog may be fully or partially cancelable. A reduction, delay or cancellation of orders from one or more of our significant customers, or a decision by one or more of our significant customers to select products manufactured by a competitor or to use its own internally-developed semiconductors, would significantly and negatively impact our revenue. Further, the concentration of our accounts receivable with a limited number of customers increases our credit risk. The failure of these customers to pay their balances, or any customer to pay future outstanding balances, would result in an operating expense and reduce our cash flows.

We generally do not have long-term purchase commitments from our customers and if our customers cancel or change their purchase commitments, our revenue and operating results could suffer.

Substantially all of our sales to date have been made on a purchase order basis. We generally do not have long-term commitments with our customers. As a result, our customers may cancel, change or delay product purchase commitments, which could cause our revenue to decline and materially and adversely affect our results of operations.

Our revenue and operating results can fluctuate from period to period, which could cause our share price to decline.

Our revenue and operating results have fluctuated in the past and may fluctuate from period to period in the future due to a variety of factors, many of which are beyond our control. Factors that may contribute to these fluctuations include those described in this "Risk Factors" section of this report, such as the timing, changes in or cancellation of orders by customers, market acceptance of our products and our customers' products and the timing and extent of product development costs. Additionally, our business is subject to seasonality related to the markets we serve and the location of our customers. For example, we have historically experienced higher revenue from the digital projector market in the third quarter of the year, and lower revenue in the first quarter of the year. As a result of these and other factors, the results of any prior quarterly or annual periods should not be relied upon as indications of our future revenue or operating performance. Fluctuations in our revenue and operating results could cause our share price to decline.

We may not be able to borrow funds under our credit facility or secure future financing which could affect our ability to fund fluctuations in our working capital requirements.

In December 2010, we entered into a Loan and Security Agreement with Silicon Valley Bank, which was later amended on December 14, 2012, December 4, 2013, December 18, 2015, December 15, 2016, July 21, 2017, December 21, 2017, December 18, 2018, December 18, 2019, April 17, 2020 and December 14, 2020 (as amended, the "Revolving Loan Agreement"). The Revolving Loan Agreement provides a secured working capital-based revolving line of credit (the "Revolving Line") in an aggregate amount of up to the lesser of (i) \$10.0 million or (ii) \$2.5 million plus 80% of eligible domestic accounts receivable and certain foreign accounts receivable of both Pixelworks and ViXS Systems, Inc., subject to certain limitations on the amount of accounts receivables attributable to ViXS. The Revolving Line has a maturity date of March 26, 2021. We view this line of credit as a source of available liquidity to fund fluctuations in our working capital requirements; however, all credit extensions are subject to the bank's sole discretion. If we experience an increase in order activity from our customers, our cash balance may decrease due to the need to purchase inventories to fulfill those orders. If this occurs, we may need to draw on this facility in order to maintain our liquidity.

This facility contains various conditions, covenants and representations with which we must be in compliance in order to borrow funds. We cannot assure you that we will be in compliance with these conditions, covenants and representations when we may need to borrow additional funds under this facility, nor can we assure you that the bank will consent to such borrowings, in which case we may need to seek alternative sources of funding, which may not be available quickly or which may be available only on less favorable terms. Our inability to raise the necessary funding in the event we need it could negatively affect our business. In addition, the amount available to us under this facility depends in part on our accounts receivable balance which could decrease due to a decrease in revenue.

This facility expires on March 26, 2021, after which time we may need to secure new financing to continue funding fluctuations in our working capital requirements. We cannot assure you that we will be able to secure new financing in a timely manner or at all, or secure financing on terms that are acceptable to us.

If we are unable to generate sufficient cash from operations and are forced to seek additional financing alternatives, or in the event we acquire or make an investment in companies that complement our business, our working capital may be adversely affected and our shareholders may experience dilution or our operations may be impaired.

We may be unable to generate or sustain positive cash flow from operating activities and would then be required to use existing cash and cash equivalents to support our working capital and other cash requirements. Additionally, from time to time, we may evaluate acquisitions of, or investments in, businesses, products or technologies that complement our business. Any transactions, if consummated, may consume a material portion of our working capital or require the issuance of equity securities that may result in dilution to existing shareholders. If additional funds are required to support our working capital requirements, acquisitions or other purposes, we may seek to raise funds through debt and equity financing or from other sources. If we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our shareholders could be significantly diluted, and these newly-issued securities may have rights, preferences or privileges senior to those of existing shareholders. 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 operating flexibility, and would also require us to incur interest expense. We can provide no assurance that additional financing will be available at all or, if available, that we would be able to obtain additional financing on terms favorable to us.

We license our intellectual property, which exposes us to risks of infringement or misappropriation, and may cause fluctuations in our operating results.

We have licensed certain intellectual property to third parties and may enter into additional license arrangements in the future. We cannot assure you, however, that others will be interested in licensing our intellectual property on commercially favorable terms or at all. We also cannot ensure that licensees will honor agreed-upon market restrictions, not infringe upon or misappropriate our intellectual property or maintain the confidentiality of our proprietary information.

IP license agreements are complex and earning and recognizing revenue under these agreements depends upon many factors, including completion of milestones, allocation of values to delivered items and customer acceptances. Many of these factors require significant judgments. Also, generating revenue from these arrangements is a lengthy and complex process that may last beyond the period in which efforts begin and, once an agreement is in place, the timing of revenue recognition may depend on events such as customer acceptance of deliverables, achievement of milestones, our ability to track and report progress on contracts, customer commercialization of the licensed technology and other factors, any or all of which may or may not be achieved. The accounting rules associated with recognizing revenue from these transactions are complex and subject to interpretation. Due to these factors, the amount of licensing revenue recognized in any period, if any, and our results of operations, may differ significantly from our expectations.

Finally, because licensing revenue typically has a higher margin compared to product sales, licensing revenue can have a disproportionate impact on our gross profit and results of operations. There is no assurance that we will be able to maintain a consistent level of licensing revenue or mix of licensing revenue and revenue from product sales, which could result in wide fluctuations in our results of operations from period to period, making it difficult to accurately measure the performance of our business.

Our net operating loss carryforwards may be limited or they may expire before utilization.

As of December 31, 2020, we had federal, state and foreign net operating loss carryforwards of approximately \$195.9 million, \$8.6 million, and \$34.3 million respectively, which will begin to expire in 2021. These net operating loss carryforwards may be used to offset future taxable income and thereby reduce our income taxes otherwise payable. However, we cannot assure you that we will have taxable income in the future before all or a portion of these net operating loss carryforwards expire. Additionally, our federal net operating losses may be limited by Section 382 of the Internal Revenue Code of 1986, as amended (the "Code"), which imposes an annual limit on the ability of a corporation that undergoes an "ownership change" to use its net operating loss carryforwards to reduce its tax liability. An ownership change is generally defined as a greater than 50% increase in equity ownership by 5% shareholders in any three-year period. In the event of certain changes in our shareholder base, we may at some time in the future experience an "ownership change" and the use of our federal net operating loss carryforwards may be limited. In addition, the Tax Cuts and Jobs Act (the "TCJA"), limits the deduction for net operating loss carryforwards to 80 percent of taxable income for losses arising in taxable years beginning after December 31, 2020.

We face a number of risks as a result of the concentration of our operations and customers in Asia.

Many of our customers are located in Japan, China, Korea, or Taiwan. Sales outside the U.S. accounted for approximately 93% and 95% of revenue for the years ended December 31, 2020 and 2019, respectively. We anticipate that sales outside the U.S. will continue to account for a substantial portion of our revenue in future periods. In addition, customers who incorporate our products into their products sell a substantial portion of their products outside of the U.S. All of our products are also manufactured outside of the U.S. and most of our current manufacturers are located in Taiwan. Furthermore, most of our employees are located in China, Japan and Taiwan. Our Asian operations require significant management attention and resources, and we are subject to many risks associated with operations in Asia, including, but not limited to:

- outbreaks of health epidemics in China or other parts of Asia, including COVID-19;
- difficulties in managing international distributors and manufacturers due to varying time zones, languages and business customs;
- compliance with U.S. laws affecting operations outside of the U.S., such as the Foreign Corrupt Practices Act;
- reduced or limited protection of our IP, particularly in software, which is more prone to design piracy;
- difficulties in collecting outstanding accounts receivable balances;
- changes in tax rates, tax laws and the interpretation of those laws;
- difficulties regarding timing and availability of export and import licenses;

- ensuring that we obtain complete and accurate information from our Asian operations to make proper disclosures in the United States;
- political and economic instability;
- difficulties in maintaining sales representatives outside of the U.S. that are knowledgeable about our industry and products;
- changes in the regulatory environment in China, Japan, Taiwan and Korea that may significantly impact purchases of our products by our customers or our customers' sales of their own products;
- imposition of new tariffs, quotas, trade barriers and similar trade restrictions on our sales;
- varying employment and labor laws; and
- greater vulnerability to infrastructure and labor disruptions than in established markets.

Any of these factors could require a disproportionate share of management's attention, result in increased costs or decreased revenues, and could materially affect our product sales, financial condition and results of operations.

Our operations in Asia expose us to heightened risks due to natural disasters.

The risk of natural disasters in the Pacific Rim region is significant. Natural disasters in countries where our manufacturers or customers are located could result in disruption of our manufacturers' and customers' operations, resulting in significant delays in shipment of, or significant reductions in orders for, our products. There can be no assurance that we can locate additional manufacturing capacity or markets on favorable terms, or find new customers, in a timely manner, if at all. Natural disasters in this region could also result in:

- reduced end user demand due to the economic impact of any natural disaster;
- a disruption to the global supply chain for products manufactured in areas affected by natural disasters that are included in products purchased either by us or by our customers;
- an increase in the cost of products that we purchase due to reduced supply; and
- other unforeseen impacts as a result of the uncertainty resulting from a natural disaster.

We face additional risks associated with our operations in China and our results of operations and financial position may be harmed by changes in China's political, economic or social conditions or changes in U.S.-China relations.

We have, and expect to continue to have, significant operations in China. The economy of China differs from the economies of many countries in important respects such as structure, government involvement, level of development, growth rate, capital reinvestment, allocation of resources, self-sufficiency, rate of inflation, foreign currency flows and balance of payments position, among others. There can be no assurance that China's economic policies will be consistent or effective and our results of operations and financial position may be harmed by changes in China's political, economic or social conditions. Additionally, the political and economic relationship between the U.S. and China is uncertain, and any changes in policy as a result may adversely affect our business. For example, if China were to take action against the United States in response to actual or perceived political or economic threats or changes in policy, such as the detainment of Americans traveling on business, our operations could be adversely affected.

Additionally, our Chinese subsidiary is considered a foreign-invested enterprise and is subject to laws and regulations applicable to foreign investment in China and, in particular, laws applicable to foreign-invested enterprises. For example, China's government imposes control over the convertibility of RMB into foreign currencies, which can cause difficulties converting cash held in RMB to other currencies. While the overall effect of legislation over the past two decades has significantly enhanced the protections afforded to various foreign investments in China, China has not developed a fully integrated legal system, and recently enacted laws and regulations may not sufficiently cover all aspects of economic activities in China. Because these laws and regulations are relatively new, and published court decisions are limited and nonbinding in nature, the interpretation and enforcement of these laws and regulations involve uncertainties. In addition, China's legal system is based in part on government policies and internal rules, some of which are not published on a timely basis or at all, which may have a retroactive effect. As a result, we may not be aware of our violation of these policies and rules until after the violation occurs. Any administrative and court proceedings in China may be protracted, resulting in substantial costs and diversion of resources and management attention. Further, since Chinese administrative and court authorities have significant discretion in interpreting and implementing statutory and contractual terms, it may be more difficult to evaluate the outcome of administrative and court proceedings. These uncertainties may also impede our ability to enforce the contracts entered into by our Chinese subsidiary and could materially and adversely affect our business and results of operations.

Our international operations expose us to risks resulting from the fluctuations of foreign currencies.

We are exposed to risks resulting from the fluctuations of foreign currencies, primarily those of Japan, Taiwan, Korea and China. Additionally, with the acquisition of ViXS, we are exposed to risks resulting from fluctuations in the Canadian dollar. We sell our products to OEMs that incorporate our products into other products that they sell outside of the U.S. While sales of our products to OEMs are denominated in U.S. dollars, the products sold by OEMs are denominated in foreign currencies. Accordingly, any strengthening of the U.S. dollar against these foreign currencies will increase the foreign currency price equivalent of our products, which could lead to a change in the competitive nature of these products in the marketplace. This, in turn, could lead to a reduction in revenue.

In addition, a portion of our operating expenses, such as employee salaries and foreign income taxes, are denominated in foreign currencies. Accordingly, our operating results are affected by changes in the exchange rate between the U.S. dollar and those currencies. Any future strengthening of those currencies against the U.S. dollar will negatively impact our operating results by increasing our operating expenses as measured in U.S. dollars.

We may engage in financial hedging techniques in the future as part of a strategy to address potential foreign currency exchange rate fluctuations. These hedging techniques, however, may not be successful at reducing our exposure to foreign currency exchange rate fluctuations and may increase costs and administrative complexity.

Failure to comply with anti-bribery, anti-corruption, and anti-money laundering laws could subject us to penalties and other adverse consequences.

We are subject to the Foreign Corrupt Practices Act ("FCPA") and other anti-corruption, anti-bribery and anti-money laundering laws in various jurisdictions. From time to time, we may leverage third parties to help conduct our businesses abroad. We and our third-party intermediaries may have direct or indirect interactions with officials and employees of government agencies or state-owned or affiliated entities and may be held liable for the corrupt or other illegal activities of these third-party business partners and intermediaries, our employees, representatives, contractors, channel partners, and agents, even if we do not explicitly authorize such activities. While we have policies and procedures to address compliance with such laws, we cannot assure you that all of our employees and agents 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-bribery, anti-corruption laws, and anti-money laundering laws could result in whistleblower complaints, adverse media coverage, investigations, loss of export privileges, severe criminal or civil sanctions, or suspension or debarment from U.S. government contracts, all of which may have an adverse effect on our reputation, our business, results of operations and financial condition.

Our reported financial results may be materially and adversely affected by changes in accounting principles generally accepted in the United States.

Generally accepted accounting principles in the United States are subject to interpretation by the Financial Accounting Standards Board ("FASB"), the SEC, and various bodies formed to promulgate and interpret appropriate accounting principles. A change in these principles or interpretations could have a significant effect on our reported financial results and could materially and adversely affect the transactions completed before the announcement of a change. Additionally, the adoption of new or revised accounting principles may require that we make significant changes to our systems, processes and controls. In February 2016, the FASB issued Accounting Standards Update No. 2016-02, *Leases (Topic 842)* ("ASU 2016-02"). ASU 2016-02 requires a dual approach for lessee accounting under which a lessee would account for leases as finance leases or operating leases. ASU 2016-02 became effective for us on January 1, 2019. Upon adoption, we recognized additional operating lease liabilities of \$6,847 based on the present value of the remaining minimum rental payments under current leasing standards for existing operating leases. We also recognized ROU assets of \$6,224, which represents the operating lease liability adjusted for accrued rent and impairment of ROU assets.

If we are unable to maintain effective disclosure controls and internal controls over financial reporting, investors may lose confidence in the accuracy and completeness of our financial reports, and the market price of our common stock may be materially and adversely affected.

In the second quarter of 2019, we identified a material weakness in our internal controls over financial reporting related to the review of aged liabilities for possible extinguishment due to the expiration of the statute of limitation, which was remediated as of December 31, 2019. As a result, investors may have lost confidence in the accuracy and completeness of our financial reports and effectiveness which may cause the price of our common stock to decline. Additionally, if any new internal control procedures which may be adopted or our existing internal control procedures are deemed inadequate, or if we identify additional material weaknesses in our disclosure controls or internal controls over financial reporting in the future, we will be unable to assert that our internal controls are effective. If we are unable to do so, or if our auditors are unable to attest to the effectiveness of our internal controls, we could lose investor confidence in the accuracy and completeness of our financial reports, which would cause the price of our common stock to decline.

As we have limited insurance coverage, any incurred liability resulting from uncovered claims could adversely affect our financial condition and results of operations.

Our insurance policies may not be adequate to fully offset losses from covered incidents, and we do not have coverage for certain losses. For example, we do not have earthquake insurance related to our Asian operations because adequate coverage is not offered at economically justifiable rates. If our insurance coverage is inadequate to protect us against catastrophic losses, any uncovered losses could adversely affect our financial condition and results of operations.

Our dependence on selling to distributors and integrators increases the complexity of managing our supply chain and may result in excess inventory or inventory shortages.

Selling to distributors and OEMs that build display devices based on specifications provided by branded suppliers, also referred to as integrators, reduces our ability to forecast sales accurately and increases the complexity of our business. Our sales are generally made on the basis of customer purchase orders rather than long-term purchase commitments. Our distributors, integrators and customers may cancel or defer purchase orders at any time, but we must order wafer inventory from our contract manufacturers three to four months in advance.

The estimates we use for our advance orders from contract manufacturers are based, in part, on reports of inventory levels and production forecasts from our distributors and integrators, which act as intermediaries between us and the companies using our products. This process requires us to make numerous assumptions concerning demand and to rely on the accuracy of the reports and forecasts of our distributors and integrators, each of which may introduce error into our estimates of inventory requirements. Our failure to manage this challenge could result in excess inventory or inventory shortages that could materially impact our operating results or limit the ability of companies using our semiconductors to deliver their products. If we overestimate demand for our products, it could lead to significant charges for obsolete inventory. On the other hand, if we underestimate demand, we could forego revenue opportunities, lose market share and damage our customer relationships.

We may be unable to successfully manage any future growth, including the integration of any acquisition or equity investment, which could disrupt our business and severely harm our financial condition.

If we fail to effectively manage any future internal growth, our operating expenses may increase more rapidly than our revenue, adversely affecting our financial condition and results of operations. To manage any future growth effectively in a rapidly evolving market, we must be able to maintain and improve our operational and financial systems, train and manage our employee base and attract and retain qualified personnel with relevant experience. We could spend substantial amounts of time and money in connection with expansion efforts for which we may not realize any profit. Our systems, procedures, controls or financial resources may not be adequate to support our operations and we may not be able to grow quickly enough to exploit potential market opportunities. In addition, we may not be able to successfully integrate the businesses, products, technologies or personnel of any entity that we might acquire in the future, or we may fail to realize the anticipated benefits of any such acquisition. The successful integration of any acquired business as well as the retention of personnel may require significant attention from our management and could divert resources from our existing business, which in turn could have an adverse effect on our business operations. Acquired assets or businesses may not achieve the anticipated benefits we expect due to a number of factors including: unanticipated costs or liabilities associated with such acquisition, including in the case of acquisitions we may make outside of the United States, difficulty in operating in foreign countries or complying with foreign regulatory requirements, incurrence of acquisition-related costs, harm to our relationships with existing customers as a result of such acquisition, harm to our brand and reputation, the loss of key employees in the acquired businesses, use of resources that are needed in other parts of our business, and use of substantial portions of our available cash to consummate any such acquisition. Any failure to successfully integrate any entity we may acquire or any failure to achieve the anticipated benefits of any such acquisition could disrupt our business and seriously harm our financial condition.

Continued compliance with regulatory and accounting requirements will be challenging and will require significant resources.

We spend a significant amount of management time and external resources to comply with changing laws, regulations and standards relating to corporate governance and public disclosure, including evolving SEC rules and regulations, Nasdaq Global Market rules, the Dodd-Frank Wall Street Reform and Consumer Protection Act and the Sarbanes-Oxley Act of 2002, which requires management's annual review and evaluation of internal control over financial reporting. Failure to comply with these laws and rules could lead to investigation by regulatory authorities, de-listing from the Nasdaq Global Market, or penalties imposed on us.

Regulations related to conflict minerals may adversely impact our business.

The SEC has adopted disclosure and reporting rules intended to improve transparency and accountability concerning the supply of certain minerals, known as conflict minerals, originating from the Democratic Republic of Congo ("DRC") and adjoining countries. These rules require us to conduct a reasonable inquiry to determine the origin of certain materials used in our products and disclose whether our products use any materials containing conflict minerals originating from the DRC and adjoining countries. Since we do not own or operate a semiconductor fabrication facility and do not manufacture our products internally, we are dependent on the information provided by third-party foundries and production facilities regarding the materials used and the supply chains for the materials. Further, there are costs associated with complying with these rules, including costs incurred to conduct inquiries to determine the sources of any materials containing conflict minerals used in our products, to fulfill our reporting requirements and to develop and implement potential changes to products, processes or sources of supply if it is determined that our products contain or use any conflict minerals from the DRC or adjoining countries. The implementation of these rules could also affect the sourcing, supply and pricing of materials used in our products. For example, there may only be a limited number of suppliers offering "conflict free" materials and we cannot be sure that we will be able to obtain necessary "conflict free" materials from such suppliers in sufficient quantities or at reasonable prices. In addition, we may face reputational challenges if we determine that any of our products contain minerals that are not conflict free or if we are unable to sufficiently verify the origins for all materials containing conflict minerals used in our products through the procedures we may implement.

Our effective income tax rate is subject to unanticipated changes in, or different interpretations of, tax rules and regulations, and forecasting our effective income tax rate is complex and subject to uncertainty.

As a global company, we are subject to taxation by a number of taxing authorities and as such, our tax rates vary among the jurisdictions in which we operate. Unanticipated changes in our tax rates could affect our future results of operations. Our effective tax rates could be adversely affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in tax laws or the interpretation of tax laws either in the U.S. or abroad, or by changes in the valuation of our deferred tax assets and liabilities. The ultimate outcomes of any future tax audits are uncertain, and we can give no assurance as to whether an adverse result from one or more of them would have a material effect on our operating results and financial position.

The computation of income tax expense is complex as it is based on the laws of numerous tax jurisdictions and requires significant judgment on the application of complicated rules governing accounting for tax provisions under U.S. generally accepted accounting principles. Income tax expense for interim quarters is based on our forecasted tax rate for the year, which includes forward looking financial projections, including the expectations of profit and loss by jurisdiction, and contains numerous assumptions. For these reasons, our tax rate may be materially different than our forecast.

We rely upon certain critical information systems for the operation of our business, and the failure of any critical information system may result in serious harm to our business.

We maintain and rely upon certain critical information systems for the effective operation of our business. These information systems include telecommunications, the Internet, our corporate intranet, various computer hardware and software applications, network communications and e-mail. These information systems are subject to attacks, failures and access denials from a number of potential sources including viruses, destructive or inadequate code, power failures, and physical damage to computers, communication lines and networking equipment. To the extent that these information systems are under our control, we have implemented security procedures, such as virus protection software and firewall monitoring, to address the outlined risks. Security procedures for information systems cannot be guaranteed to be failsafe and our inability to use or access these information systems at critical times could compromise the timely and efficient operation of our business. Additionally, any compromise of our information security could result in the unauthorized publication of our confidential business or proprietary information, cause an interruption in our operations, result in the unauthorized release of customer or employee data, result in a violation of privacy or other laws, or expose us to a risk of litigation or damage our reputation, any or all of which could harm our business and operating results.

Environmental laws and regulations may cause us to incur significant expenditures to comply with applicable laws and regulations, and we may be assessed considerable penalties for noncompliance.

We are subject to numerous environmental laws and regulations. Compliance with current or future environmental laws and regulations could require us to incur substantial expenses which could harm our business, financial condition and results of operations. We have worked, and will continue to work, with our suppliers and customers to ensure that our products are compliant with enacted laws and regulations. Failure by us or our contract manufacturers to comply with such legislation could result in customers refusing to purchase our products and could subject us to significant monetary penalties in connection with a violation, either of which would have a material adverse effect on our business, financial condition and results of operations.

Company Risks Related to the Semiconductor Industry and Our Markets

Dependence on a limited number of sole-source, third-party manufacturers for our products exposes us to possible shortages based on low manufacturing yield, errors in manufacturing, uncontrollable lead-times for manufacturing, capacity allocation, price increases with little notice, volatile inventory levels and delays in product delivery, any of which could result in delays in satisfying customer demand, increased costs and loss of revenue.

We do not own or operate a semiconductor fabrication facility and do not have the resources to manufacture our products internally. We rely on a limited number of foundries and assembly and test vendors to produce all of our wafers and for completion of finished products. Our wafers are not fabricated at more than one foundry at any given time and our wafers typically are designed to be fabricated in a specific process at only one foundry. Sole sourcing each product increases our dependence on our suppliers. We have limited control over delivery schedules, quality assurance, manufacturing yields, potential errors in manufacturing and production costs. We do not have long-term supply contracts with our third-party manufacturers, so they are not obligated to supply us with products for any specific period of time, quantity or price, except as may be provided in a particular purchase order. Our suppliers can increase the prices of the products we purchase from them with little notice, which may cause us to increase the prices to our customers and harm our competitiveness. Because our requirements represent only a small portion of the total production capacity of our contract manufacturers, they could reallocate capacity to other customers during periods of high demand for our products, as they have done in the past. We expect this may occur again in the future.

Establishing a relationship with a new contract manufacturer in the event of delays or increased prices would be costly and burdensome. The lead time to make such a change would be at least nine months, and the estimated time for us to adapt a product's design to a particular contract manufacturer's process is at least four months. Additionally, we have chosen, and may continue to choose new foundries to manufacture our wafers which in turn, may require us to modify our design methodology flow for the process technology and intellectual property cores of the new foundry. If we have to qualify a new foundry or packaging, assembly and testing supplier for any of our products or if we are unable to obtain our products from our contract manufacturers on schedule, at costs that are acceptable to us, or at all, we could incur significant delays in shipping products, our ability to satisfy customer demand could be harmed, our revenue from the sale of products may be lost or delayed and our customer relationships and ability to obtain future design wins could be damaged.

Our highly integrated products and high-speed mixed signal products are difficult to manufacture without defects and the existence of defects could result in increased costs, delays in the availability of our products, reduced sales of products or claims against us.

The manufacture of semiconductors is a complex process and it is often difficult for semiconductor foundries to produce semiconductors free of defects. Because many of our products are more highly integrated than other semiconductors and incorporate mixed signal analog and digital signal processing, multi-chip modules and embedded memory technology, they are even more difficult to produce without defects. Defective products can be caused by design or manufacturing difficulties. Identifying quality problems can be performed only by analyzing and testing our semiconductors in a system after they have been manufactured. The difficulty in identifying defects is compounded because the process technology is unique to each of the multiple semiconductor foundries we contract with to manufacture our products. Despite testing by both our customers and us, errors or performance problems may be found in existing or new semiconductors. Failure to achieve defect-free products may result in increased costs and delays in the availability of our products. Defects may also divert the attention of our engineering personnel from our product development efforts to find and correct the issue, which would delay our product development efforts.

Additionally, customers could seek damages from us for their losses, and shipments of defective products may harm our reputation with our customers. If a product liability claim is brought against us, the cost of defending the claim could be significant and would divert the efforts of our technical and management personnel and harm our business. Further, our business liability insurance may be inadequate or future coverage may be unavailable on acceptable terms, which could adversely impact our financial results.

We experience a small number of semiconductor field failures infrequently in certain customer applications that required us to institute additional testing. As a result of these field failures, we have incurred warranty costs due to customers returning potentially affected products and have experienced reductions in revenues due to delays in production. Our customers have also experienced delays in receiving product shipments from us that resulted in the loss of revenue and profits. Additionally, shipments of defective products could cause us to lose customers or to incur significant replacement costs, either of which would harm our reputation and our business. Any defects, errors or bugs could also interrupt or delay sales of our new products to our customers, which would adversely affect our financial results.

The development of new products is extremely complex and we may be unable to develop our new products in a timely manner, which could result in a failure to obtain new design wins and/or maintain our current revenue levels.

In addition to the inherent difficulty of designing complex integrated circuits, product development delays may result from:

- difficulties in hiring and retaining necessary technical personnel;
- difficulties in reallocating engineering resources and overcoming resource limitations;
- difficulties with contract manufacturers;
- changes to product specifications and customer requirements;
- changes to market or competitive product requirements; and
- unanticipated engineering complexities.

If we are not successful in the timely development of new products, we may fail to obtain new design wins and our financial results will be adversely affected.

Intense competition in our markets may reduce sales of our products, reduce our market share, decrease our gross profit and result in large losses.

We compete with specialized and diversified electronics and semiconductor companies that offer display processors or scaling components including: Actions Microelectronics Co., Ltd., ARM Holdings PLC, Dolby Laboratories, Inc., Egis Technology Inc., Hisilicon Technologies Co., Ltd., i-Chips Technology Inc., Lattice Semiconductor Corporation, MediaTek Inc., Novatek Microelectronics Corp., NVIDIA Corporation, Qualcomm Incorporated, Realtek Semiconductor Corp., Renesas Electronics America Inc., Socionext Inc., Solomon Systech (International) Ltd., STMicroelectronics N.V., Sunplus Technology Co., Ltd., Synaptics Incorporated, Texas Instruments Incorporated, Unisoc Communications, Inc., and other companies. Potential and current competitors may include diversified semiconductor manufacturers and the semiconductor divisions or affiliates of some of our customers, including: Apple Inc., Broadcom Inc., LG Electronics, Inc., MegaChips Corporation, Mitsubishi Digital Electronics America, Inc., NEC Corporation, Panasonic Corporation, Samsung Electronics Co., Ltd., Socionext Inc., ON Semiconductor Corporation, Seiko Epson Corporation, Sharp Electronics Corporation, Sony Corporation, and Toshiba America, Inc. In addition, start-up companies may seek to compete in our markets.

Many of our competitors have longer operating histories and greater resources to support development and marketing efforts than we do. Some of our competitors operate their own fabrication facilities. These competitors may be able to react more quickly and devote more resources to efforts that compete directly with our own. Additionally, any consolidation in the semiconductor industry may impact our competitive position. Our current or potential customers have developed, and may continue to develop, their own proprietary technologies and become our competitors. Increased competition from both competitors and our customers' internal development efforts could harm our business, financial condition and results of operations by, for example, increasing pressure on our profit margin or causing us to lose sales opportunities. For example, frame rate conversion technology similar to that used in our line of MotionEngine® advanced video co-processors continues to be integrated into the SoC and display timing controller products of our competitors. We cannot assure you that we can compete successfully against current or potential competitors.

If we are not able to respond to the rapid technological changes and evolving industry standards in the markets in which we compete, or seek to compete, our products may become less desirable or obsolete.

The markets in which we compete or seek to compete are subject to rapid technological change and miniaturization capabilities, frequent new product introductions, changing customer requirements for new products and features and evolving industry standards. The introduction of new technologies and emergence of new industry standards could render our products less desirable or obsolete, which could harm our business and significantly decrease our revenue. Examples of changing industry standards include the growing use of broadband to deliver video content, increased display resolution and size, faster screen refresh rates, video capability such as High Dynamic Range, the proliferation of new display devices and the drive to network display devices together. Our failure to predict market needs accurately or to timely develop new competitively priced products or product enhancements that incorporate new industry standards and technologies, including integrated circuits with increasing levels of integration and new features, using smaller geometry process technologies, may harm market acceptance and sales of our products.

Our products are incorporated into our customers' products, which have different parts and specifications and utilize multiple protocols that allow them to be compatible with specific computers, video standards and other devices. If our customers' products are not compatible with these protocols and standards, consumers will return, or not purchase these products and the markets for our customers' products could be significantly reduced. Additionally, if the technology used by our customers becomes less competitive due to cost, customer preferences or other factors relative to alternative technologies, sales of our products could decline.

We use a customer-owned tooling process for manufacturing most of our products, which exposes us to the possibility of poor yields and unacceptably high product costs.

We build most of our products on a customer-owned tooling basis, whereby we directly contract the manufacture of our products, including wafer production, assembly and testing. As a result, we are subject to increased risks arising from wafer manufacturing yields and risks associated with coordination of the manufacturing, assembly and testing process. Poor product yields result in higher product costs, which could make our products less competitive if we increase our prices to compensate for our higher costs or could result in lower gross profit margins if we do not increase our prices.

We depend on manufacturers of our semiconductor products not only to respond to changes in technology and industry standards but also to continue the manufacturing processes on which we rely.

To respond effectively to changes in technology and industry standards, we depend on our contracted foundries to implement advanced semiconductor technologies and our operations could be adversely affected if those technologies are unavailable, delayed or inefficiently implemented. In order to increase performance and functionality and reduce the size of our products, we are continuously developing new products using advanced technologies that further miniaturize semiconductors and we are dependent on our foundries to develop and provide access to the advanced processes that enable such miniaturization. We cannot be certain that future advanced manufacturing processes will be implemented without difficulties, delays or increased expenses. Our business, financial condition and results of operations could be materially adversely affected if advanced manufacturing processes are unavailable to us, substantially delayed or inefficiently implemented.

Creating the capacity for new technological changes may cause manufacturers to discontinue older manufacturing processes in favor of newer ones. We must then either retire the affected part or port (develop) a new version of the part that can be manufactured with a newer process technology. In the event that a manufacturing process is discontinued, our current suppliers may be unwilling or unable to manufacture our current products. We may not be able to place last time buy orders for the old technology or find alternate manufacturers of our products to allow us to continue to produce products with the older technology while we expend the significant costs for research and development and time to migrate to new, more advanced processes.

Shortages of materials used in the manufacturing of our products and other key components of our customers' products may increase our costs, impair our ability to ship our products on time and delay our ability to sell our products.

From time to time, shortages of components and materials that are critical to the manufacture of our products and our customers' products may occur. Such critical components and materials include semiconductor wafers and packages, double data rate memory die, display components, analog-to-digital converters, digital receivers, video decoders and voltage regulators. If material shortages occur, we may incur additional costs or be unable to ship our products to our customers in a timely fashion, both of which could harm our business and adversely affect our results of operations.

Because of our long product development process and sales cycles, we may incur substantial costs before we earn associated revenue and ultimately may not sell as many units of our products as we originally anticipated.

We develop products based on anticipated market and customer requirements and incur substantial product development expenditures, which can include the payment of large up-front, third-party license fees and royalties, prior to generating the associated revenue. Our work under these projects is technically challenging and places considerable demands on our limited resources, particularly on our most senior engineering talent. Additionally, the transition to smaller geometry process technologies continues to significantly increase the cost and complexity of new product development, particularly with regards to tooling, software tools, third party IP and engineering resources. Because the development of our products incorporates not only our complex and evolving technology, but also our customers' specific requirements, a lengthy sales process is often required before potential customers begin the technical evaluation of our products. Our customers typically perform numerous tests and extensively evaluate our products before incorporating them into their systems. The time required for testing, evaluation and design of our products into a customer's system can take nine months or more. It can take an additional nine months or longer before a customer commences volume shipments of systems that incorporate our products, if at all. Because of the lengthy development and sales cycles, we will experience delays between the time we incur expenditures for research and development, sales and marketing and inventory and the time we generate revenue, if any, from these expenditures.

Furthermore, we have entered into and may in the future enter into, co-development agreements that do not guarantee future sales volumes and limit our ability to sell the developed products to other customers. The exclusive nature of these development agreements increases our dependence on individual customers, particularly since we are limited in the number of products we are able to develop at any one time.

If actual sales volumes for a particular product are substantially less than originally anticipated, we may experience large write-offs of capitalized license fees, software development tools, product masks, inventories or other capitalized or deferred product-related costs, any of which would negatively affect our operating results.

Our developed software may be incompatible with industry standards and challenging and costly to implement, which could slow product development or cause us to lose customers and design wins.

We provide our customers with software development tools and with software that provides basic functionality for our integrated circuits and enables enhanced connectivity of our customers' products. Software development is a complex process and we are dependent on software development languages and operating systems from vendors that may limit our ability to design software in a timely manner. Also, as software tools and interfaces change rapidly, new software languages introduced to the market may be incompatible with our existing systems and tools, requiring significant engineering efforts to migrate our existing systems in order to be compatible with those new languages. Software development disruptions could slow our product development or cause us to lose customers and design wins. The integration of software with our products adds complexity, may extend our internal development programs and could impact our customers' development schedules. This complexity requires increased coordination between hardware and software development schedules and increases our operating expenses without a corresponding increase in product revenue. This additional level of complexity lengthens the sales cycle and may result in customers selecting competitive products requiring less software integration.

The competitiveness and viability of our products could be harmed if necessary licenses of third-party technology are not available to us on terms that are acceptable to us or at all.

We license technology from independent third parties that is incorporated into our products or product enhancements. Future products or product enhancements may require additional third-party licenses that may not be available to us on terms that are acceptable to us or at all. In addition, in the event of a change in control of one of our licensors, it may become difficult to maintain access to its licensed technology. If we are unable to obtain or maintain any third-party license required to develop new products and product enhancements, we may have to obtain substitute technology with lower quality or performance standards, or at greater cost, either of which could seriously harm the competitiveness of our products.

Our limited ability to protect our IP and proprietary rights could harm our competitive position by allowing our competitors to access our proprietary technology and to introduce similar products.

Our ability to compete effectively with other companies depends, in part, on our ability to maintain the proprietary nature of our technology, including our semiconductor designs and software code. We provide the computer programming code for our software to customers in connection with their product development efforts, thereby increasing the risk that customers will misappropriate our proprietary software. We rely on a combination of patent, copyright, trademark and trade secret laws, as well as nondisclosure agreements and other methods, to help protect our proprietary technologies. As of December 31, 2020, we held 338 patents and had 9 patent applications pending for protection of our significant technologies. Competitors in both the U.S. and foreign countries, many of whom have substantially greater resources than we do, may apply for and obtain patents that will prevent, limit or interfere with our ability to make and sell our products, or they may develop similar technology independently or design around our patents. Effective patent, copyright, trademark and trade secret protection may be unavailable or limited in foreign countries and, thus, make the possibility of piracy of our technology and products more likely in these countries.

We cannot assure you that the degree of protection offered by patent or trade secret laws will be sufficient. Furthermore, we cannot assure you that any patents will be issued as a result of any pending applications or that any claims allowed under issued patents will be sufficiently broad to protect our technology. We may incur significant costs to stop others from infringing our patents. In addition, it is possible that existing or future patents may be invalidated, diluted, circumvented, challenged or licensed to others.

Others may bring infringement or indemnification actions against us that could be time-consuming and expensive to defend.

We may become subject to claims involving patents or other intellectual property rights. In recent years, there has been significant litigation in the U.S. and in other jurisdictions involving patents and other intellectual property rights. This litigation is particularly prevalent in the semiconductor industry, in which a number of companies aggressively use their patent portfolios to bring infringement claims. In recent years, there has been an increase in the filing of so-called "nuisance suits," alleging infringement of intellectual property rights. These claims may be asserted initially or as counterclaims in response to claims made by a company alleging infringement of intellectual property rights. These suits pressure defendants into entering settlement arrangements to quickly dispose of such suits, regardless of merit. We may also face claims brought by companies that are organized solely to hold and enforce patents. In addition, we may be required to indemnify our customers against IP claims related to their usage of our products as certain of our agreements include indemnification provisions from third parties relating to our intellectual property.

IP claims could subject us to significant liability for damages and invalidate our proprietary rights. Responding to such claims, regardless of their merit, can be time-consuming, result in costly litigation, divert management's attention and resources and cause us to incur significant expenses. As each claim is evaluated, we may consider the desirability of entering into settlement or licensing agreements. No assurance can be given that settlements will occur or that licenses can be obtained on acceptable terms or that litigation will not occur. In the event there is a temporary or permanent injunction entered prohibiting us from marketing or selling certain of our products, or a successful claim of infringement against us requiring us to pay damages or royalties to a third-party and we fail to develop or license a substitute technology, our business, results of operations or financial condition could be materially adversely affected. Any IP litigation or claims also could force us to do one or more of the following:

- stop selling products using technology that contains the allegedly infringing IP;
- attempt to obtain a license to the relevant IP, which may not be available on terms that are acceptable to us or at all;
- attempt to redesign those products that contain the allegedly infringing IP; or
- pay damages for past infringement claims that are determined to be valid or which are arrived at in settlement of such litigation or threatened litigation.

If we are forced to take any of the foregoing actions, we may incur significant additional costs or be unable to manufacture and sell our products, which could seriously harm our business. In addition, we may not be able to develop, license or acquire non-infringing technology under reasonable terms. These developments could result in an inability to compete for customers or otherwise adversely affect our results of operations.

Our products are characterized by average selling prices that can decline over relatively short periods of time, which will negatively affect our financial results unless we are able to reduce our product costs or introduce new products with higher average selling prices.

Average selling prices for our products can decline over relatively short periods of time, while many of our product costs are relatively fixed. When our average selling prices decline, our gross profit declines unless we are able to sell more units or reduce the cost to manufacture our products. We have experienced declines in our average selling prices and expect that we will continue to experience them in the future, although we cannot predict when they may occur or how severe they will be. Our financial results will suffer if we are unable to offset any reductions in our average selling prices by increasing our sales volumes, reducing our costs, adding new features to our existing products or developing new or enhanced products in a timely manner with higher selling prices or gross profits.

The cyclical nature of the semiconductor industry may lead to significant variances in the demand for our products and could harm our operations.

In the past, the semiconductor industry has been characterized by significant downturns and wide fluctuations in supply and demand. Also, the industry has experienced significant fluctuations in anticipation of changes in general economic conditions, including economic conditions in Asia, Europe and North America. The cyclical nature of the semiconductor industry has also led to significant variances in product demand and production capacity. We have experienced, and may continue to experience, periodic fluctuations in our financial results because of changes in industry-wide conditions.

General Risks

The price of our common stock has and may continue to fluctuate substantially.

Our stock price and the stock prices of technology companies similar to Pixelworks have been highly volatile. The price of our common stock may decline and the value of our shareholders' investment may be reduced regardless of our performance.

The daily trading volume of our common stock has historically been relatively low, although, in the three most recent years, trading volume increased compared to historical levels. As a result of the historically low volume, our shareholders may be unable to sell significant quantities of common stock in the public trading markets without a significant reduction in the price of our common shares. Additionally, market fluctuations, as well as general economic and political conditions, including recessions, interest rate changes or international currency fluctuations, may negatively impact the market price of our common stock. Other factors that could negatively impact our stock price include:

- actual or anticipated fluctuations in our operating results;
- changes in or failure to meet expectations as to our future financial performance;
- changes in or failure to meet financial estimates of securities analysts;
- announcements by us or our competitors of technological innovations, design wins, contracts, standards, acquisitions or divestitures;
- the operating and stock price performance of other comparable companies;
- issuances or proposed issuances of equity, debt or other securities by us, or sales of securities by our security holders; and
- changes in market valuations of other technology companies.

Any inability or perceived inability of investors to realize a gain on an investment in our common stock could have an adverse effect on our business, financial condition and results of operations by potentially limiting our ability to retain our customers, to attract and retain qualified employees and to raise capital. In addition, in the past, following periods of volatility in the overall market and the market price of a particular 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.

The interest of our current or potential significant shareholders may conflict with other shareholders and they may attempt to effect changes or acquire control, which could adversely affect our results of operations and financial condition.

Our shareholders may from time to time engage in proxy solicitations, advance shareholder proposals, acquire control or otherwise attempt to effect changes, including by directly voting their shares on shareholder proposals. Campaigns by shareholders to effect changes at publicly traded companies are sometimes led by investors seeking to increase short-term shareholder value through actions such as financial restructuring, increased debt, special dividends, stock repurchases or sales of assets or the entire company. Responding to proxy contests and other actions by activist shareholders can be costly and time-consuming, disrupting our operations and diverting the attention of our Board of Directors and senior management from the pursuit of business strategies. Additionally, uncertainty over our direction and leadership may negatively impact our relationship with our customers and make it more difficult to attract and retain qualified personnel and business partners. As a result, shareholder campaigns could adversely affect our results of operations and financial condition.

Future sales of our equity could result in significant dilution to our existing shareholders and depress the market price of our common stock.

It is likely that we will need to seek additional capital in the future and from time to time. If this financing is obtained through the issuance of equity securities, debt convertible into equity securities, options or warrants to acquire equity securities or similar instruments or securities, our existing shareholders will experience dilution in their ownership percentage upon the issuance, conversion or exercise of such securities and such dilution could be significant. For example, on December 7, 2020, we completed a private placement of 724,288 shares of common stock to a certain accredited investor at a purchase price of \$2.071 per share. On December 15, 2020, we completed a private placement of 2,475,712 shares of common stock to a certain accredited investor at a purchase price of \$2.071. The issuance and sale of the shares in the private placement had a dilutive impact on our existing stockholders. Additionally, on December 14, 2020, we completed the sale of 4,900,000 shares of common stock in an underwritten registered offering. On December 16, 2020, an additional 735,000 shares were issued pursuant to the 30-day over-allotment option exercised by the underwriter. With the over-allotment shares, a total of 5,635,000 shares of common stock were sold in the offering at a price to the public of \$2.45 per share. Additionally, pursuant to our “at the market” equity offering program, we may sell shares of our common stock having aggregate sales proceeds of up to \$25 million from time to time through Cowen and Company, LLC, as our agent. During the year ended December 31, 2020, we sold an aggregate of 1,747,466 shares of our common stock under this at the market offering. The issuance and sale of additional shares of our common stock pursuant to our “at the market” equity offering program will have a dilutive impact on our existing stockholders. Additionally, any new equity securities issued by us could have rights, preferences or privileges senior to those of our common stock. Further, the issuance and sale of, or the perception that we may issue and sell, additional shares of common stock pursuant to our “at the market” equity offering program or an additional private placement could have the effect of depressing the market price of our common stock or increasing the volatility thereof.

Any issuance by us or sales of our securities by our security holders, including by any of our affiliates, or the perception that such issuances or sales could occur, could negatively impact the market price of our securities. For example, a number of shareholders own significant blocks of our common stock. If one or more of these large shareholders were to sell large portions of their holdings in a relatively short time, for liquidity or other reasons, the prevailing market price of our common stock could be negatively affected. This could result in further potential dilution to our existing shareholders and the impairment of our ability to raise capital through the sale of equity, debt or other securities.

We may be unable to maintain compliance with Nasdaq Marketplace Rules which could cause our common stock to be delisted from the Nasdaq Global Market. This could result in the lack of a market for our common stock, cause a decrease in the value of our common stock, and adversely affect our business, financial condition and results of operations.

Under the Nasdaq Marketplace Rules our common stock must maintain a minimum price of \$1.00 per share for continued inclusion on the Nasdaq Global Market. Our stock price was previously below \$1.00 on May 6, 2009 and was \$1.22 on February 12, 2016 and we cannot guarantee that our stock price will remain at or above \$1.00 per share. If the price again drops below \$1.00 per share, our stock could become subject to delisting, and we may seek shareholder approval for a reverse stock split, which in turn could produce adverse effects and may not result in a long-term or permanent increase in the price of our common stock. Further, for continued listing on the Nasdaq Global Market we must have at least 400 total shareholders.

In addition to the minimum \$1.00 per share and 400 total shareholders requirements, the Nasdaq Global Market has other continued listing requirements, and we must meet all of the criteria under at least one of the following three standards: (i) a minimum of \$50.0 million in total asset value and \$50.0 million in revenues in the latest fiscal year or in two of the last three fiscal years, at least 1.1 million publicly held shares and at least \$15 million in market value of publicly held shares; (ii) a minimum of \$50.0 million in market value of listed securities, at least 1.1 million publicly held shares and at least \$15.0 million in market value of publicly held shares; or (iii) a minimum of \$10.0 million in shareholders' equity, at least 750,000 publicly held shares and at least \$5 million in market value of publicly held shares. As of December 31, 2020, we were in compliance with these listing requirements. However, as recently as June 30, 2017, our total asset value was less than \$50.0 million. In addition, as recently as during the first quarter of 2016, the aggregate market value of our listed securities was below \$50.0 million. Our stock price is volatile and we believe that we continue to remain susceptible to the market value of our listed securities and/or the market value of our publicly held securities falling below \$50.0 million and \$15.0 million, respectively. Accordingly, we cannot assure you that we will be able to continue to comply with Nasdaq Global Market's listing requirements. Should we be unable to remain in compliance with these requirements, our stock could become subject to delisting.

If our common stock is delisted, trading of the stock will most likely take place on an over-the-counter market established for unlisted securities. An investor is likely to find it less convenient to sell, or to obtain accurate quotations in seeking to buy, our common stock on an over-the-counter market, and many investors may not buy or sell our common stock due to difficulty in accessing over-the-counter markets, or due to policies preventing them from trading in securities not listed on a national exchange or other reasons. For these reasons and others, delisting would adversely affect the liquidity, trading volume and price of our common stock, causing the value of an investment in us to decrease and having an adverse effect on our business, financial condition and results of operations by limiting our ability to attract and retain qualified executives and employees and limiting our ability to raise capital.

The anti-takeover provisions of Oregon law and in our articles of incorporation could adversely affect the rights of the holders of our common stock, including by preventing a sale or takeover of us at a price or prices favorable to the holders of our common stock.

Provisions of our articles of incorporation and bylaws and provisions of Oregon law may have the effect of delaying or preventing a merger or acquisition of us, making a merger or acquisition of us less desirable to a potential acquirer or preventing a change in our management, even if our shareholders consider the merger, acquisition or change in management favorable or if doing so would benefit our shareholders. In addition, these provisions could limit the price that investors would be willing to pay in the future for shares of our common stock. The following are examples of such provisions:

- if the number of directors is fixed by the board at eight or more, our board of directors is divided into three classes serving staggered terms, which would make it more difficult for a group of shareholders to quickly replace a majority of directors;
- our board of directors is authorized, without prior shareholder approval, to create and issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us or to effect a change of control, commonly referred to as "blank check" preferred stock;
- members of our board of directors can be removed only for cause and at a meeting of shareholders called expressly for that purpose, by the vote of 75 percent of the votes then entitled to be cast for the election of directors;
- our board of directors may alter our bylaws without obtaining shareholder approval; and shareholders are required to provide advance notice for nominations for election to the board of directors or for proposing matters to be acted upon at a shareholder meeting;
- Oregon law permits our board to consider other factors beyond stockholder value in evaluating any acquisition offer (so-called "expanded constituency" provisions); and
- a supermajority (67%) vote of shareholders is required to approve certain fundamental transactions.

Item 1B. Unresolved Staff Comments.

Not applicable.

Item 2. Properties.

We lease facilities around the world to house our engineering, sales, customer support, administrative and operations functions. We do not own any of our facilities. As of December 31, 2020, our major facilities consisted of the following:

Location	Function(s)	Square Feet Utilized	Lease Expiration
China	Engineering; sales; customer support	36,000	Various dates through March 2023
Toronto	Engineering; administration	10,000	March 2027
California	Administration; engineering; sales	10,000	September 2024
Taiwan	Customer support; sales; operations; engineering	16,000	Various dates through May 2023
Oregon	Administration	5,000	December 2024
Japan	Sales; customer support	3,000	January 2021

Item 3. Legal Proceedings.

We are subject to legal matters that arise from time to time in the ordinary course of our business. Although we currently believe that resolving such matters, individually or in the aggregate, will not have a material adverse effect on our financial position, our results of operations, or our cash flows, these matters are subject to inherent uncertainties and our view of these matters may change in the future.

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 for Registrant's Common Equity and Related Stockholder Matters

Our common stock is listed for trading on the Nasdaq Global Market under the symbol "PXLW". Our stock began trading on May 19, 2000.

As of March 5, 2021, there were 118 shareholders of record of our common stock and the last per share sales price of the common stock on that date was \$3.35. The number of beneficial owners of our common stock is substantially greater than the number of shareholders of record because a significant portion of our outstanding common stock is held in broker "street name" for the benefit of individual investors.

Item 6. Selected Financial Data.

Not applicable.

Management's Discussion and Analysis of Financial Condition and Results of Operation.

COVID-19

In March 2020, the World Health Organization declared the COVID-19 outbreak a pandemic, and the virus continues to spread in areas where we operate and sell our products and services. Several public health organizations have recommended, and many local governments have implemented, certain measures to slow and limit the transmission of the virus, including shelter in place and social distancing ordinances, which has resulted in a significant deterioration of economic conditions in many of the countries in which we operate.

The spread of COVID-19 has caused us to modify our business practices, including implementing work-from-home policies and restricting travel by our employees. We also took certain actions in response to the pandemic, which are set forth above in "Note Regarding COVID-19."

The impact of the pandemic on the global economy and on our business, as well as on the business of our suppliers and customers, and the additional measures that may be needed in the future in response to it, will depend on many factors beyond our control and knowledge. We will continually monitor the situation to determine what actions may be necessary or appropriate to address the impact of the pandemic, which may include actions mandated or recommended by federal, state or local authorities. While we expect the impacts of COVID-19 to be temporary, the disruptions caused by the virus have negatively affected our revenue and results of operations in 2020. For example, our revenues for fiscal year 2020 were lower than initially anticipated at the beginning of the year and travel restrictions and border closures have had a material impact on our ability to achieve our business goals.

Overview

Pixelworks is a leading provider of high-performance and power-efficient visual processing solutions that bridge the gap between video content formats and rapidly advancing display capabilities. We develop and market semiconductor and software solutions that enable consistently high-quality, authentic viewing experiences in a wide variety of applications from cinema to smartphones. Our primary target markets include Mobile (smartphone, gaming and tablet), Home Entertainment (TV, personal video recorder ("PVR"), over-the-air ("OTA") and projector), Content (creation, remastering and delivery), and Business & Education (projector).

We were one of the first companies to commercially launch a video System on Chip ("SoC") capable of deinterlacing 1080i HDTV signals and one of the first companies with a commercial dual-channel 1080i deinterlacer integrated circuit. Our Topaz product line was one of the industry's first single-chip SoC for digital projection. We first introduced our motion estimation / motion compensation technology ("MEMC") for TVs and in recent years introduced a mobile-optimized MEMC solution for smartphones, one of several unique features in the mobile-optimized Iris visual processor. In 2019, we introduced our Hollywood award-winning TrueCut® video platform, the industry's first motion grading technology that allows fine tuning of motion appearance in cinematic content for a wide range of frame rates, shutter angles and display types.

Our solutions enable worldwide manufacturers to offer leading-edge consumer electronics and professional display products, as well as video delivery and streaming solutions for content service providers. Our core visual display processing technology intelligently processes digital images and video from a variety of sources and optimizes the content for a superior viewing experience. Our video coding technology reduces storage requirements, significantly reduces bandwidth constraint issues and converts content between multiple formats to enable seamless delivery of video, including OTA streaming, while also maintaining end-to-end content security.

Rapid growth in video consumption, combined with the move towards high frame rate / refresh rate displays, especially in mobile, is increasing the demand for our visual processing and video delivery solutions. Our technologies can be applied to a wide range of devices from large-screen projectors to cinematic big screens, to low-power mobile tablets and smartphones, to high-quality video infrastructure equipment and streaming devices. Our products are architected and optimized for power, cost, bandwidth, and overall system performance, according to the requirements of the specific application. On occasion, we have also licensed our technology.

As of December 31, 2020, we had an intellectual property portfolio of 338 patents related to the visual display of digital image data. We focus our research and development efforts on developing video algorithms that improve quality and architectures that reduce system power, cost, bandwidth and increase overall system performance and device functionality. We seek to expand our technology portfolio through internal development and co-development with business partners, and we continually evaluate acquisition opportunities and other ways to leverage our technology into other high-value markets.

Pixelworks was founded in 1997 and is incorporated under the laws of the state of Oregon. On August 2, 2017, we acquired ViXS Systems Inc., a corporation organized in Canada ("ViXS").

Historically, significant portions of our revenue have been generated by sales to a relatively small number of end customers and distributors. We sell our products worldwide through a direct sales force, distributors and manufacturers' representatives. We sell to distributors in China, Europe, Japan, Korea, Southeast Asia, Taiwan and the U.S. Our distributors often provide engineering support to our end customers and often have valuable and established relationships with our end customers. In certain countries in which we operate, it is customary to sell to distributors. While distributor payment to us is not dependent upon the distributor's ability to resell the product or to collect from the end customer, the distributors may provide longer payment terms to end customers than those we would offer.

Significant portions of our products are sold overseas. Sales outside the U.S. accounted for approximately 93% and 95% of revenue in 2020 and 2019, respectively. Our integrators, branded manufacturers and branded suppliers incorporate our products into systems that are sold worldwide. All of our revenue to date has been denominated in U.S. dollars.

Seasonality

Our business is subject to seasonality related to the markets we serve and the location of our customers. For example, we have historically experienced higher revenue from the digital projector market in the third quarter of the year, and lower revenue in the first quarter of the year, as our Japanese customers reduce inventories in anticipation of their March 31 fiscal year end.

Results of Operations

For the year ended December 31, 2020 compared with year ended December 31, 2019.

Revenue, net

Net revenue was as follows (in thousands):

	Year ended December 31,		2020 v. 2019	
	2020	2019	\$ change	% change
Revenue, net	\$ 40,855	\$ 68,755	\$ (27,900)	(41)%

Net revenue decreased \$27.9 million, or 41%, from 2019 to 2020.

Revenue recorded in 2020 consisted of \$39.2 million in revenue from the sale of IC products and \$1.7 million in revenue related to engineering services, license revenue and other. Revenue recorded in 2019 consisted of \$66.3 million in revenue from the sale of IC products and \$2.5 million in revenue related to engineering services, license revenue and other.

The decrease in IC revenue is primarily due to decreased unit sales into the digital projector and video delivery markets as a result of customers continuing to correct their inventory levels and the disruptions caused by COVID-19 to our revenue. The decrease in revenue related to engineering services, license revenue and other is primarily due to the recognition of license revenue during the first quarter of 2019.

Cost of revenue and gross profit

Cost of revenue and gross profit were as follows (in thousands):

	Year ended December 31,			
	2020	% of revenue	2019	% of revenue
Direct product costs and related overhead ¹	\$ 18,807	46 %	\$ 32,587	47 %
Amortization of acquired developed technology	1,192	3	1,192	2
Stock-based compensation	432	1	367	1
Restructuring	173	0	—	0
Inventory charges ²	66	0	102	0
Inventory step-up and backlog amortization	—	0	12	0
Total cost of revenue	\$ 20,670	51 %	\$ 34,260	50 %
Gross profit	\$ 20,185	49 %	\$ 34,495	50 %

¹ Includes purchased materials, assembly, test, labor, employee benefits and royalties.

² Includes charges to reduce inventory to lower of cost or market and a benefit for sales of previously written down inventory.

Gross profit margin decreased to 49% in 2020 compared to 50% in 2019, primarily due to less absorption of fixed overhead costs and high margin license revenue recorded in 2019, partially offset by a more favorable mix of sales into the digital projector market.

Pixelworks' gross profit margin is subject to variability based on changes in revenue levels, product mix, average selling prices, startup costs, restructuring charges, amortization related to acquired developed technology, amortization of inventory step-up and backlog, and the timing and execution of manufacturing ramps as well as other factors.

Research and development

Research and development expense includes compensation and related costs for personnel, development-related expenses including non-recurring engineering and fees for outside services, depreciation and amortization, expensed equipment, facilities and information technology expense allocations and travel and related expenses.

Research and development expense was as follows (in thousands):

	Year ended December 31,		2020 v. 2019	
	2020	2019	\$ change	% change
Research and development	\$ 25,040	\$ 26,018	\$ (978)	(4)%

Research and development expense decreased \$1.0 million, or 4%, from 2019 to 2020. The decrease was primarily due to a general decrease across multiple expense categories as we focused on cost management in response to the effects of COVID-19. These decreases were partially offset by an increase in non-recurring engineering expense due to the timing of development activities.

Selling, general and administrative

Selling, general and administrative expense includes compensation and related costs for personnel, sales commissions, allocations for facilities and information technology expenses, travel, outside services and other general expenses incurred in our sales, marketing, customer support, management, legal and other professional and administrative support functions.

Selling, general and administrative expense was as follows (in thousands):

	Year ended December 31,		2020 v. 2019	
	2020	2019	\$ change	% change
Selling, general and administrative	\$ 19,840	\$ 21,202	\$ (1,362)	(6)%

Selling, general and administrative expense decreased \$1.4 million, or 6%, from 2019 to 2020. The decrease was primarily due to a general decrease across multiple expense categories as we focused on cost management in response to the effects of COVID-19 as well as due to severance expense associated with the resignation of our former Chief Financial Officer in 2019. These decreases were partially offset by an increase in stock-based compensation expense due to the timing of awards granted.

Restructurings

In August 2020, we executed a restructuring plan to make the operation of the Company more efficient (the "August 2020 Plan"). The August 2020 Plan included an approximately 14% reduction in workforce, primarily in the areas of operations, research and development, sales and marketing.

In January 2020, we executed a restructuring plan to make the operation of the Company more efficient (the "January 2020 Plan"). The January 2020 Plan included an approximately 4% reduction in workforce, primarily in the areas of research and development and sales.

In June 2019, we executed a restructuring plan ("the 2019 Plan") to make the operation of the Company more efficient. The 2019 Plan included an approximately 2% reduction in workforce, primarily in the areas of sales and operations.

Restructuring expense was as follows (in thousands):

	Year ended December 31,	
	2020	2019
Employee severance and benefits	\$ 2,214	\$ 398
Total restructuring expense	\$ 2,214	\$ 398
Included in cost of revenue	\$ 173	\$ —
Included in operating expenses	2,041	398

During 2020, we recorded \$1.6 million in restructuring expense related to the August 2020 Plan and \$0.6 million in restructuring expense related to the January 2020 Plan. The January 2020 Plan was complete in the first quarter of 2020 and we did not incur any further charges related to the January 2020 Plan after the first quarter of 2020. The August 2020 Plan was complete in the fourth quarter of 2020 and we do not expect to incur any further expenses related to the August 2020 Plan.

During 2019, we incurred expenses of \$0.4 million related to the 2019 Plan. The 2019 Plan was complete as of the second quarter of 2019 and we did not incur any further charges related to the 2019 Plan after the second quarter of 2019.

Interest income and other, net

Interest income and other, net, consisted of the following (in thousands):

	Year ended December 31,	
	2020	2019
Other income	\$ 161	\$ 425
Interest income	87	327
Interest expense	(239)	(158)
Total interest income and other, net	\$ 9	\$ 594

Provision for income taxes

The provision for income taxes was as follows (in thousands):

	Year ended December 31,	
	2020	2019
Provision for income taxes	\$ 598	\$ 453

The income tax expense recorded for the year ended December 31, 2020 is primarily comprised of \$0.6 million in current and deferred tax expense for our profitable cost-plus foreign jurisdictions and accruals for tax contingencies in foreign jurisdictions, partially offset by the reversal of previously recorded tax contingencies due to the expiration of the applicable statute of limitations.

The income tax expense recorded for the year ended December 31, 2019 is comprised of \$0.5 million in current and deferred tax expense for our profitable cost-plus foreign jurisdictions and accruals for tax contingencies in foreign jurisdictions, partially offset by the reversal of previously recorded tax contingencies due to the expiration of the applicable statute of limitations.

As of December 31, 2020 and 2019, we continue to record a full valuation allowance against our U.S. net deferred tax assets, as it is not more likely than not that we will realize a benefit from these assets in a future period. We have not provided a valuation allowance against any of our other foreign net deferred tax assets, with the exception of Canada, as we have concluded it is more likely than not that we will realize a benefit from these assets in a future period because our subsidiaries in these jurisdictions are cost-plus taxpayers.

As of December 31, 2020, we have federal, state and foreign net operating loss carryforwards of approximately \$195.9 million, \$8.6 million, and \$34.3 million respectively, which will begin expiring in 2021. As of December 31, 2020, we have available federal, state and foreign research and experimentation tax credit carryforwards of approximately \$8.6 million, \$4.8 million and \$26.9 million respectively. The federal and state tax credits will begin expiring in 2021 while the foreign tax credits have an indefinite life. In addition, our Canadian subsidiary has unclaimed scientific and experimental expenditures to be carried forward and applied against future income in Canada of approximately \$121.1 million. We have a general foreign tax credit of \$0.2 million, which will begin expiring in 2021. Our ability to utilize our federal net operating losses may be limited by Section 382 of the Internal Revenue Code of 1986, as amended, which imposes an annual limit on the ability of a corporation that undergoes an "ownership change" to use its net operating loss carryforwards to reduce its tax liability. An ownership change is generally defined as a greater than 50% increase in equity ownership by 5% shareholders in any three-year period.

Liquidity and Capital Resources

Cash and cash equivalents

Total cash and cash equivalents increased \$24.0 million from \$7.3 million at December 31, 2019 to \$31.3 million at December 31, 2020. Short-term marketable securities was \$0.3 million at December 31, 2020, and \$7.0 million at December 31, 2019. The net increase in cash, cash equivalents and short-term marketable securities of \$17.3 million resulted primarily from \$12.7 million in net proceeds from our underwritten registered public offering of our common stock, \$6.2 million in net proceeds from a private placement investment, \$4.4 million in net proceeds from our "at the market" equity offering, \$0.8 million in proceeds from a Paycheck Protection Program loan and \$0.6 million in proceeds from the issuances of common stock under our employee equity incentive plans. These increases were partially offset by \$3.7 million used in operating activities, \$2.8 million used for purchases of property and equipment and licensed technology and \$1.0 million used for payments on other asset financings.

As of December 31, 2020, our cash, cash equivalents and short-term marketable securities balance consisted of \$7.4 million in cash, \$0.3 million in corporate debt securities and \$23.8 million in cash equivalents held in U.S. dollar denominated money market funds. Our investment policy requires that our portfolio maintains a weighted average maturity of less than 12 months. Additionally, no maturities can extend beyond 24 months and concentrations with individual securities are limited. At the time of purchase, short-term credit rating must be rated at least A-2 / P-2 / F-2 by at least two Nationally Recognized Statistical Rating Organizations ("NRSRO") and securities of issuers with a long-term credit rating must be rated at least A or A3 by at least two NRSROs. Our investment policy is reviewed at least annually by our Audit Committee.

Accounts receivable, net

Accounts receivable, net decreased to \$4.7 million at December 31, 2020 from \$10.9 million at December 31, 2019. Average number of days sales outstanding decreased to 44 days at December 31, 2020 from 61 days at December 31, 2019. The decrease in accounts receivable and days sales outstanding was due to normal fluctuations in the timing of sales and customer receipts within the fourth quarter of 2020, and the fourth quarter of 2019.

Inventories

Inventories decreased to \$2.4 million at December 31, 2020 from \$5.4 million at December 31, 2019. Inventory turnover decreased to 6.0 at December 31, 2020 from 7.9 at December 31, 2019 primarily due to lower average inventory balances and lower cost of goods sold during the fourth quarter of 2020 compared to the fourth quarter of 2019. Inventory turnover is calculated based on annualized quarterly operating results and average inventory balances during the quarter.

Capital resources

Short-term line of credit

On December 21, 2010, we entered into a Loan and Security Agreement with Silicon Valley Bank (the "Bank"), which was amended on December 14, 2012, December 4, 2013, December 18, 2015, December 15, 2016, July 21, 2017, December 21, 2017, December 18, 2018, December 18, 2019, April 17, 2020 and December 14, 2020 (as amended, the "Revolving Loan Agreement"). The Revolving Loan Agreement provides a secured working capital-based revolving line of credit (the "Revolving Line") in an aggregate amount of up to the lesser of (i) \$10.0 million, or (ii) \$2.5 million plus 80% of eligible domestic accounts receivable and certain foreign accounts receivable. The Revolving Line has a maturity date of March 26, 2021. In addition, the Revolving Loan Agreement provides for non-formula advances of up to \$10.0 million which may be made solely during the last five business days of any fiscal month or quarter and which must be repaid by us on or before the fifth business day after the applicable fiscal month or quarter end. Due to their repayment terms, non-formula advances do not provide us with usable liquidity.

The Revolving Loan Agreement, as amended, contains customary affirmative and negative covenants as well as customary events of default. The occurrence of an event of default could result in the acceleration of our obligations under the Revolving Loan Agreement, as amended, and an increase to the applicable interest rate, and would permit the Bank to exercise remedies with respect to its security interest. As of December 31, 2020, we were in compliance with all of the terms of the Revolving Loan Agreement, as amended.

As of December 31, 2020 and December 31, 2019, we had no outstanding borrowings under the Revolving Line.

Paycheck Protection Program Loan

On April 25, 2020, we entered into a loan with Silicon Valley Bank as the lender in an aggregate principal amount of \$0.8 million (the "Loan") pursuant to the Paycheck Protection Program (the "PPP") under the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act").

The Loan is evidenced by a promissory note (the "Note") dated April 25, 2020 and matures 2 years from the disbursement date. The Note bears interest at a rate of 1.000% per annum, with the first six months of interest deferred. Principal and interest are payable monthly commencing 6 months after the disbursement date and may be prepaid by the Company at any time prior to maturity with no prepayment penalties. The Note contains customary events of default relating to, among other things, payment defaults or breaches of the terms of the Note. Upon the occurrence of an event of default, the Lender may require immediate repayment of all amounts outstanding under the Note.

Under the terms of the CARES Act, PPP loan recipients can apply for and be granted forgiveness for all or a portion of loans granted under the PPP. The Loan is subject to forgiveness to the extent proceeds are used for payroll costs, including payments required to continue group health care benefits and certain rent, utility, and mortgage interest expenses (collectively, "Qualifying Expenses"), pursuant to the terms and limitations of the PPP. We used the Loan amount for Qualifying Expenses. During the fourth quarter of 2020, we applied for and received full forgiveness and have recorded a gain of \$0.8 million within other income in our consolidated statements of operations.

Equity Offering

On December 14, 2020, we completed the sale of 4,900,000 shares of common stock in an underwritten registered offering. On December 16, 2020, an additional 735,000 shares were issued pursuant to the 30-day over-allotment option exercised by the underwriter. With the over-allotment shares, a total of 5,635,000 shares of common stock were sold in the offering at a price to the public of \$2.45 per share. Net proceeds to the Company, after deducting underwriting discounts, commissions, and other expenses, were approximately \$12.7 million.

Private Placement Investment

On December 7, 2020, we completed a private placement of 724,288 shares of common stock to a certain accredited investor at a purchase price of \$2.071 per share. On December 15, 2020, we completed a private placement of 2,475,712 shares of common stock to a certain accredited investor at a purchase price of \$2.071. Net proceeds to the Company, after deducting commissions and other expenses, were approximately \$6.2 million.

At the Market Offering

On June 5, 2020, we entered into a sales agreement (the "Sales Agreement") with Cowen and Company, LLC ("Cowen"), pursuant to which we may issue and sell shares of the Company's common stock, par value \$0.001 per share, having an aggregate offering price of up to \$25,000, from time to time, through an "at the market" equity offering program under which Cowen will act as sales agent. Under the Sales Agreement, Cowen may sell the shares by methods deemed to be an "at the market offering" as defined in Rule 415(a)(4) promulgated under the Securities Act of 1933, as amended, including sales made by means of ordinary brokers' transactions on the Nasdaq Global Market or on any other existing trading market for the common stock or otherwise at market prices prevailing at the time of sale, in block transactions, or as otherwise directed by the Company. We pay Cowen a commission equal to three percent (3.0%) of the gross sales proceeds of any common stock sold through Cowen under the Sales Agreement. The Sales Agreement may be terminated by us upon prior notice to Cowen or by Cowen upon prior notice to us, or at any time under certain circumstances, including but not limited to the occurrence of a material adverse change in the Company. We are not obligated to sell any shares under the Sales Agreement.

During the year ended December 31, 2020, we sold an aggregate of 1,747,466 shares of our common stock under this at the market offering, resulting in aggregate net proceeds to us of approximately \$4.4 million, and gross proceeds of approximately \$4.9 million and paid Cowen commissions and fees of approximately \$0.2 million, and other expenses of \$0.3 million.

Liquidity

As of December 31, 2020, our cash, cash equivalents and short-term marketable securities balance of \$31.5 million was highly liquid. We anticipate that our existing working capital will be adequate to fund our operating, investing and financing needs for at least the next twelve months. We may pursue financing arrangements including the issuance of debt or equity securities or reduce expenditures, or both, to meet the Company's cash requirements, including in the longer term. There is no assurance that, if required, we will be able to raise additional capital or reduce discretionary spending to provide the required liquidity which, in turn, may have an adverse effect on our results of operations, financial position and cash flows.

From time to time, we evaluate acquisitions of businesses, products or technologies that complement our business. Any transactions, if consummated, may consume a material portion of our working capital or require the issuance of equity securities that may result in dilution to existing shareholders. Our ability to generate cash from operations is also subject to substantial risks described in Part I, "Item 1A., Risk Factors." If any of these risks occur, we may be unable to generate or sustain positive cash flow from operating activities. We would then be required to use existing cash and cash equivalents to support our working capital and other cash requirements. If additional funds are required to support our working capital requirements, acquisitions or other purposes, we may seek to raise funds through debt financing, equity financing or from other sources. If we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our shareholders could be significantly diluted, and these newly-issued securities may have rights, preferences or privileges senior to those of existing shareholders. 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 operating flexibility, and would also require us to incur interest expense. We can provide no assurance that additional financing will be available at all or, if available, that we would be able to obtain additional financing on terms favorable to us.

Critical Accounting Policies and Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires us to make estimates and judgments that affect the amounts reported. On an ongoing basis, we evaluate our estimates, including those related to revenue recognition, inventories, property and equipment, impairment of long-lived assets, valuation of goodwill, valuation of share-based payments, income taxes, litigation and other contingencies. We base our estimates on historical experience and various other assumptions that we believe to be reasonable under the circumstances. Actual results may differ from these estimates under different assumptions or conditions.

We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements:

Revenue Recognition - Revenue is recognized when control of the promised good or service is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. Our principal revenue generating activities consist of the following:

Product Sales - We sell integrated circuit products, also known as "chips" or "ICs", based upon a customer purchase order, which includes a fixed price per unit. We have elected to account for shipping and handling as activities to fulfill the promise to transfer the goods, and not evaluate whether these activities are promised services to the customer. We generally satisfy our single performance obligation upon shipment of the goods to the customer and recognize revenue at a point in time upon shipment of the underlying product.

Our shipments are subject to limited return rights subject to our limited warranty for our products sold. In addition, we may provide other credits to certain customers pursuant to price protection and stock rotation rights, all of which are considered variable consideration when estimating the amount of revenue to recognize. We use the "most likely amount" method to determine the amount of consideration to which we are entitled. Our estimate of variable consideration is reassessed at the end of each reporting period based on changes in facts and circumstances. Historically, returns and credits have not been material.

Engineering Services - We enter into contracts for professional engineering services that include software development and customization. We identify each performance obligation in our engineering services agreements ("ESAs") at contract inception. The ESA generally includes project deliverables specified by the customer. The performance obligations in the ESA are generally combined into one deliverable, with the pricing for services stated at a fixed amount. Services provided under the ESA generally result in the transfer of control over time. We recognize revenue on ESAs based on the proportion of labor hours expended to the total hours expected to complete the contract performance obligation. ESAs could include substantive customer acceptance provisions. In ESAs that include substantive customer acceptance provisions, we recognize revenue upon customer acceptance.

License Revenue - On occasion, we derive revenue from the license of our internally developed intellectual property ("IP"). IP licensing agreements that we enter into generally provide licensees the right to incorporate our IP components in their products with terms and conditions that vary by licensee. Fees under these agreements generally include license fees relating to our IP and support service fees, resulting in two performance obligations. We evaluate each performance obligation, which generally results in the transfer of control at a point in time for the license fee and over time for support services.

Other - From time-to-time, we enter into arrangements for other revenue generating activities, such as providing technical support services to customers through technical support agreements. In each circumstance, we evaluate such arrangements for our performance obligations which generally results in the transfer of control for such services over time. Historically, such arrangements have not been material to our operating results.

Inventory Valuation. We value inventory at the lower of cost or market. In addition, we write down any obsolete, unmarketable or otherwise impaired inventory to net realizable value. The determination of obsolete or excess inventory requires us to estimate the future demand for our products. The estimate of future demand is compared to inventory levels to determine the amount, if any, of obsolete or excess inventory. If actual market conditions are less favorable than those we projected at the time the inventory was written down, additional inventory write-downs may be required. Inventory valuation is re-evaluated on a quarterly basis.

Useful Lives and Recoverability of Equipment and Other Long-Lived Assets. We evaluate the recoverability of equipment and other assets, including identifiable intangible assets, whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. If there is an indicator of impairment, we prepare an estimate of future, undiscounted cash flows expected to result from the use of each asset and its eventual disposition. If these cash flows are less than the carrying value of the asset, we adjust the carrying amount of the asset to its estimated fair value. We have concluded that the carrying value of our long-lived assets is recoverable as of December 31, 2020.

Goodwill. Goodwill is not amortized, rather tested, at least annually, for impairment at a reporting unit level. Impairment of goodwill is the condition that exists when the carrying amount of a reporting unit that includes goodwill exceeds its fair value. A goodwill impairment loss is recognized for the amount that the carrying amount of the reporting unit, including goodwill, exceeds its fair value, limited to the total amount of goodwill allocated to that reporting unit. If the fair value of a reporting unit exceeds the carrying amount, goodwill of the reporting unit is not considered impaired.

We evaluate impairment using the guidance set forth in FASB Accounting Standards Update No. 2017-04, *Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment* ("ASU 2017-04") which states that an entity may first assess qualitative factors to determine whether it is necessary to perform the quantitative goodwill impairment test. If determined to be necessary, the quantitative impairment test shall be used to identify goodwill impairment and measure the amount of goodwill impairment loss to be recognized. An entity has an unconditional option to bypass the qualitative assessment for any reporting unit in any period and proceed directly to the quantitative goodwill impairment test. Accordingly, we have elected to bypass the qualitative assessment and proceed directly to the quantitative goodwill impairment test. We tested goodwill for impairment under the quantitative goodwill impairment test during the fourth quarter and concluded that goodwill was not impaired.

Stock-Based Compensation. Stock-based compensation expense is measured at the grant date, based on the estimated fair value of the award using the Black-Scholes option pricing model for stock options and market price for restricted stock units. The use of the Black-Scholes option pricing model, requires certain estimates, including expected term of options granted, the method of calculating expected volatilities and the risk-free interest rate used in the option-pricing model. The resulting calculated fair value of stock options is recognized as compensation expense over the requisite service period, which is generally the vesting period. When there are changes to the assumptions used in the option-pricing model, including fluctuations in the market price of our common stock, there will be variations in the calculated fair value of our future stock option awards, which results in variation in the stock-based compensation expensed recognized. Additionally, any modification of an award that increases its fair value will require us to recognize additional expense.

Income Taxes. We record deferred income taxes for temporary differences between the amount of assets and liabilities for financial and tax reporting purposes and we record a valuation allowance to reduce our deferred tax assets to the amount that is more likely than not to be realized. We also regularly conduct a comprehensive review of our uncertain tax positions. In this regard, an uncertain tax position represents our expected treatment of a tax position taken in a filed tax return, or planned to be taken in a future tax return, that has not been reflected in measuring income tax expense for financial reporting purposes. Until these positions are sustained by the taxing authorities, we do not recognize the tax benefits resulting from such positions and report the tax effects for uncertain tax positions in our consolidated balance sheets.

Contractual Payment Obligations

A summary of our contractual obligations as of December 31, 2020 is as follows:

Contractual Obligation	Payments Due By Period				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Operating leases	\$ 7,866	\$ 2,353	\$ 3,817	\$ 1,241	\$ 455
Estimated purchase commitments to contract manufacturers	3,678	3,678	—	—	—
Payments on accrued balances related to asset financings	1,607	829	778	—	—
Other purchase obligations and commitments	893	275	549	69	—
Total ¹	<u>\$ 14,044</u>	<u>\$ 7,135</u>	<u>\$ 5,144</u>	<u>\$ 1,310</u>	<u>\$ 455</u>

¹ We are unable to reliably estimate the timing of future payments related to uncertain tax positions and repatriation of foreign earnings; therefore, \$2.5 million of income taxes payable has been excluded from the table above.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements that have, or are reasonably likely to have, a material current or future effect on our financial condition, results of operations, liquidity, capital expenditures or capital resources.

Recent Accounting Pronouncements

See "Note 2: Summary of Significant Accounting Policies" in Part II, Item 8 of this Form 10-K for a description of recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on our consolidated financial statements.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

Not applicable.

Item 8. Financial Statements and Supplementary Data.

The following financial statements and reports are included in Item 8:

[Reports of Independent Registered Public Accounting Firms](#)
[Consolidated Balance Sheets as of December 31, 2020 and 2019](#)
[Consolidated Statements of Operations for the years ended December 31, 2020 and 2019](#)
[Consolidated Statements of Comprehensive Loss for the years ended December 31, 2020 and 2019](#)
[Consolidated Statements of Cash Flows for the years ended December 31, 2020 and 2019](#)
[Consolidated Statements of Shareholders' Equity for the years ended December 31, 2020 and 2019](#)
[Notes to Consolidated Financial Statements](#)

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders
Pixelworks, Inc.
San Jose, California

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Pixelworks, Inc. and its subsidiaries (the Company) as of December 31, 2020, and the related consolidated statements of operations, comprehensive loss, shareholders' equity, and cash flows for the year ended December 31, 2020, and the related notes (collectively referred to as the consolidated financial statements).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2020, and the results of its operations and its cash flows for the year ended December 31, 2020 in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

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

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

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

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Revenue Recognition — Refer to Note 2 to the Consolidated Financial Statements

Critical Audit Matter Description

The Company recognizes revenue upon transfer of control of promised products or services to customers in an amount that reflects the consideration the Company expects to receive in exchange for those products or services. The Company's contract may contain one or more performance obligations, including hardware, professional engineering services, internally developed intellectual property ("IP") and technical support services.

Significant judgment is exercised by the Company in determining revenue recognition for these customer agreements, and includes the following:

- Determination of whether products and services are considered distinct performance obligations that should be accounted for separately versus together.
- Determination of stand-alone selling prices for each distinct performance obligation (i.e. for IP license fee and support service fee that are sold together under IP licensing arrangements).
- The pattern of delivery (i.e., timing of when revenue is recognized) for each distinct performance obligation.
- Estimation of variable consideration when determining the amount of revenue to recognize, primarily on product sale arrangements (e.g., customer credits pursuant to price protection rights, stock rotation rights and limited return rights).

Given these factors, the related audit effort in evaluating management's judgments in determining revenue recognition for these customer agreements was extensive and required a high degree of auditor judgment.

How the Critical Audit Matter Was Addressed in the Audit

Our principal audit procedures related to the Company's revenue recognition for these customer agreements included the following:

- We selected a sample of customer agreements and performed the following procedures:
 - Obtained and read contract source documents for each selection, including master agreements, and other documents that were part of the agreement to identify significant terms.
 - Tested management's identification of significant terms for completeness, including the identification of distinct performance obligations and variable consideration.
 - Assessed the terms in the customer agreement and evaluated the appropriateness of management's application of their accounting policies, along with their use of estimates, in the determination of revenue recognition conclusions.
- We evaluated the reasonableness of management's estimate of stand-alone selling prices for products and services that are not sold separately.
- We evaluated the reasonableness and accuracy of management's judgements and estimates used in accounting for customer credits pursuant to price protection rights, stock rotation rights and limited return rights ("variable consideration"). This included testing management's estimate of calculating expected credits issued to customers and determining whether such credits were completely and accurately reserved as of December 31, 2020.

We tested the mathematical accuracy of management's calculations of revenue and the associated timing of recognizing the related revenue subject to any constraints in the consolidated financial statements.

Inventory Valuation— Refer to Note 2 to the Financial Statements

Critical Audit Matter Description

The Company computes inventory cost on a first-in-first out basis and applies judgment in determining the forecast for products and the valuation of inventories. The Company assesses inventory at each reporting date in order to assert that it is recorded at net realizable value, giving consideration to, among other factors: whether the product is valued at the lower of cost or net realizable value; and the estimation of excess and obsolete inventory or that which is not of saleable quality. Most of the Company's inventory provisions are based on the Company's inventory levels and future product purchase commitments compared to assumptions about future demand and market conditions.

Significant judgment is exercised by the Company to determine inventory carrying value adjustments, specifically the provisions for excess or obsolete inventories, and includes the following:

- Developing assumptions such as forecasts of future sales quantities, which are sensitive to the competitiveness of product offerings, customer requirements, and product life cycles.
- Applying management judgment on not reserving certain inventory units (e.g. in case they are items that can be used for Return Merchandise Authorization "RMA"/warranty purpose)

Given these factors and assumptions are forward-looking and could be affected by future economic and market conditions, the related audit effort to evaluate management's inventory valuation adjustments was extensive and required a high degree of auditor judgment.

How the Critical Audit Matter Was Addressed in the Audit

Our principal audit procedures related to the Company's inventory valuation methodology included the following:

- We selected a sample of inventory items and performed the following procedures:
 - Tested the mathematical accuracy of the schedule by comparing the quantities and carrying value of on-hand inventories to related unit sales, both historical and forecasted.
 - Assessed and tested the reasonableness of the significant assumptions (e.g. sales and marketing forecast, build plans, RMA requirements, usage and open sales-orders).
 - Inquired with the management team and evaluated the adequacy of management's sales forecasts by analyzing potential technological changes in line with product life cycles and/or identified alternative customer uses.

Assessed whether there were any potential sources of contrary information, including historical forecast accuracy or history of significant revisions to previously recorded inventory valuation adjustments, and performed sensitivity analyses over significant assumptions to evaluate the changes in inventory valuation that would result from changes in the assumptions.

/s/ Armanino^{LLP}

We have served as the Company's auditor since 2020.

San Ramon, California
March 10, 2021

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Pixelworks, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Pixelworks, Inc. and subsidiaries (the Company) as of December 31, 2019, the related consolidated statements of operations, comprehensive loss, shareholders' equity, and cash flows for the year ended December 31, 2019, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019, and the results of its operations and its cash flows for the year ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ KPMG LLP

We served as the Company's auditor from 1997 to 2020.

Portland, Oregon
March 11, 2020

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

	December 31,	
	2020	2019
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 31,257	\$ 7,257
Short-term marketable securities	250	6,975
Accounts receivable, net	4,672	10,915
Inventories	2,445	5,401
Prepaid expenses and other current assets	1,010	1,689
Total current assets	39,634	32,237
Property and equipment, net	5,103	4,608
Operating lease right-of-use assets	6,606	5,434
Other assets, net	1,081	1,267
Acquired intangible assets, net	1,207	2,704
Goodwill	18,407	18,407
Total assets	\$ 72,038	\$ 64,657
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 995	\$ 818
Accrued liabilities and current portion of long-term liabilities	9,452	8,692
Current portion of income taxes payable	147	164
Total current liabilities	10,594	9,674
Long-term liabilities, net of current portion	1,007	982
Operating lease liabilities, net of current portion	5,088	4,212
Income taxes payable, net of current portion	2,479	2,260
Total liabilities	19,168	17,128
Commitments and contingencies (Note 10)		
Shareholders' equity:		
Preferred stock, \$0.001 par value, 50,000,000 shares authorized, none issued	—	—
Common stock, \$0.001 par value; 250,000,000 shares authorized, 51,078,942 and 38,434,488 shares issued and outstanding as of December 31, 2020 and 2019, respectively.	467,957	436,122
Accumulated other comprehensive income	47	12
Accumulated deficit	(415,134)	(388,605)
Total shareholders' equity	52,870	47,529
Total liabilities and shareholders' equity	\$ 72,038	\$ 64,657

See accompanying notes to consolidated financial statements.

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

	Year Ended December 31,	
	2020	2019
Revenue, net	\$ 40,855	\$ 68,755
Cost of revenue (1)	20,670	34,260
Gross profit	20,185	34,495
Operating expenses:		
Research and development (2)	25,040	26,018
Selling, general and administrative (3)	19,840	21,202
Restructuring	2,041	398
Total operating expenses	46,921	47,618
Loss from operations	(26,736)	(13,123)
Interest income and other, net	9	594
Gain on loan extinguishment	796	—
Gain on sale of patents	—	3,905
Total other income, net	805	4,499
Loss before income taxes	(25,931)	(8,624)
Provision for income taxes	598	453
Net loss	\$ (26,529)	\$ (9,077)
Net loss per share - basic and diluted	\$ (0.65)	\$ (0.24)
Weighted average shares outstanding - basic and diluted	40,712	37,851
(1) Includes:		
Amortization of acquired intangible assets	1,192	1,192
Stock-based compensation	432	367
Restructuring	173	—
Inventory step-up and backlog amortization	—	12
(2) Includes stock-based compensation	2,943	2,545
(3) Includes:		
Stock-based compensation	4,296	3,737
Amortization of acquired intangible assets	304	312

See accompanying notes to consolidated financial statements.

PIXELWORKS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In thousands)

	Year Ended December 31,	
	2020	2019
Net loss	\$ (26,529)	\$ (9,077)
Other comprehensive income (loss):		
Foreign pension adjustment	48	(7)
Unrealized gain (loss) on available-for-sale securities	(3)	3
Tax effect of foreign pension adjustment	(10)	1
Total comprehensive loss	<u>\$ (26,494)</u>	<u>\$ (9,080)</u>

See accompanying notes to consolidated financial statements.

PIXELWORKS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,	
	2020	2019
Cash flows from operating activities:		
Net loss	\$ (26,529)	\$ (9,077)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation	7,853	6,649
Depreciation and amortization	3,737	3,837
Amortization of acquired intangible assets	1,496	1,504
Gain on loan extinguishment	(796)	—
Reversal of uncertain tax positions	(88)	(124)
Deferred income tax expense	26	45
Accretion on short-term marketable securities	(4)	(94)
Gain on sale of marketable securities	(4)	—
Gain on sale of patents	—	(3,905)
Inventory step-up and backlog amortization	—	12
Other	9	(3)
Changes in operating assets and liabilities:		
Accounts receivable, net	6,243	(3,933)
Inventories	2,956	(2,459)
Prepaid expenses and other current and long-term assets, net	3,295	2,172
Accounts payable	166	(1,304)
Accrued current and long-term liabilities	(2,361)	(3,686)
Income taxes payable	290	(14)
Net cash used in operating activities	(3,711)	(10,380)
Cash flows from investing activities:		
Proceeds from sales and maturities of marketable securities	8,229	10,050
Purchases of property and equipment	(2,637)	(2,629)
Purchases of available-for-sale marketable securities	(1,500)	(10,856)
Purchases of licensed technology	(152)	(521)
Proceeds from sale of patents	—	4,250
Payment associated with sale of patents	—	(345)
Net cash used in (provided by) investing activities	3,940	(51)
Cash flows from financing activities:		
Net proceeds from equity offering	12,743	—
Net proceeds from private placement investment	6,210	—
Net proceeds from "at the market" equity offering	4,429	—
Payments on asset financings	(1,007)	(826)
Proceeds from Paycheck Protection Program loan	796	—
Proceeds from issuances of common stock under employee equity incentive plans	600	570
Net cash provided by (used in) financing activities	23,771	(256)
Net increase (decrease) in cash and cash equivalents	24,000	(10,687)
Cash and cash equivalents, beginning of period	7,257	17,944
Cash and cash equivalents, end of period	\$ 31,257	\$ 7,257
Supplemental disclosure of cash flow information:		
Cash paid for income taxes, net of refunds received	\$ 397	\$ 547
Cash paid during the year for interest	217	142
Non-cash investing and financing activities:		
Gain on loan extinguishment	\$ (796)	\$ —
Acquisitions of property and equipment and other assets under extended payment terms	1,495	934

See accompanying notes to consolidated financial statements.

PIXELWORKS, INC.
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY
(In thousands, except share data)

	Common Stock		Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Shareholders' Equity
	Shares	Amount			
Balance as of December 31, 2018	36,937,458	428,903	15	(379,528)	49,390
Stock issued under employee equity incentive plans	1,497,030	570	—	—	570
Stock-based compensation expense	—	6,649	—	—	6,649
Unrealized gain on available-for-sale securities	—	—	3	—	3
Net loss	—	—	—	(9,077)	(9,077)
Foreign pension adjustment, net of tax of \$(1)	—	—	(6)	—	(6)
Balance as of December 31, 2019	38,434,488	436,122	12	(388,605)	47,529
Stock issued under employee equity incentive plans	2,061,988	600	—	—	600
Equity offering	5,635,000	12,743	—	—	12,743
Private placement investment	3,200,000	6,210	—	—	6,210
"At the market" equity offering	1,747,466	4,429	—	—	4,429
Stock-based compensation expense	—	7,853	—	—	7,853
Unrealized loss on available-for-sale securities	—	—	(3)	—	(3)
Net loss	—	—	—	(26,529)	(26,529)
Foreign pension adjustment, net of tax of \$10	—	—	38	—	38
Balance as of December 31, 2020	51,078,942	\$ 467,957	\$ 47	\$ (415,134)	\$ 52,870

See accompanying notes to consolidated financial statements.

PIXELWORKS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(In thousands, except share and per share data)

NOTE 1. BASIS OF PRESENTATION

Nature of Business

Pixelworks is a leading provider of high-performance and power-efficient visual processing solutions that bridge the gap between video content formats and rapidly advancing display capabilities. We develop and market semiconductor and software solutions that enable consistently high-quality, authentic viewing experiences in a wide variety of applications from cinema to smartphones. Our primary target markets include Mobile (smartphone, gaming and tablet), Home Entertainment (TV, personal video recorder ("PVR"), over-the-air ("OTA") and projector), Content (creation, remastering and delivery), and Business & Education (projector).

As of December 31, 2020, we had an intellectual property portfolio of 338 patents related to the visual display of digital image data. We focus our research and development efforts on developing video algorithms that improve quality, and architectures that reduce system power, cost, bandwidth and increase overall system performance and device functionality. We seek to expand our technology portfolio through internal development and co-development with business partners, and we continually evaluate acquisition opportunities and other ways to leverage our technology into other high-value markets.

Pixelworks was founded in 1997 and is incorporated under the laws of the state of Oregon. On August 2, 2017, we acquired ViXS Systems, Inc., a corporation organized in Canada ("ViXS") ("the Acquisition").

Our consolidated financial statements include the accounts of Pixelworks and its wholly-owned subsidiaries. Intercompany accounts and transactions have been eliminated. All foreign subsidiaries use the U.S. dollar as the functional currency, and as a result, transaction gains and losses are included in the consolidated statements of operations. Transaction losses were \$419 and \$270 for the years ended December 31, 2020 and 2019, respectively.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. generally accepted accounting principles ("U.S. GAAP") requires us to make estimates and judgments that affect amounts reported in the financial statements and accompanying notes. Our significant estimates and judgments include those related to revenue recognition, valuation of excess and obsolete inventory, lives and recoverability of equipment and other long-lived assets, valuation of goodwill, stock-based compensation and income taxes. The actual results experienced could differ materially from our estimates.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Cash and Cash Equivalents

We classify all cash and highly liquid investments with original maturities of three months or less at the date of purchase as cash and cash equivalents. Cash equivalents, which as of December 31, 2020 and 2019 consisted of U.S. denominated money market funds, totaled \$23,832 and \$1,307 as of December 31, 2020 and 2019, respectively.

Marketable Securities

Our investments in marketable securities are classified as available-for-sale. Available-for-sale securities are stated at fair value based on quoted market prices with unrealized holding gains or losses, net of tax, included in accumulated other comprehensive income, a component of shareholders' equity. The cost of securities sold is based on the specific identification method.

Accounts Receivable

Accounts receivable are recorded at invoiced amount and do not bear interest when recorded or accrue interest when past due. We maintain an allowance for doubtful accounts for estimated losses that may result from the inability of our customers to make required payments. At the end of each reporting period, we estimate the allowance for doubtful accounts based on an account-by-account risk analysis of outstanding receivable balances. The determination to write-off specific accounts receivable balances is made based on the likelihood of collection and past due status. Past due status is based on invoice date and terms specific to each customer.

Inventories

Inventories consist of finished goods and work-in-process, and are stated at the lower of standard cost (which approximates actual cost on a first-in, first-out basis) or market (net realizable value).

Property and Equipment

Property and equipment are stated at cost. Depreciation and amortization is calculated on a straight-line basis over the estimated useful life of the assets which are generally as follows:

Software	Lesser of 3 years or contractual license term
Equipment, furniture and fixtures	2 years
Tooling	2 to 4 years
Leasehold improvements	Lesser of lease term or estimated useful life

The cost of property and equipment repairs and maintenance is expensed as incurred.

Licensed Technology

We have capitalized licensed technology assets in other long-term assets. These assets are stated at cost and are amortized on a straight-line basis over the term of the license or the estimated life of the asset, if the license is not contractually limited, which is generally two to five years.

Useful Lives and Recoverability of Equipment and Other Long-Lived Assets

We evaluate the remaining useful life and recoverability of equipment and other assets, including identifiable intangible assets, whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. If there is an indicator of impairment, we prepare an estimate of future, undiscounted cash flows expected to result from the use of each asset and its eventual disposition. If these cash flows are less than the carrying value of the asset, we adjust the carrying amount of the asset to its estimated fair value. We have concluded that the carrying value of our long-lived assets is recoverable as of December 31, 2020.

Goodwill

Goodwill is not amortized, rather it is tested, at least annually, for impairment at a reporting unit level. Impairment of goodwill is the condition that exists when the carrying amount of a reporting unit that includes goodwill exceeds its fair value. A goodwill impairment loss is recognized for the amount that the carrying amount of the reporting unit, including goodwill, exceeds its fair value, limited to the total amount of goodwill allocated to that reporting unit. If the fair value of a reporting unit exceeds the carrying amount, goodwill of the reporting unit is not considered impaired.

We evaluate impairment using the guidance set forth in FASB Accounting Standards Update No. 2017-04, *Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment* ("ASU 2017-04") which states that an entity may first assess qualitative factors to determine whether it is necessary to perform the quantitative goodwill impairment test. If determined to be necessary, the quantitative impairment test shall be used to identify goodwill impairment and measure the amount of goodwill impairment loss to be recognized. An entity has an unconditional option to bypass the qualitative assessment for any reporting unit in any period and proceed directly to the quantitative goodwill impairment test. Accordingly, we have elected to bypass the qualitative assessment and proceed directly to the quantitative goodwill impairment test. We tested goodwill for impairment under the quantitative goodwill impairment test during the fourth quarter of 2020 and concluded that goodwill was not impaired.

Warranty Program

We warrant that our products will be free from defects in material and workmanship for a period of twelve months from delivery. Warranty repairs are guaranteed for the remainder of the original warranty period. Our warranty is limited to repairing or replacing products, or refunding the purchase price. At the end of each reporting period, we estimate a reserve for warranty returns based on historical experience and knowledge of any applicable events or transactions. The reserve for warranty returns is included in accrued liabilities in our consolidated balance sheets.

Stock-Based Compensation

We currently sponsor a stock incentive plan that allows for issuance of employee stock options and restricted stock awards, including restricted stock units. We also have an employee stock purchase plan for all eligible employees. The fair value of share-based payment awards is expensed straight-line over the requisite service period, which is generally the vesting period, for the entire award. Additionally, any modification of an award that increases its fair value will require us to recognize additional expense.

The fair value of our stock option grants and purchase rights under our employee stock purchase plan are estimated as of the grant date using the Black-Scholes option pricing model which is affected by our estimates of the risk free interest rate, our expected dividend yield, expected term and the expected share price volatility of our common shares over the expected term. The fair value of our restricted stock awards are based on the market value of our stock on the date of grant.

Research and Development

Costs associated with research and development activities are expensed as incurred, except for items with alternate future uses which are capitalized and depreciated over their estimated useful lives.

On occasion, we enter into co-development arrangements with current or prospective customers to defray a portion of the research and development expenses we expect to incur in connection with our development of an IC product. As amounts become due and payable, they are offset against research and development expense on a pro-rata basis.

Income Taxes

We account for income taxes under the asset and liability method. This approach requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of temporary differences between financial statement carrying amounts and tax bases of assets and liabilities. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. We establish a valuation allowance to reduce deferred tax assets if it is "more likely than not" that a portion or all of the asset will not be realized in future tax returns.

An uncertain tax position represents treatment of a tax position taken in a filed tax return, or planned to be taken in a future tax return, that has not been reflected in measuring income tax expense for financial reporting purposes. Until these positions are sustained by the taxing authorities, we do not recognize the tax benefits resulting from such positions and report the tax effects for uncertain tax positions in our consolidated balance sheets.

Risks and Uncertainties

Concentration of Suppliers

We do not own or operate a semiconductor fabrication facility and do not have the resources to manufacture our products internally. We rely on a limited number of foundries and assembly and test vendors to produce all of our wafers and for completion of finished products. We do not have any long-term agreements with any of these suppliers. In light of these dependencies, it is reasonably possible that failure to perform by one of these suppliers could have a severe impact on our results of operations. Additionally, the concentration of these vendors within Taiwan, and the People's Republic of China increases our risk of supply disruption due to natural disasters, economic instability, political unrest or other regional disturbances.

Risk of Technological Change

The markets in which we compete, or seek to compete, are subject to rapid technological change, frequent new product introductions, changing customer requirements for new products and features, and evolving industry standards. The introduction of new technologies and the emergence of new industry standards could render our products less desirable or obsolete, which could harm our business.

Concentrations of Credit Risk

Financial instruments that potentially subject us to concentrations of credit risk consist of cash equivalents and accounts receivable. We limit our exposure to credit risk associated with cash equivalent balances by holding our funds in high quality, highly liquid money market accounts. We limit our exposure to credit risk associated with accounts receivable by carefully evaluating creditworthiness before offering terms to customers.

Recent Accounting Pronouncements

In December 2019, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update No. 2019-12, *Simplifying the Accounting for Income Taxes* ("ASU 2019-12"). ASU 2019-12 removes certain exceptions to the general principles in Accounting Standards Codification ("ASC") 740 and also clarifies and amends existing guidance to provide for more consistent application. ASU 2019-12 will become effective for us in the first quarter of fiscal 2021, and early adoption is permitted. We are evaluating the impact that the adoption of ASU 2019-12 will have on our financial position, results of operations and cash flows, but don't estimate the impact to be significant.

In November 2018, the FASB issued Accounting Standards Update No. 2018-18, *Collaborative Arrangements: Clarifying the Interaction Between Topic 808 and Topic 606* ("ASU 2018-18"). ASU 2018-18 requires transactions in collaborative arrangements to be accounted for under ASC 606 if the counterparty is a customer for a good or service (or bundle of goods and services) that is a distinct unit of account. The amendment also precludes entities from presenting consideration from transactions with a collaborator that is not a customer together with revenue recognized from contracts with customers. ASU 2018-18 became effective for us on January 1, 2020. The adoption of ASU 2018-18 did not have a material impact on our financial position, results of operations and cash flows.

NOTE 3. BALANCE SHEET COMPONENTS**Accounts Receivable, Net**

Accounts receivable consists of the following:

	December 31,	
	2020	2019
Accounts receivable, gross	\$ 4,713	\$ 10,938
Allowance for doubtful accounts	(41)	(23)
Accounts receivable, net	\$ 4,672	\$ 10,915

The following is a summary of the change in our allowance for doubtful accounts:

	Year Ended December 31,	
	2020	2019
Balance at beginning of year	\$ 23	\$ 21
Additions charged	18	2
Balance at end of year	\$ 41	\$ 23

Inventories

Inventories consist of the following:

	December 31,	
	2020	2019
Finished goods	\$ 1,775	\$ 1,630
Work-in-process	670	3,771
Inventories	\$ 2,445	\$ 5,401

We recorded inventory write-downs of \$95 and \$137 for the years ended December 31, 2020 and 2019, respectively. The inventory write-downs were for lower of cost or market and excess and obsolescence exposure. The inventory write-downs were offset by sales of previously written-down inventory of \$29 and \$35 for the years ended December 31, 2020 and 2019, respectively.

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consist of current prepaid expenses, deposits, income taxes receivable and other receivables.

Property and Equipment, Net

Property and equipment consists of the following:

	December 31,	
	2020	2019
Equipment, furniture and fixtures	\$ 8,889	\$ 8,494
Tooling	6,298	6,552
Software	5,711	6,428
Leasehold improvements	1,393	1,392
	<u>22,291</u>	<u>22,866</u>
Accumulated depreciation and amortization	(17,188)	(18,258)
Property and equipment, net	<u>\$ 5,103</u>	<u>\$ 4,608</u>

Software amortization was \$1,174 and \$1,320 for the years ended December 31, 2020 and 2019, respectively. Depreciation and amortization expense for equipment, furniture, fixtures, tooling and leasehold improvements was \$2,227 and \$2,300 for the years ended December 31, 2020 and 2019, respectively.

Other Assets, Net

Other assets consist primarily of deposits, deferred tax assets and licensed technology. Amortization of licensed technology was \$336 and \$217 for the years ended December 31, 2020 and 2019, respectively.

Acquired Intangible Assets, Net

In connection with the Acquisition, we recorded certain identifiable intangible assets. Acquired intangible assets resulting from this transaction consist of the following:

	December 31,	
	2020	2019
Developed technology	\$ 5,050	\$ 5,050
Customer relationships	1,270	1,270
Backlog and tradename	410	410
	<u>6,730</u>	<u>6,730</u>
Less: accumulated amortization	(5,523)	(4,026)
Acquired intangible assets, net	<u>\$ 1,207</u>	<u>\$ 2,704</u>

Intangible assets are amortized over the following estimated useful lives: developed technology and customer relationships, 3 to 5 years; tradename and backlog, 6 to 18 months. Backlog was fully amortized as of December 31, 2018 and tradename was fully amortized as of December 31, 2019.

Amortization expense for intangible assets was \$1,496 for the year ended December 31, 2020, with \$1,192 included in cost of revenue and \$304 included in selling, general and administrative on the consolidated statements of operations. As of December 31, 2020, future estimated amortization expense is as follows:

Years ending December 31:	
2021	\$ 1,117
2022	90
	<u>\$ 1,207</u>

Acquired intangible assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. Conditions that would trigger an impairment assessment include, but are not limited to, past, current, or expected cash flow or operating losses associated with the asset. There were no such triggering events requiring an impairment assessment of other intangible assets as of December 31, 2020.

Goodwill

Goodwill resulted from the Acquisition, whereby we recorded goodwill of \$18,407. See Note 2: "Summary of Significant Accounting Policies" for information on our assessment of goodwill impairment.

Accrued Liabilities and Current Portion of Long-Term Liabilities

Accrued liabilities and current portion of long-term liabilities consist of the following:

	December 31,	
	2020	2019
Accrued payroll and related liabilities	\$ 2,867	\$ 3,440
Operating lease liability, current	2,039	1,545
Current portion of accrued liabilities for asset financings	786	483
Accrued costs related to restructuring	630	66
Accrued commissions and royalties	474	663
Accrued interest payable	429	397
Deferred revenue	179	146
Other	2,048	1,952
Accrued liabilities and current portion of long-term liabilities	<u>\$ 9,452</u>	<u>\$ 8,692</u>

The following is a summary of the change in deferred revenue:

	Year Ended December 31,	
	2020	2019
Deferred revenue:		
Balance at beginning of period	\$ 146	\$ 96
Revenue deferred	935	511
Revenue recognized	(902)	(461)
Balance at end of period	<u>\$ 179</u>	<u>\$ 146</u>

Short-Term Line of Credit

On December 21, 2010, we entered into a Loan and Security Agreement with Silicon Valley Bank (the "Bank"), which was amended on December 14, 2012, December 4, 2013, December 18, 2015, December 15, 2016, July 21, 2017, December 21, 2017, December 18, 2018, December 18, 2019, April 17, 2020 and December 14, 2020 (as amended, the "Revolving Loan Agreement"). The Revolving Loan Agreement provides a secured working capital-based revolving line of credit (the "Revolving Line") in an aggregate amount of up to the lesser of (i) \$10,000, or (ii) \$2,500 plus 80% of eligible domestic accounts receivable and certain foreign accounts receivable. The Revolving Line has a maturity date of March 26, 2021. In addition, the Revolving Loan Agreement provides for non-formula advances of up to \$10,000 which may be made solely during the last five business days of any fiscal month or quarter and which must be repaid by the Company on or before the fifth business day after the applicable fiscal month or quarter end.

Amounts advanced under the Revolving Line bear interest at an annual rate equal to the lender's prime rate plus 0.25%. The Revolving Loan Agreement, as amended also provides an option for LIBOR advances that bear interest based on the LIBOR rate, subject to the availability of a LIBOR rate. Interest on the Revolving Line is due monthly, with the balance due on March 26, 2021, which is the scheduled maturity date for the Revolving Line.

The Revolving Loan Agreement, as amended contains customary affirmative and negative covenants, including with respect to the following: compliance with laws, provision of financial statements and periodic reports, payment of taxes, maintenance of inventory and insurance, maintenance of operating accounts at the Bank, the Bank's access to collateral, formation or acquisition of subsidiaries, incurrence of indebtedness, dispositions of assets, granting liens, changes in business, ownership or business locations, engaging in mergers and acquisitions, making investments or distributions and affiliate transactions. The covenants also require that the Company maintain a minimum ratio of qualifying financial assets to the sum of qualifying financial obligations.

The Revolving Loan Agreement, as amended also contains customary events of default, including the following: defaults with respect to covenant compliance, the occurrence of a material adverse change, the occurrence of certain bankruptcy or insolvency events, cross-defaults, judgment defaults and material misrepresentations. The occurrence of an event of default could result in the acceleration of the Company's obligations under the Revolving Loan Agreement, as amended and an increase to the applicable interest rate, and would permit the Bank to exercise remedies with respect to its security interest.

To secure the repayment of any amounts borrowed under the Revolving Loan Agreement, as amended, the Company granted to the Bank a security interest in substantially all of its assets, excluding its intellectual property assets. The Company has agreed not to pledge or otherwise encumber its intellectual property assets without prior written permission from the Bank.

As of December 31, 2020 and December 31, 2019, we had no outstanding borrowings on the Revolving Line.

Paycheck Protection Program Loan

On April 25, 2020, we entered into a loan with Silicon Valley Bank as the lender in an aggregate principal amount of \$796 (the "Loan") pursuant to the Paycheck Protection Program (the "PPP") under the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act").

The Loan is evidenced by a promissory note (the "Note") dated April 25, 2020, and matures 2 years from the disbursement date. The Note bears interest at a rate of 1.000% per annum, with the first six months of interest deferred. Principal and interest are payable monthly commencing 6 months after the disbursement date and may be prepaid by the Company at any time prior to maturity with no prepayment penalties. The Note contains customary events of default relating to, among other things, payment defaults or breaches of the terms of the Note. Upon the occurrence of an event of default, the Lender may require immediate repayment of all amounts outstanding under the Note.

Under the terms of the CARES Act, PPP loan recipients can apply for and be granted forgiveness for all or a portion of loans granted under the PPP. The Loan is subject to forgiveness to the extent proceeds are used for payroll costs, including payments required to continue group health care benefits, and certain rent, utility, and mortgage interest expenses (collectively, "Qualifying Expenses"), pursuant to the terms and limitations of the PPP. We used the Loan amount for Qualifying Expenses. During the fourth quarter of 2020, we applied for and received full forgiveness and have recorded a gain of \$796 within other income in our consolidated statements of operations.

NOTE 4. MARKETABLE SECURITIES AND FAIR VALUE MEASUREMENTS**Marketable Securities**

As of December 31, 2020 and December 31, 2019, all of our marketable securities are classified as available-for-sale and consist of the following:

	Cost	Unrealized Gain (Loss)	Fair Value
Short-term marketable securities:			
As of December 31, 2020:			
Corporate debt securities	\$ 253	\$ (3)	\$ 250
	<u>\$ 253</u>	<u>\$ (3)</u>	<u>\$ 250</u>
As of December 31, 2019:			
Commercial paper	\$ 2,487	\$ —	\$ 2,487
U.S. government treasury bills	2,249	1	2,250
Corporate debt securities	2,236	2	2,238
	<u>\$ 6,972</u>	<u>\$ 3</u>	<u>\$ 6,975</u>

Unrealized holding gains and losses are recorded in accumulated other comprehensive income, a component of shareholders' equity, in the consolidated balance sheets.

Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Three levels of inputs may be used to measure fair value:

- Level 1: Valuations based on quoted prices in active markets for identical assets and liabilities.
- Level 2: Valuations based on inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3: Valuations based on unobservable inputs in which there is little or no market data available, which require the reporting entity to develop its own assumptions.

The following table presents information about our assets and liabilities measured at fair value on a recurring basis in the consolidated balance sheets as of December 31, 2020 and 2019:

	Level 1	Level 2	Level 3	Total
As of December 31, 2020:				
Assets:				
Cash equivalents:				
Money market funds	\$ 23,832	\$ —	\$ —	\$ 23,832
Short-term marketable securities:				
Corporate debt securities	—	250	—	250
As of December 31, 2019:				
Assets:				
Cash equivalents:				
Money market funds	\$ 1,307	\$ —	\$ —	\$ 1,307
Short-term marketable securities:				
U.S. government treasury bills	2,250	—	—	2,250
Commercial paper	—	2,487	—	2,487
Corporate debt securities	—	2,238	—	2,238

We primarily use the market approach to determine the fair value of our financial instruments. The fair value of our current assets and liabilities, including accounts receivable and accounts payable approximates the carrying value due to the short-term nature of these balances. We have currently chosen not to elect the fair value option for any items that are not already required to be measured at fair value in accordance with U.S. GAAP.

NOTE 5: RESTRUCTURINGS

In August 2020, we executed a restructuring plan to make the operation of the Company more efficient (the "August 2020 Plan"). The August 2020 Plan included an approximately 14% reduction in workforce, primarily in the areas of operations, research and development, sales and marketing.

In January 2020, we executed a restructuring plan to make the operation of the Company more efficient (the "January 2020 Plan"). The January 2020 Plan included an approximately 4% reduction in workforce, primarily in the areas of research and development and sales.

In June 2019, we executed a restructuring plan to make the operation of the Company more efficient (the "2019 Plan"). The 2019 plan included an approximately 2% reduction in workforce, primarily in the areas of sales and operations.

Total restructuring expense included in our statement of operations for the years ended December 31, 2020 and 2019 is comprised of the following:

	Year Ended December 31,	
	2020	2019
Cost of revenue — restructuring:		
Employee severance and benefits	\$ 173	\$ —
	173	—
Operating expenses — restructuring:		
Employee severance and benefits	\$ 2,041	\$ 398
	2,041	398
Total restructuring expense	\$ 2,214	\$ 398

The following is a rollforward of the accrued liabilities related to restructuring for the year ended December 31, 2020:

	Balance as of December 31, 2019	Expensed	Payments	Balance as of December 31, 2020
Employee severance and benefits	\$ 66	\$ 2,214	\$ (1,650)	\$ 630
Accrued costs related to restructuring	\$ 66	\$ 2,214	\$ (1,650)	\$ 630

NOTE 6: LEASES

On January 1, 2019, we adopted the new requirements of ASC 842, under the modified retrospective approach, using the effective date method. Under the effective date method, financial information and disclosures prior to January 1, 2019 are not required to be restated.

We determine if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, other current liabilities, and operating lease liabilities in our consolidated balance sheets.

ROU assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As most of our leases do not provide an implicit rate, we use our incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments. Operating lease ROU assets also exclude lease incentives received. For purposes of calculating operating lease liabilities, lease terms may be deemed to include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option.

We have operating leases for office buildings and one vehicle. Our leases have remaining lease terms of 1 year to 7 years. Supplemental information related to lease expense and valuation of the ROU assets and lease liabilities was as follows:

	Year Ended December 31, 2020	Year Ended December 31, 2019
Operating lease cost	\$ 2,721	\$ 2,496
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	2,816	2,697
Leased assets obtained in exchange for new operating lease liabilities	3,535	1,440
Weighted average remaining lease term (in years)	3.76	4.97
Weighted average discount rate	4.99 %	5.49 %

Future minimum lease payments under non-cancellable leases as of December 31, 2020 were as follows:

Operating Lease Payments

Years ending December 31:		
2021	\$	2,353
2022		2,475
2023		1,342
2024		877
2025		364
2026		364
Thereafter		91
Total operating lease payments		7,866
Less imputed interest		(739)
Total operating lease liabilities	\$	7,127

As of December 31, 2020, the Company had no operating lease liabilities that had not commenced.

NOTE 7: REVENUE

Revenue is recognized when control of the promised good or service is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. Our principal revenue generating activities consist of the following:

Product Sales - We sell integrated circuit products, also known as “chips” or “ICs”, based upon a customer purchase order, which includes a fixed price per unit. We have elected to account for shipping and handling as activities to fulfill the promise to transfer the goods, and not evaluate whether these activities are promised services to the customer. We generally satisfy our single performance obligation upon shipment of the goods to the customer and recognize revenue at a point in time upon shipment of the underlying product.

Our shipments are subject to limited return rights subject to our limited warranty for our products sold. In addition, we may provide other credits to certain customers pursuant to price protection and stock rotation rights, all of which are considered variable consideration when estimating the amount of revenue to recognize. We use the “most likely amount” method to determine the amount of consideration to which we are entitled. Our estimate of variable consideration is reassessed at the end of each reporting period based on changes in facts and circumstances. Historically, returns and credits have not been material.

Engineering Services - We enter into contracts for professional engineering services that include software development and customization. We identify each performance obligation in our engineering services agreements (“ESAs”) at contract inception. The ESA generally includes project deliverables specified by the customer. The performance obligations in the ESA are generally combined into one deliverable, with the pricing for services stated at a fixed amount. Services provided under the ESA generally result in the transfer of control over time. We recognize revenue on ESAs based on the proportion of labor hours expended to the total hours expected to complete the contract performance obligation. ESAs could include substantive customer acceptance provisions. In ESAs that include substantive customer acceptance provisions, we recognize revenue upon customer acceptance.

License Revenue - On occasion, we derive revenue from the license of our internally developed intellectual property (“IP”). IP licensing agreements that we enter into generally provide licensees the right to incorporate our IP components in their products with terms and conditions that vary by licensee. Fees under these agreements generally include license fees relating to our IP and support service fees, resulting in two performance obligations. We evaluate each performance obligation, which generally results in the transfer of control at a point in time for the license fee and over time for support services.

Other - From time-to-time, we enter into arrangements for other revenue generating activities, such as providing technical support services to customers through technical support agreements. In each circumstance, we evaluate such arrangements for our performance obligations which generally results in the transfer of control for such services over time. Historically, such arrangements have not been material to our operating results.

The following table provides information about disaggregated revenue based on the preceding categories for the years ended December 31, 2020 and 2019:

	Year ended December 31,	
	2020	2019
IC sales	\$ 39,205	\$ 66,250
Engineering services, license and other	1,650	2,505
Total revenues	<u>\$ 40,855</u>	<u>\$ 68,755</u>

For segment information, including revenue by geographic region, see "Note 13: Segment Information".

Our contract balances include accounts receivable, deferred revenue and our liability for warranty returns. For information concerning these contract balances, see "Note 3: Balance Sheet Components".

Payment terms and conditions for goods and services provided vary by contract; however, payment is generally required within 30 to 60 days of invoicing.

We have not identified any material costs incurred associated with obtaining a contract with a customer which would meet the criteria to be capitalized, therefore, these costs are expensed as incurred.

The aggregate amount of the transaction price allocated to unsatisfied performance obligations with an original expected duration of greater than one year is \$150, which we expect to recognize ratably over the next 15 months.

NOTE 8: INTEREST INCOME AND OTHER, NET

Interest income and other, consists of the following:

	Year Ended December 31,	
	2020	2019
Other income	\$ 161	\$ 425
Interest income	87	327
Interest expense	(239)	(158)
Total interest income and other, net	<u>\$ 9</u>	<u>\$ 594</u>

NOTE 9. INCOME TAXES

Current and Deferred Income Tax Expense

Domestic and foreign pre-tax income (loss) is as follows:

	Year Ended December 31,	
	2020	2019
Domestic	\$ (25,590)	\$ (16,072)
Foreign	(341)	7,448
Domestic and foreign pre-tax loss	<u>\$ (25,931)</u>	<u>\$ (8,624)</u>

Income tax expense attributable to operations is comprised of the following:

	Year Ended December 31,	
	2020	2019
Current:		
Federal	\$ (74)	\$ (103)
State	3	2
Foreign	643	509
Total current	<u>572</u>	<u>408</u>
Deferred:		
Foreign	26	45
Total deferred	<u>26</u>	<u>45</u>
Income tax expense	<u>\$ 598</u>	<u>\$ 453</u>

The reconciliation of the U.S. federal statutory income tax rate to our effective income tax rate is as follows:

	Year Ended December 31,	
	2020	2019
Federal statutory rate	21 %	21 %
Expiration of tax attributes	(14)	(38)
Impact of foreign earnings	(7)	(25)
Permanent items	(1)	3
Research and development credits	1	7
Stock-based compensation	(2)	(5)
Change in valuation allowance	—	31
Tax contingencies, net of reversals	—	1
Effective income tax rate	(2)%	(5)%

Deferred Tax Assets, Liabilities and Valuation Allowance

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and the amounts for income tax purposes. Significant components of our deferred tax assets and liabilities are as follows:

	December 31,	
	2020	2019
Deferred tax assets:		
Research and experimentation credit and deduction carryforwards	\$ 65,772	\$ 67,648
Net operating loss carryforwards	50,917	47,779
Depreciation and amortization	2,282	1,956
Deferred stock-based compensation	1,158	1,134
Foreign tax credit carryforwards	275	719
Reserves and accrued expenses	145	1,785
Other	2,074	1,434
Total gross deferred tax assets	122,623	122,455
Deferred tax liabilities:		
Other	(1,526)	(1,300)
Total gross deferred tax liabilities	(1,526)	(1,300)
Less valuation allowance	(120,981)	(121,005)
Net deferred tax assets	\$ 116	\$ 150

We continue to record a full valuation allowance against our U.S. and Canadian net deferred tax assets as of December 31, 2020 and 2019, as it is not more likely than not that we will realize a benefit from these assets in a future period. We have not provided a valuation allowance against any of our foreign net deferred tax assets as we have concluded it is more likely than not that we will realize a benefit from these assets in a future period because our subsidiaries in these jurisdictions are cost-plus taxpayers. The net valuation allowance decreased \$24 for the year ended December 31, 2020 and decreased \$2,667 for the year ended December 31, 2019.

As of December 31, 2020, we had federal, state and foreign net operating loss carryforwards of \$195,856, \$8,610 and \$34,309 respectively, which will begin to expire in 2021 with \$32,258 of our federal net operating loss carryforward lasting indefinitely. As of December 31, 2020, we had available federal, state and foreign research and experimentation tax credit carryforwards of \$8,631, \$4,761, and \$26,869 respectively. The federal and state tax credits will begin expiring in 2021 while the foreign credits have an indefinite life. In addition, our Canadian subsidiary has unclaimed scientific and experimental expenditures to be carried forward and applied against future income in Canada of approximately \$121,076. We have a general foreign tax credit of \$163 which will begin to expire in 2021.

Our ability to utilize our federal net operating losses may be limited by Section 382 of the Internal Revenue Code of 1986, as amended, which imposes an annual limit on the ability of a corporation that undergoes an "ownership change" to use its net operating loss carryforwards to reduce its tax liability. An ownership change is generally defined as a greater than 50% increase in equity ownership by 5% shareholders in any three-year period.

We are not indefinitely reinvested in the earnings of our subsidiaries and have accrued tax on the future repatriation of cash for jurisdictions where withholding taxes would apply.

Our Chinese subsidiary is designated as an Advanced Technology Service Enterprise, allowing it to benefit from a Chinese tax holiday resulting in a reduction of its tax rate to 15% through 2021. The tax rate will return to 25% in 2022 upon expiration of the tax holiday.

Uncertain Tax Positions

We have recorded tax liabilities to address potential exposures involving positions that could be challenged by taxing authorities. As of December 31, 2020, the amount of our uncertain tax positions was a liability of \$1,610 and a reduction to deferred tax assets of \$1,189. As of December 31, 2019, the amount of our uncertain tax positions was a liability of \$1,554 and a reduction to deferred tax assets of \$1,100.

The following is a summary of the change in our liability for uncertain tax positions and interest and penalties:

	2020	2019
Uncertain tax positions:		
Balance at beginning of year	\$ 2,569	\$ 2,504
Accrual for positions taken in a prior year	24	(14)
Accrual for positions taken in current year	192	188
Reversals due to lapse of statute of limitations	(74)	(109)
Balance at end of year	<u>\$ 2,711</u>	<u>\$ 2,569</u>
Interest and penalties:		
Balance at beginning of year	\$ 85	\$ 82
Accrual for positions taken in prior year	18	28
Accrual for positions taken in current year	—	2
Reversals due to lapse of statute of limitations	(15)	(27)
Balance at end of year	<u>\$ 88</u>	<u>\$ 85</u>

During the years ended December 31, 2020 and 2019 we recognized \$18 and \$30, respectively, of interest and penalties in income tax expense in our consolidated statements of operations.

We file income tax returns in the U.S. and various foreign jurisdictions. A number of years may elapse before an uncertain tax position is resolved by settlement or statute of limitations. Settlement of any particular position could require the use of cash. If the uncertain tax positions we have accrued for are sustained by the taxing authorities in our favor, the reduction of the liability will reduce our effective tax rate. We reasonably expect reductions in the liability for unrecognized tax benefits and interest and penalties of approximately \$13 within the next twelve months due to the expiration of statutes of limitation in federal, state and foreign jurisdictions.

We are no longer subject to U.S. federal, state, and foreign examinations for years before 2017, 2016 and 2013, respectively. Our net operating loss and tax credit carryforwards from all years may be subject to adjustment for three years following the year in which utilized. We do not anticipate that any potential tax adjustments will have a significant impact on our financial position or results of operations.

We were not subject to, nor have we received any notice of, income tax examinations in any jurisdiction as of December 31, 2020.

NOTE 10. COMMITMENTS AND CONTINGENCIES

Royalties

We license technology from third parties and have agreed to pay certain suppliers a royalty based on the number of chips sold or manufactured, the net sales price of the chips containing the licensed technology or a fixed non-cancelable fee. Royalty expense is recognized based on our estimated average unit cost for royalty contracts with non-cancelable prepayments and the stated contractual per unit rate for all other agreements. Royalty expense was \$242 and \$521 for the years ended December 31, 2020 and 2019, respectively, which is included in cost of revenue in our consolidated statements of operations.

401(k) Plan

We sponsor a 401(k) plan for eligible employees. Participants may defer a percentage of their annual compensation on a pre-tax basis, not to exceed the dollar limit that is set by law. A discretionary matching contribution by the Company is allowed and is equal to a uniform percentage of the amount of salary reduction elected to be deferred, which percentage will be determined each year by the Company. We made contributions of \$48 and \$62 to the 401(k) plan during the years ended December 31, 2020 and 2019, respectively.

Software licenses

We acquire rights to use certain software engineer design tools under software licenses.

As of December 31, 2020, future minimum payments under non-cancelable software licenses are as follows:

Year Ending December 31,	Software licenses
2021	\$ 829
2022	679
2023	99
	<u>1,607</u>
Less: Interest component	(107)
Present value of minimum software license payments	<u>1,500</u>
Less: Current portion	(786)
Long-term portion of obligations	<u>\$ 714</u>

Other Contractual Obligation

As part of the Acquisition, we acquired debt associated with an agreement with the Government of Canada called Technology Partnerships Canada ("TPC"). As part of the TPC agreement, ViXS Systems Inc. was provided funding to assist in research and development expenses of which a portion was later required to be repaid because the conditions for repayment were met. The scheduled payments are made on a quarterly basis and end in January 2024. \$499 and \$482 are included in accrued liabilities and current portion of long-term liabilities in our consolidated balance sheet as of December 31, 2020 and 2019, respectively. \$268 and \$441 are included in long-term liabilities, net of current portion in our consolidated balance sheets as of December 31, 2020 and 2019, respectively.

Contract Manufacturers

In the normal course of business, we commit to purchase products from our contract manufacturers to be delivered within the next 90 days. In certain situations, should we cancel an order, we could be required to pay cancellation fees. Such obligations could impact our immediate results of operations but would not materially affect our business.

Indemnifications

Certain of our agreements include limited indemnification provisions for claims from third-parties relating to our intellectual property. It is not possible for us to predict the maximum potential amount of future payments or indemnification costs under these or similar agreements due to the conditional nature of our obligations and the unique facts and circumstances involved in each particular agreement. We have not made any payments under these agreements in the past, and as of December 31, 2020, we have not incurred any material liabilities arising from these indemnification obligations. In the future, however, such obligations could immediately impact our results of operations but are not expected to materially affect our business.

Legal Proceedings

We are subject to legal matters that arise from time to time in the ordinary course of our business. Although we currently believe that resolving such matters, individually or in the aggregate, will not have a material adverse effect on our financial position, our results of operations, or our cash flows, these matters are subject to inherent uncertainties and our view of these matters may change in the future.

NOTE 11. EARNINGS PER SHARE

Basic earnings per share amounts are computed based on the weighted average number of common shares outstanding. Diluted weighted average shares outstanding include the weighted average number of common shares outstanding plus potentially dilutive common shares outstanding during the period.

The following schedule reconciles the computation of basic and diluted net loss per share (in thousands, except per share data):

	Year Ended December 31,	
	2020	2019
Net loss	\$ (26,529)	\$ (9,077)
Weighted average shares outstanding - basic and diluted	40,712	37,851
Net loss per share - basic and diluted	\$ (0.65)	\$ (0.24)

The following shares were excluded from the calculation of diluted net loss per share as their effect would have been anti-dilutive (in thousands):

	Year Ended December 31,	
	2020	2019
Employee equity incentive plans	4,148	3,419

Potentially dilutive common shares from employee equity incentive plans are determined by applying the treasury stock method to the assumed exercise of outstanding stock options, the assumed vesting of outstanding restricted stock units, and the assumed issuance of common stock under the employee stock purchase plan.

NOTE 12. SHAREHOLDERS' EQUITY

Preferred Stock

The Company is authorized to issue 50,000,000 shares of preferred stock with a par value of \$0.001 per share. The Board of Directors is authorized to fix or alter the rights, preferences, privileges and restrictions granted to, or imposed on, each series of preferred stock. There were no shares of preferred stock issued as of December 31, 2020 and 2019.

Common Stock

The Company is authorized to issue 250,000,000 shares of common stock with a par value of \$0.001 per share. Shareholders of common stock have unlimited voting rights and are entitled to receive the net assets of the Company upon dissolution, subject to the rights of the preferred shareholders, if any.

Equity Offering

On December 14, 2020, we completed the sale of 4,900,000 shares of common stock in an underwritten registered offering. On December 16, 2020, an additional 735,000 shares were issued pursuant to the 30-day over-allotment option exercised by the underwriter. With the over-allotment shares, a total of 5,635,000 shares of common stock were sold in the offering at a price to the public of \$2.45 per share. Net proceeds to the Company, after deducting underwriting discounts, commissions, and other expenses, were approximately \$12,743.

Private Placement Investment

On December 7, 2020, we completed a private placement of 724,288 shares of common stock to a certain accredited investor at a purchase price of \$2.071 per share. On December 15, 2020, we completed a private placement of 2,475,712 shares of common stock to a certain accredited investor at a purchase price of \$2.071. Net proceeds to the Company, after deducting commissions and other expenses, were approximately \$6,210.

At the Market Offering

On June 5, 2020, we entered into a sales agreement (the "Sales Agreement") with Cowen and Company, LLC ("Cowen"), pursuant to which we may issue and sell shares of the Company's common stock, par value \$0.001 per share, having an aggregate offering price of up to \$25,000, from time to time, through an "at the market" equity offering program under which Cowen will act as sales agent. Under the Sales Agreement, Cowen may sell the shares by methods deemed to be an "at the market offering" as defined in Rule 415(a)(4) promulgated under the Securities Act of 1933, as amended, including sales made by means of ordinary brokers' transactions on the Nasdaq Global Market or on any other existing trading market for the common stock or otherwise at market prices prevailing at the time of sale, in block transactions, or as otherwise directed by the Company. We pay Cowen a commission equal to three percent (3.0%) of the gross sales proceeds of any common stock sold through Cowen under the Sales Agreement. The Sales Agreement may be terminated by us upon prior notice to Cowen or by Cowen upon prior notice to us, or at any time under certain circumstances, including but not limited to the occurrence of a material adverse change in the Company. We are not obligated to sell any shares under the Sales Agreement.

During the year ended December 31, 2020, we sold an aggregate of 1,747,466 shares of our common stock under this at the market offering, resulting in aggregate net proceeds to us of approximately \$4,429.

Employee Equity Incentive Plans

On May 23, 2006, our shareholders approved the adoption of the Pixelworks, Inc. 2006 Stock Incentive Plan (the "2006 Plan"). The 2006 Plan has since been amended on certain occasions, most recently on May 15, 2020 when our shareholders approved an increase to the total number of authorized shares to 19,683,333 shares. As of December 31, 2020, 1,566,811 shares were available for grant under the 2006 Plan.

Stock Options

The contractual life of newly issued stock option awards is six years. Our new hire vesting schedule provides that each option becomes exercisable at a rate of 25% on the first anniversary date of the grant and 2.083% on the last day of every month thereafter for a total of 36 additional increments. Our merit vesting schedule provides that merit-type awards become exercisable monthly over a period of three years.

The following is a summary of stock option activity:

	Number of shares	Weighted average exercise price
Options outstanding as of December 31, 2019:	533,484	\$ 2.87
Granted	234,000	2.00
Exercised	(25,563)	2.74
Canceled and forfeited	(4,896)	3.98
Expired	(17,958)	5.16
Options outstanding as of December 31, 2020:	<u>719,067</u>	<u>\$ 2.53</u>

The following table summarizes information about options outstanding as of December 31, 2020:

Range of exercise prices	Options Outstanding			Options Exercisable	
	Number outstanding as of December 31, 2020	Weighted average remaining contractual life	Weighted average exercise price	Number exercisable as of December 31, 2020	Weighted average exercise price
\$2.00 - \$2.00	237,500	5.79	\$ 2.00	3,500	\$ 2.00
2.46 - 2.46	350,000	1.01	2.46	350,000	2.46
2.79- 6.05	131,567	2.59	3.67	105,150	3.54
\$2.00 - \$6.05	<u>719,067</u>	2.88	\$ 2.53	<u>458,650</u>	\$ 2.70

During the years ended December 31, 2020 and 2019 the total intrinsic value of options exercised was \$28 and \$256, respectively, for which no income tax benefit has been recorded because a full valuation allowance has been provided for our U.S. deferred tax assets. As of December 31, 2020, options outstanding had a total intrinsic value of \$323.

Options outstanding that have vested and are expected to vest as of December 31, 2020 are as follows:

	Number of shares	Weighted average exercise price	Weighted average remaining contractual term	Aggregate intrinsic value
Vested	458,650	\$ 2.70	1.30	\$ 131
Expected to vest	244,024	2.22	5.64	180
Total	<u>702,674</u>	<u>\$ 2.54</u>	<u>2.81</u>	<u>\$ 311</u>

Restricted Stock

The 2006 Plan provides for the issuance of restricted stock, including restricted stock units. During the years ended December 31, 2020 and 2019 we granted 2,137,317 and 1,917,514 shares, respectively, of restricted stock with a weighted average grant date fair value of \$3.42 and \$3.81 per share, respectively.

The following is a summary of restricted stock activity:

	Number of shares	Weighted average grant date fair value
Unvested at December 31, 2019:	3,112,426	\$ 4.06
Granted	2,137,817	3.42
Vested	(1,834,406)	3.93
Canceled	(239,232)	4.28
Unvested at December 31, 2020:	<u>3,176,605</u>	<u>\$ 3.68</u>
Expected to vest after December 31, 2020	2,947,031	\$ 3.68

Employee Stock Purchase Plans

On May 18, 2010, our shareholders approved the adoption of the 2010 Pixelworks, Inc. Employee Stock Purchase Plan (the "ESPP") for U.S. employees and for certain foreign subsidiary employees. The ESPP provides for separate offering periods commencing on February 1 and August 1, with the first offering period beginning August 1, 2010. Each offering period continues for a period of 18 months with purchases every six months. Each eligible employee may purchase up to 3,000 shares of stock on each purchase date, with a maximum annual purchase amount of \$25. The purchase price is equal to 85% of the lesser of the fair market value of the shares on the offering date or on the purchase date. On May 15, 2020 the ESPP was amended when our shareholders approved an increase to the total number of shares of common stock reserved for issuance to 3,300,000. During the years ended December 31, 2020 and 2019, we issued 202,019 and 194,361 shares, respectively for proceeds of \$529 and \$519, respectively, under the ESPP.

Stock-Based Compensation Expense

The fair value of stock-based compensation was determined using the Black-Scholes option pricing model and the following weighted average assumptions:

	Year Ended December 31,	
	2020	2019
Stock Option Plans:		
Risk free interest rate	2.00 %	2.47 %
Expected dividend yield	0 %	0 %
Expected term (in years)	3.75	5.00
Volatility	64 %	66 %
Employee Stock Purchase Plan:		
Risk free interest rate	0.79 %	2.05 %
Expected dividend yield	0 %	0 %
Expected term (in years)	1.05	1.05
Volatility	65 %	65 %

The weighted average fair value of options granted during the years ended December 31, 2020 and 2019 was \$0.93 and \$2.23, respectively. The risk free interest rate is estimated using an average of treasury bill interest rates. The expected dividend yield is zero as we have not paid any dividends to date and do not expect to pay dividends in the future. Expected volatility is estimated based on the historical volatility of our common stock over the expected term as this represents our best estimate of future volatility. The contractual life of newly issued stock options is six years, and we have elected to use the "simplified method" to estimate expected term. Under the simplified method, an option's expected term is calculated as the average of its vesting period and original contractual life. The expected term of ESPP purchase rights is based on the estimated weighted average time to purchase.

As of December 31, 2020, unrecognized stock-based compensation expense is \$5,391, which is expected to be recognized as stock-based compensation expense over a weighted average period of 1.09 years.

NOTE 13. SEGMENT INFORMATION

We have identified a single operating segment: the design and development of ICs for use in electronic display devices. Substantially all of our assets are located in the U.S.

Geographic Information

Revenue by geographic region, was as follows:

	Year Ended December 31,	
	2020	2019
Japan	\$ 26,554	\$ 53,628
China	8,935	10,213
U.S.	3,057	3,105
Taiwan	1,668	1,597
Europe	333	104
Korea	308	108
	<u>\$ 40,855</u>	<u>\$ 68,755</u>

Significant Customers

The percentage of revenue attributable to our distributors, top five end customers, and individual distributors or end customers that represented more than 10% of revenue in at least one of the periods presented, is as follows:

	Year Ended December 31,	
	2020	2019
Distributors:		
All distributors	49 %	44 %
Distributor A	23 %	28 %
End Customers: ¹		
Top five end customers	58 %	77 %
End customer A	40 %	49 %
End customer B	5 %	12 %

¹ End customers include customers who purchase directly from us, as well as customers who purchase our products indirectly through distributors.

Each of the following accounts represented 10% or more of total accounts receivable in at least one of the periods presented:

	December 31,	
	2020	2019
Account X	39 %	42 %
Account Y	20 %	26 %
Account Z	7 %	24 %

NOTE 14. QUARTERLY FINANCIAL DATA (UNAUDITED)

	Quarterly Period Ended			
	March 31	June 30	September 30	December 31
2020				
Revenue, net	\$ 13,774	\$ 9,253	\$ 8,190	\$ 9,638
Gross profit	6,775	5,049	3,976	4,385
Loss from operations	(5,277)	(6,421)	(8,137)	(6,901)
Loss before income taxes	(5,223)	(6,445)	(8,165)	(6,098)
Net loss	(5,399)	(6,552)	(8,139)	(6,439)
Net loss per share - basic and diluted	(0.14)	(0.17)	(0.20)	(0.15)
2019				
Revenue, net	\$ 16,648	\$ 18,027	\$ 18,057	\$ 16,023
Gross profit	8,472	9,376	9,347	7,300
Loss from operations	(3,460)	(2,321)	(2,444)	(4,898)
Income (loss) before income taxes	541	(2,217)	(2,374)	(4,574)
Net income (loss)	133	(2,448)	(2,306)	(4,456)
Net income (loss) per share:				
Basic	0.00	(0.06)	(0.06)	(0.12)
Diluted	0.00	(0.06)	(0.06)	(0.12)

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

None.

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

As of the end of the period covered by this report, we conducted an evaluation under the supervision and with the participation of our Chief Executive Officer (our Principal Executive Officer) and Chief Financial Officer (our Principal Accounting and Financial Officer) of our disclosure controls and procedures (as defined in Rule 13a-15(e) and Rule 15d-15(f) of the Securities Exchange Act of 1934, as amended (the "Exchange Act")). Based on this evaluation, the Chief Executive Officer and Chief Financial Officer concluded that, as of December 31, 2020, our disclosure controls and procedures were effective to ensure that information required to be disclosed in our periodic reports filed or submitted under the Securities Exchange Act is (i) recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and (ii) accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding disclosure.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining a system of internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles ("U.S. GAAP"). All internal control systems, no matter how well designed, have inherent limitations.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, under the oversight of our Board of Directors, we evaluated the effectiveness of our internal control over financial reporting as of December 31, 2020, the last day of our fiscal year. This evaluation was based on the criteria established in *Internal Control - Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our assessment, management has concluded that our internal control over financial reporting was effective as of the end of the fiscal year to provide reasonable assurances regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with U.S. GAAP.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting for external purposes in accordance with U.S. GAAP. A company's internal control over financial reporting includes those policies and procedures that:

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

Management's assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2020 has not been audited by the Company's independent registered public accounting firm. Management's report is not subject to attestation by the Company's independent registered public accounting firm pursuant to the rules of the Securities and Exchange Commission that permit the Company to provide only management's report in this Annual Report.

Changes in Internal Control Over Financial Reporting

There were no changes to our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during the fourth quarter of 2020 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Information required by Item 10 with respect to our directors and executive officers will be set forth under the captions "Proposal No. 1: Election of Directors - Director Nominees for Election" and "Information about our Executive Officers" in our Proxy Statement for our 2021 Annual Meeting of Shareholders (the "2021 Proxy Statement") to be filed within 120 days after December 31, 2020 and pursuant to Regulation 14A and is incorporated herein by reference.

Item 405 of Regulation S-K calls for disclosure of any known late filing or failure by an insider to file a report required by Section 16(a) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). To the extent disclosure for delinquent reports is being made, it can be found under the caption "Delinquent Section 16(a) Reports" in the 2021 Proxy Statement and is herein incorporated by reference.

We have adopted a Code of Business Conduct and Ethics that applies to all directors and employees, including our Chief Executive Officer (our Principal Executive Officer) and our Chief Financial Officer (our Principal Accounting and Financial Officer). We have also adopted a Code of Ethics for Senior or Designated Financial Personnel (the "Code of Ethics for Senior or Designated Financial Personnel") that applies to our Chief Executive Officer (our Principal Executive Officer), our Chief Financial Officer (our Principal Accounting and Financial Officer) and other designated financial personnel. The Code of Business Conduct and Ethics and the Code of Ethics for Senior or Designated Financial Personnel are each available on our website free of charge at www.pixelworks.com. We intend to disclose any changes in or waivers from our Code of Business Conduct and Ethics or Code of Ethics for Senior or Designated Financial Personnel by posting such information on our website at www.pixelworks.com or by filing a Current Report on Form 8-K.

We have a separately designated standing audit committee established in accordance with the Securities Exchange Act of 1934. The members of the audit committee are Daniel Heneghan, Chairman, C. Scott Gibson and Richard Sanquini. The audit committee has the responsibility and authority described in the Pixelworks, Inc. Charter of the Audit Committee of the Board of Directors, which has been approved by our board of directors. A copy of the audit committee charter is available on our website at www.pixelworks.com. Our board of directors has determined that Mr. Heneghan, Mr. Gibson and Mr. Sanquini meet the independence requirements set forth in Rule 10A-3(b)(1) under the Exchange Act and in the applicable rules of Nasdaq. In addition, our board of directors has determined that Mr. Heneghan, Mr. Gibson and Mr. Sanquini each qualify as an audit committee financial expert as defined by Securities and Exchange Commission rules.

Item 11. Executive Compensation.

Information required by Item 11 with respect to executive compensation will be included under the captions "Compensation Committee Report", "Executive Compensation" and "Information About Our Board of Directors - Director Compensation" in our 2021 Proxy Statement and is incorporated herein by reference.

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

Information required by Item 12 with respect to security ownership of certain beneficial owners and management and related stockholder matters will be included under the captions "Security Ownership of Certain Beneficial Owners and Management" and "Information about our Equity Compensation Plans" in our 2021 Proxy Statement and is incorporated herein by reference.

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

Information required by Item 13 with respect to certain relationships and related transactions and director independence will be included under the captions "Certain Relationships and Related Transactions" and "Information About Our Board of Directors" in our 2021 Proxy Statement and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

Information required by Item 14 with respect to principal accounting fees and services will be set forth under the caption "Information About Our Independent Registered Public Accounting Firm" in our 2021 Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) 1. Financial Statements.

The following financial statements are included in Item 8 Financial Statements and Supplementary Data:

[Reports of Independent Registered Public Accounting Firms](#)
[Consolidated Balance Sheets as of December 31, 2020 and 2019](#)
[Consolidated Statements of Operations for the years ended December 31, 2020 and 2019](#)
[Consolidated Statements of Comprehensive Loss for the years ended December 31, 2020 and 2019](#)
[Consolidated Statements of Cash Flows for the years ended December 31, 2020 and 2019](#)
[Consolidated Statements of Shareholders' Equity for the years ended December 31, 2020 and 2019](#)
[Notes to Consolidated Financial Statements](#)

(a) 2. Financial Statement Schedules.

All schedules have been omitted because the required information is included in the consolidated financial statements or the notes thereto, or is not applicable or required.

(a) 3. Exhibits.

The exhibits listed below are either filed with this report or incorporated by reference into this report.

Exhibit Number	Description
2.1	Arrangement Agreement between Pixelworks, Inc. and ViXS Systems Inc. dated May 18, 2017 (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed on May 23, 2017). (The "Arrangement Agreement").
2.2	Plan of Arrangement (Schedule A to the Arrangement Agreement), as approved by the Ontario Superior Court of Justice (Commercial List) (incorporated by reference to Exhibit 2.2 to the Company's Current Report on Form 8-K filed on August 8, 2017).
3.1	Sixth Amended and Restated Articles of Incorporation of Pixelworks, Inc., as Amended by First and Second Amendments thereto (incorporated by reference to Exhibit 3.1 to the Company's Quarterly Report on Form 10-Q filed on August 9, 2004).
3.2	Third Amendment to Sixth Amended and Restated Articles of Incorporation of Pixelworks, Inc. (incorporated by reference to Exhibit 3.1 to the Company's Quarterly Report on Form 10-Q filed on August 11, 2008).
3.3	Second Amended and Restated Bylaws of Pixelworks, Inc. (incorporated by reference to Exhibit 3.3 to the Company's Annual Report on Form 10-K filed March 10, 2010).
4.1	Description of securities registered pursuant to Section 12 of the Securities Exchange Act of 1934 (incorporated by reference to Exhibit 4.1 to the Company's Annual Report on Form 10-K filed on March 11, 2020).
10.1+	Form of Indemnity Agreement between Pixelworks, Inc. and each of the members of the Board and Steven Moore, the Company's Chief Financial Officer. (incorporated by reference to Exhibit 10.1 to the Company's Annual Report on Form 10-K filed on March 14, 2018).
10.2+	Pixelworks, Inc. 1997 Stock Incentive Plan, as amended (incorporated by reference to Exhibit 99.1 to the Company's Registration Statement on Form S-8 filed on June 21, 2005).

- 10.3+ [Pixelworks, Inc. Amended and Restated 2010 Employee Stock Purchase Plan \(incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed on May 12, 2011\).](#)
- 10.4+ [Pixelworks, Inc. Amended and Restated 2006 Stock Incentive Plan \(incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-8 filed on July 16, 2012\).](#)
- 10.5+ [Pixelworks, Inc. Amended and Restated 2006 Stock Incentive Plan, Terms and Conditions of Restricted Stock Awards \(incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed on May 7, 2009\).](#)
- 10.6+ [Pixelworks, Inc. Amended and Restated 2006 Stock Incentive Plan, Terms and Conditions of Option Grants \(incorporated by reference to Exhibit 10.9 to the Company's Annual Report on Form 10-K filed March 8, 2012\).](#)
- 10.7+ [Pixelworks, Inc. Amended and Restated 2006 Stock Incentive Plan, Terms and Conditions of Director Stock Unit Awards \(incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q filed on November 4, 2010\).](#)
- 10.8+ [Pixelworks, Inc. Amended and Restated 2006 Stock Incentive Plan, Terms and Conditions of Restricted Stock Unit Award. \(incorporated by reference to Exhibit 10.8 to the Company's Annual Report on Form 10-K filed on March 4, 2015\).](#)
- 10.9+ [Summary of Pixelworks 2020 Non-Employee Director Compensation \(incorporated by reference to Exhibit 10.9 to the Company's Annual Report on Form 10-K filed on March 11, 2020\).](#)
- 10.10+ [Summary of Pixelworks 2019 Non-Employee Director Compensation. \(incorporated by reference to Exhibit 10.9 to the Company's Annual Report on Form 10-K filed on March 13, 2019\).](#)
- 10.11+ [Summary of Pixelworks 2018 Non-Employee Director Compensation. \(incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed on May 10, 2018\).](#)
- 10.12+ [Form of Pixelworks, Inc. Senior Management Bonus Plan \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed December 31, 2009\).](#)
- 10.13+ [Offer Letter with Todd A. DeBonis dated December 9, 2015 \(incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed on February 2, 2016\).](#)
- 10.14+ [Change of Control Severance Agreement effective January 4, 2016, by and between Pixelworks, Inc. and Todd A. DeBonis \(incorporated by reference to Exhibit 10.18 to the Company's Annual Report on Form 10-K filed March 8, 2017\).](#)
- 10.15+ [Amended and Restated Change of Control and Severance Agreement by and between Pixelworks, Inc. and Todd A. Debonis, dated April 11, 2019 \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 15, 2019\).](#)
- 10.16+ [Executive Compensation Recovery Policy, adopted April 11, 2019 by the Pixelworks, Inc. Board of Directors \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 15, 2019\).](#)
- 10.17+ [Offer Letter with Elias Nader \(incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K filed with the SEC on September 16, 2019\).](#)
- 10.18+ [Change of Control and Severance Agreement with Elias Nader \(incorporated by reference to Exhibit 10.2 of the Registrant's Current Report on Form 8-K filed with the SEC on September 16, 2019\).](#)

- 10.19 [Office Lease Agreement dated December 2005, by and between CA-The Concourse Limited Partnership and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.42 to the Company's Annual Report on Form 10-K filed March 13, 2006\).](#)
- 10.2 [Office Lease Agreement dated September 10, 2008 and commencing December 1, 2008 by and between Pixelworks, Inc. and Durham Plaza, LLC \(incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed on November 7, 2008\).](#)
- 10.21 [First Amendment to Office Lease Agreement, dated April 16, 2013, by and between CA-The Concourse Limited Partnership and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.19 to the Company's Annual Report on Form 10-K filed on March 4, 2015\).](#)
- 10.22 [Second Amendment to Office Lease Agreement, dated July 25, 2018, by and between Hudson Concourse, LLC, and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed on November 9, 2018\).](#)
- 10.23 [First Amendment to Lease, dated July 1, 2013, by and between Durham Plaza, LLC and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.20 to the Company's Annual Report on Form 10-K filed on March 4, 2015\).](#)
- 10.24 [Second Amendment to Lease, dated May 18, 2016, by and between Kalberer Company and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.25 to the Company's Annual Report on Form 10-K filed on March 8, 2017\).](#)
- 10.25 [Third Amendment to Lease, dated January 30, 2019, by and between Kalberer Company and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed on May 10, 2019\).](#)
- 10.26 [Loan and Security Agreement dated December 21, 2010 by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.26 to the Company's Annual Report on Form 10-K filed March 9, 2011\).](#)
- 10.27 [Amendment No. 1 dated December 14, 2012 to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed December 20, 2012\).](#)
- 10.28 [Amendment No. 2 dated December 4, 2013 to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed December 9, 2013\).](#)
- 10.29 [Amendment No. 3 dated December 18, 2015 to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed December 22, 2015\).](#)
- 10.30 [Amendment No. 4 dated December 15, 2016 to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed December 19, 2016\).](#)
- 10.31 [Amendment No. 5 dated July 21, 2017, to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Quarterly Report on Form 10-Q filed August 14, 2017\).](#)
- 10.32 [Amendment No. 6 dated December 21, 2017, to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed December 22, 2017\).](#)

- 10.33 [Amendment No. 7 dated December 18, 2018, to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed December 20, 2018\).](#)
- 10.34 [Amendment No. 8 dated December 18, 2019, to the Loan and Security Agreement dated December 21, 2010, by and between Silicon Valley Bank and Pixelworks, Inc. \(incorporated by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K filed December 20, 2019\).](#)
- 10.35 [Amendment No. 9 to the Loan and Security Agreement, between Pixelworks, Inc. and Silicon Valley Bank, dated April 17, 2020 \(incorporated by reference to Exhibit 10.1 of the Company's Quarterly Report on Form 10-Q filed May 8, 2020\).](#)
- 10.36 [Amendment No. 10 to the Loan and Security Agreement, between Pixelworks, Inc. and Silicon Valley Bank, dated December 14, 2020](#)
- 10.37 [Promissory Note between the Company and Silicon Valley Bank dated April 25, 2020 \(incorporated by reference by Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 30, 2020\).](#)
- 10.38 [Sales Agreement, dated June 5, 2020, between Pixelworks, inc. and Cowen and Company, LLC \(incorporated by reference to Exhibit 1.1 to the Company's Current Report on Form 8-K filed on June 5, 2020\).](#)
- 10.39 [Amended and Restated Securities Purchase Agreement dated December 4, 2020, between the Company and the investors named therein.](#)
- 10.40 [Underwriting Agreement dated as of December 10, 2020 by and among the Company and Roth Capital Partners, LLC and Craig-Hallum Capital Group LLC, as representatives of the several Underwriters \(incorporated by reference to Exhibit 1.1 to the Company's Current Report on Form 8-K filed on December 10, 2020\).](#)
- 10.41+ [Form of Addendum to Change of Control Agreement for Officers \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on May 23, 2014\).](#)
- 21 [Subsidiaries of Pixelworks, Inc. \(incorporated by reference to Exhibit 21 to the Company's Annual Report on Form 10-K filed on March 14, 2018\).](#)
- 23.1 [Consent of Armanino LLP.](#)
- 23.2 [Consent of KPMG LLP.](#)
- 24.1 [Power of Attorney \(see page 85 of this Form 10-K\).](#)
- 31.1 [Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 \(18 U.S.C. Section 1350\).](#)
- 31.2 [Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 \(18 U.S.C. Section 1350\).](#)
- 32.1* [Certification of Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 \(18 U.S.C. Section 1350\).](#)
- 32.2* [Certification of Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 \(18 U.S.C. Section 1350\).](#)

101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)

+ Indicates a management contract or compensation arrangement.

* Exhibits 32.1 and 32.2 are being furnished and shall not be deemed to be "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liability of that section, nor shall such exhibits be deemed to be incorporated by reference in any registration statement or other document filed under the Securities Act of 1933, as amended, or the Exchange Act, except as otherwise stated in such filing.

(b) Exhibits.

See Item 15 (a) (3) above.

(c) Financial Statement Schedules.

See Item 15 (a) (2) above.

Item 16. Form 10-K Summary.

Not applicable.

**Tenth Amendment
to
Loan and security agreement**

This Tenth Amendment to Loan and Security Agreement (this “Amendment”) is entered into as of December 14, 2020, by and between **SILICON VALLEY BANK** (“Bank”) and **PIXELWORKS, INC.**, an Oregon corporation (“Borrower”).

Recitals

A. Bank and Borrower have entered into that certain Loan and Security Agreement dated as of December 21, 2010 (as the same may be amended, modified, supplemented and/or restated from time to time, including without limitation, by that certain Amendment No. 1 to Loan and Security Agreement dated as of December 14, 2012, that certain Amendment No. 2 Amendment to Loan and Security Agreement dated as of December 4, 2013, that certain Amendment No. 3 to Loan and Security Agreement dated as of December 18, 2015, that certain Amendment No. 4 to Loan and Security Agreement dated as of December 15, 2016, that certain Amendment No. 5 to Loan and Security Agreement dated as of July 21, 2017, that certain Amendment No. 6 to Loan and Security Agreement dated as of December 21, 2017, that certain Seventh Amendment to Loan and Security Agreement dated as of December 18, 2018, that certain Eighth Amendment to Loan and Security Agreement dated as of December 18, 2019, collectively, and that certain Ninth Amendment to Loan and Security Agreement dated as of April 17, 2020, the “Loan Agreement”). Capitalized terms used, but not defined herein, shall bear the meanings ascribed to such terms in the Loan Agreement.

B. Bank has extended credit to Borrower for the purposes permitted in the Loan Agreement.

C. Borrower has requested that Bank amend the Loan Agreement to extend the Revolving Line Maturity Date (as defined in the Loan Agreement), as more fully set forth herein.

D. Bank has agreed to so amend certain provisions of the Loan Agreement, but only to the extent, in accordance with the terms, subject to the conditions and in reliance upon the representations and warranties set forth below.

Agreement

Now, Therefore, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, and intending to be legally bound, the parties hereto agree as follows:

- 1. Definitions.** Capitalized terms used but not defined in this Amendment shall have the meanings given to them in the Loan Agreement.
- 2. Amendment to Loan Agreement.**

2.1 Section 13 (Definitions). The following term and its respective definition set forth in Section 13.1 of the Loan Agreement hereby is amended and restated in its entirety as follows:

“**Revolving Line Maturity Date**” is March 26, 2021.

3. Limitation of Amendment.

3.1 This Amendment is effective for the purposes set forth herein and shall be limited precisely as written and shall not be deemed to (a) be a consent to any amendment, waiver or modification of any

other term or condition of any Loan Document, or (b) otherwise prejudice any right or remedy which Bank may now have or may have in the future under or in connection with any Loan Document.

3.2 This Amendment shall be construed in connection with and as part of the Loan Documents and all terms, conditions, representations, warranties, covenants and agreements set forth in the Loan Documents, except as herein amended, are hereby ratified and confirmed and shall remain in full force and effect.

4. Representations and Warranties. To induce Bank to enter into this Amendment, Borrower hereby represents and warrants to Bank as follows:

4.1 Immediately after giving effect to this Amendment (a) the representations and warranties contained in the Loan Documents are true, accurate and complete in all material respects as of the date hereof (except to the extent such representations and warranties relate to an earlier date, in which case they are true and correct as of such date), and (b) no Event of Default has occurred and is continuing;

4.2 Borrower has the power and authority to execute and deliver this Amendment and to perform its obligations under the Loan Agreement, as amended by this Amendment;

4.3 The organizational documents of Borrower delivered to Bank on or prior to the Effective Date remain true, accurate and complete and have not been amended, supplemented or restated and are and continue to be in full force and effect;

4.4 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, have been duly authorized;

4.5 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not and will not contravene (a) any law or regulation binding on or affecting Borrower, (b) any contractual restriction with a Person binding on Borrower, (c) any order, judgment or decree of any court or other governmental or public body or authority, or subdivision thereof, binding on Borrower, or (d) the organizational documents of Borrower;

4.6 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not require any order, consent, approval, license, authorization or validation of, or filing, recording or registration with, or exemption by any governmental or public body or authority, or subdivision thereof, binding on Borrower, except as already has been obtained or made; and

4.7 This Amendment has been duly executed and delivered by Borrower and is the binding obligation of Borrower, enforceable against Borrower in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, liquidation, moratorium or other similar laws of general application and equitable principles relating to or affecting creditors' rights.

5. Integration. This Amendment and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Amendment and the Loan Documents merge into this Amendment and the Loan Documents.

6. Counterparts. This Amendment may be executed in any number of counterparts and all of such counterparts taken together shall be deemed to constitute one and the same instrument.

7. Effectiveness. This Amendment shall be deemed effective upon (a) the due execution and delivery to Bank of this Amendment by each party hereto, and (b) Borrower's payment of all Bank Expenses due and owing as of the date hereof, which may be debited from any of Borrower's accounts at Bank.

In Witness Whereof, the parties hereto have caused this Amendment to be duly executed and delivered as of the date first written above.

BANK

SILICON VALLEY BANK

By: /s/ Alexander Primak

Name: Alex Primak

Title: Vice President

BORROWER

PIXELWORKS, INC.

By: /s/ Elias Nader

Name: Elias Nader

Title: VP & CFO

AMENDED AND RESTATED SECURITIES PURCHASE AGREEMENT

THIS AMENDED AND RESTATED SECURITIES PURCHASE AGREEMENT (this “**Agreement**”) is dated as of December 4, 2020, by and between Pixelworks, Inc., an Oregon corporation (the “**Company**”), MTM-Xinhe Investment Limited, a British Virgin Islands company (the “**Original Investor**”) and CloudAlpha Master Fund (the “**New Investor**” and together with the Original Investor, collectively, the “**Investors**”).

BACKGROUND

A. The Company and the Original Investor entered into a Securities Purchase Agreement dated as of October 19, 2020 (the “**Prior Agreement**”), whereby the Original Investor agreed to purchase, and the Company agreed to sell, upon the terms and conditions stated in the Prior Agreement, an aggregate of 3,200,000 (appropriately adjusted to give effect to any Stock Event occurring after the date of this Agreement and on or prior to the applicable Closing Date) shares (collectively, the “**Shares**”) of common stock of the Company, par value \$0.001 per share (“**Common Stock**”).

B. The Company and the Original Investor desire to amend the Prior Agreement by entering into this Amended and Restated Securities Purchase Agreement to provide that the Shares will instead be purchased in part by the Original Investor, and in part by the New Investor.

C. The Company and the Investors are executing and delivering this Agreement in reliance upon the exemption from registration afforded by Section 4(a)(2) of the Securities Act of 1933, as amended (the “**Securities Act**”), and Rule 506 of Regulation D (“**Regulation D**”) as promulgated by the United States Securities and Exchange Commission (the “**SEC**”) under the Securities Act.

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration the receipt and adequacy of which are hereby acknowledged, the Company and the Investors agree as follows:

Article I

A. DEFINITIONS

1.1 Definitions

. In addition to the terms defined elsewhere in this Agreement, the following terms have the meanings indicated:

“**9.9% Cap**” has the meaning set forth in Section 4.12.

“**Affiliate**” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 144 under the Securities Act.

“**Agreement**” has the meaning set forth in the Preamble.

“**Announcing 8-K Filing**” has the meaning set forth in Section 4.7.

“**Attribution Parties**” means, with respect to each Investor, collectively, any of the Investor’s Affiliates, any Persons acting as a “group” together with the Investor with respect to the Common Stock for purposes of Section 13(d) of the Exchange Act, and any other Persons

whose beneficial ownership of the Common Stock would be aggregated with the Investor's for purposes of Section 13(d) of the Exchange Act.

"Applicable SEC Filings" has the meaning set forth in Section 3.1.

"Bloomberg" means Bloomberg Financial Markets or an equivalent, reliable reporting service mutually agreed upon by the Company and the Investors.

"Business Day" means any day other than Saturday, Sunday, or other day on which commercial banks in the City of San Francisco, California, U.S.A., are authorized or required by law to remain closed.

"Closing" means a closing of the purchase and sale of the Shares pursuant to Section 2.1.

"Closing Date" means the Initial Closing Date and/or the Second Closing Date, as applicable.

"Company Board" means the board of directors of the Company.

"Company Covered Person" means, with respect to the Company as an "issuer" for purposes of Rule 506 promulgated under the Securities Act, any Person listed in the first paragraph of Rule 506(d)(1).

"Common Stock" has the meaning set forth in the Preamble.

"Common Stock Equivalents" means any Options or Convertible Securities.

"Company" has the meaning set forth in the Preamble.

"Company Charter Documents" means the articles of incorporation and bylaws of the Company, each as amended to date.

"Company Stock Plan" means the Company's Amended and Restated 2006 Stock Incentive Plan, as amended and restated, and the Company's 2010 Employee Stock Purchase Plan, as amended and restated.

"Company Shareholders" means holders of shares of Common Stock in their respective capacities as such.

"Company Subsidiary" means any direct or indirect Subsidiary of the Company.

"Convertible Securities" means any debt, preferred stock or other securities or instruments (other than Options) at any time directly or indirectly convertible into or exchangeable for Common Stock or that otherwise entitle the holder thereof to receive, directly or indirectly, Common Stock or other securities that entitle the holder to receive, directly or indirectly, Common Stock.

"Disclosure Materials" has the meaning set forth in Section 3.1(g).

"Disclosure Schedules" has the meaning set forth in Section 3.1.

"Disqualification Event" has the meaning set forth in Section 3.1(aa).

"Exchange Act" means the Securities Exchange Act of 1934, as amended.

"FINRA" means the Financial Industry Regulatory Authority.

“Fundamental Representations” means the representations and warranties made by the Company in subsections (a), (b), (c), (d), (e), (f), (g), (h), (i), (j) (excluding clause (ii) of the first sentence thereof), (k), (l), (m), (n), (o), (p), (x), (y), (z) and (aa) of Section 3.1.

“GAAP” has the meaning set forth in Section 3.1(h).

“Governmental Entity” means any supranational, national, state, municipal, local or foreign government, any instrumentality, subdivision, court, administrative agency or commission or other governmental authority or instrumentality.

“Initial Closing” has the meaning set forth in Section 2.1(a).

“Initial Closing Date” has the meaning set forth in Section 2.1(a).

“Intellectual Property” means all (i) trademarks, service marks, trade dress, slogans, logos, trade names, corporate names, Internet domain names, and any other indicia of source, together with all goodwill associated with each of the foregoing, (ii) copyrights (whether or not registered or published) and works of authorship, (iii) registrations and applications for registration for any of the foregoing, (iv) patents (including all reissuances, divisionals, provisionals, continuations and continuations-in-part, re-examinations, renewals, substitutions and extensions thereof), patent applications, patent disclosures and inventions (whether or not patentable or reduced to practice), (v) computer software (including but not limited to source code and object code), data, databases, and documentation thereof, (vi) trade secrets and other confidential information, know-how, protocols, processes, methodologies, techniques, strategies, and processes, (vii) other intellectual property and all rights associated with any of the foregoing, including the right to prosecute and recover monetary damages for any past, present and future infringements and other violations thereof, and (viii) copies and tangible embodiments of the foregoing (in whatever form or medium).

“Investors” has the meaning set forth in the Preamble.

“knowledge of the Company,” “knowledge” or “the Company’s knowledge” means the actual knowledge of any of the executive officers (as defined in Rule 405 under the Securities Act) of the Company and the knowledge that any such executive officer would be expected to have after reasonable due diligence inquiry.

“Legal Requirements” means any federal, state, local, municipal, foreign or other law, statute, constitution, principle of common law, resolution, ordinance, code, order, edict, decree, rule, regulation, ruling or requirement issued, enacted, adopted, promulgated, implemented or otherwise put into effect by or under the authority of any Governmental Entity.

“Liabilities” means any liability, obligation or commitment of any kind (whether accrued, absolute, contingent, matured, unmatured or otherwise).

“Liens” means any material pledges, liens, charges, encumbrances and security interests of any kind or nature whatsoever.

“Lockup Period” has the meaning set forth in Section 4.2.

“Material Adverse Effect” means any result, occurrence, change, event, circumstance, fact or effect (each, an **“Effect”**) that, individually or in the aggregate with any such other Effects (regardless of whether or not such Effect constitutes a breach of the representations and warranties made by the Company in this Agreement), is, or is reasonably likely to be, materially

adverse to (i) the business, results of operations, condition (financial or otherwise), or assets of the Company and the Company Subsidiaries, taken as a whole, (ii) the legality or enforceability of any of this Agreement or (iii) the ability of the Company to perform its obligations under this Agreement; provided that in determining whether a Material Adverse Effect has occurred for purposes of clause (i) above, there shall be excluded any Effect on the Company and the Company Subsidiaries relating to or arising in connection with (i) changes in Legal Requirements or the adoption or amendment of financial accounting standards by the Financial Accounting Standards Board (provided that such conditions do not have a materially disproportionate impact on the Company and the Company Subsidiaries, taken as a whole, relative to other participants in their industry), (ii) the declaration by the United States of a national emergency or war, or the occurrence of any other calamity or crisis, in each case, arising after the date hereof (including any act of terrorism) (provided that such conditions do not have a materially disproportionate impact on the Company and the Company Subsidiaries, taken as a whole, relative to other participants in their industry), (iii) general business or economic conditions (provided that such conditions do not have a materially disproportionate impact on the Company and the Company Subsidiaries, taken as a whole, relative to other participants in their industry), (iv) conditions generally affecting the industry in which the Company and the Company Subsidiaries operate (provided that such conditions do not have a materially disproportionate impact on the Company and the Company Subsidiaries, taken as a whole, relative to other participants in their industry), (v) any failure by the Company to meet any internal projections or analyst estimates (but not the underlying reasons for the failure to meet any internal projections or analyst estimates), (vi) the COVID-19 pandemic (provided that such conditions do not have a materially disproportionate impact on the Company and the Company Subsidiaries, taken as a whole, relative to other participants in their industry), and (vii) any action taken by the Company at the written request of an Investor or that an Investor consents to in writing.

“**Options**” means any rights, warrants or options at any time directly or indirectly exercisable for, or otherwise representing a right to subscribe for or purchase, directly or indirectly, any Common Stock or Convertible Securities.

“**Order**” has the meaning set forth in Section 5.1(a).

“**Person**” means any individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company government (or an agency or subdivision thereof) or other entity of any kind.

“**Private Transfer**” has the meaning set forth in Section 4.1(a).

“**Purchase Price**” has the meaning set forth in Section 2.1.

“**Regulation D**” has the meaning set forth in the Preamble.

“**Registrable Securities**” means (i) the Shares and (ii) any shares of capital stock or other securities issued or issuable in exchange for or with respect to any of the Shares upon any stock split, dividend or other distribution, recapitalization, exchange, adjustment or similar event with respect to such Shares; provided, that any of the foregoing securities shall cease to be Registrable Securities upon the earliest to occur of the following: (A) such securities are sold pursuant to an effective registration statement; (B) such securities are sold pursuant to Rule 144; or (C) such securities are eligible for sale pursuant to Rule 144 without any volume or other limitation or restriction thereunder, other than a “current public information” requirement,

provided, in the case of this clause (C), that the Company shall have taken such actions (including delivery of any necessary legal opinions to the Transfer Agent) as shall be necessary, to effect the removal of any restrictive legend from such securities in accordance with [Section 4.1](#).

“**Repurchase Price**” means an aggregate price equal to (i) the aggregate Purchase Price paid by an Investor for the Shares being repurchased by the Company (appropriately adjusted to reflect any Stock Event occurring after the applicable Closing Date for such Investor), *plus* (ii) the Repurchase Price Interest.

“**Repurchase Price Interest**” means an amount equal to (i) the quotient of 5% of the aggregate Purchase Price paid by an Investor for the Shares being repurchased by the Company divided by 365, *multiplied* by (ii) the number of days that have elapsed since the applicable Closing Date for such Investor.

“**Rule 144**” means Rule 144 promulgated by the SEC pursuant to the Securities Act, as such Rules may be amended from time to time, or any similar rule or regulation adopted by the SEC having substantially the same effect as such Rule.

“**Sanctions**” has the meaning set forth in [Section 3.1\(w\)](#).

“**Sanctioned Country**” has the meaning set forth in [Section 3.1\(w\)](#).

“**Sarbanes-Oxley**” has the meaning set forth in [Section 3.1\(u\)](#).

“**SEC**” has the meaning set forth in the Preamble.

“**SEC Reports**” has the meaning set forth in [Section 3.1\(g\)](#).

“**Second Closing**” has the meaning set forth in Section 2.1(c).

“**Second Closing Date**” has the meaning set forth in Section 2.1(b).

“**Securities Act**” has the meaning set forth in the Preamble.

“**Shares**” has the meaning set forth in the Preamble.

“**Shelf Registration Statement**” has the meaning set forth in Section 4.5.

“**Short Sales**” has the meaning set forth in [Section 3.2\(k\)](#).

“**Standard Settlement Period**” means, as of any date, the standard settlement period for equity trades effected on securities exchanges in the United States, expressed in a number of Trading Days, as in effect on such date.

“**Stock Event**” means a stock split, stock combination, reclassification, payment of stock dividend, recapitalization or other similar transaction in respect of, or otherwise affecting, the Common Stock.

“**Subsidiary**” means with respect to any Person (i) a corporation of which fifty percent (50%) or more of the combined voting power of the outstanding voting stock of which is owned, directly or indirectly, by such Person or by one of more other Subsidiaries of such Person or by such Person and one or more other Subsidiaries thereof; (ii) a partnership of which such Person, or one or more other Subsidiaries of such Person or such Person and one or more other Subsidiaries thereof, directly or indirectly, is the general partner and has the power to direct the policies, management and affairs of such partnership; (iii) a limited liability company of which

such Person or one or more other Subsidiaries of such Person or such Person and one or more other Subsidiaries thereof, directly or indirectly, is the manager or managing member and has the power to direct the policies, management and affairs of such company; or (iv) any other Person in which such Person, or one or more other Subsidiaries of such Person or such Person and one or more other Subsidiaries thereof, directly or indirectly, has at least a majority ownership and power to direct the policies, management and affairs thereof.

“**Subsidiary Charter Documents**” means the certificate of incorporation and bylaws, or like organizational documents, of each of the Company Subsidiaries.

“**Taxes**” means all taxes, charges, fees, levies or other like assessments, including United States federal, state, local, foreign and other net income, gross income, gross receipts, social security, estimated, sales, use, ad valorem, franchise, profits, net worth, alternative or add-on minimum, capital gains, license, withholding, payroll, employment, unemployment, social security, excise, property, transfer taxes and any and all other taxes, assessments, fees or other governmental charges, whether computed on a separate, consolidated, unitary, combined or any other basis together with any interest and any penalties, additions to tax, estimated taxes or additional amounts with respect thereto, and including any liability for taxes as a result of being a member of a consolidated, combined, unitary or affiliated group or any other obligation to indemnify or otherwise succeed to the tax liability of any other Person.

“**Tax Returns**” means all returns, declarations, reports, statements, schedules, notices, forms or other documents or information required to be filed in respect of the determination, assessment, collection or payment of any Tax or in connection with the administration, implementation or enforcement of any Legal Requirement relating to any Tax.

“**Trading Day**” means any day on which the Common Stock is traded for any period on the Nasdaq Global Market or, if the Nasdaq Global Market is not the principal trading market for the Common Stock, on the principal Trading Market or other securities exchange or market on which the Common Stock is then being traded; provided, however, that during any period in which the Common Stock is not listed or quoted on the Nasdaq Global Market or any other securities exchange or market, the term “Trading Day” shall mean a Business Day.

“**Transfer Agent**” means Broadridge Corporate Issuer Solutions or any successor transfer agent for the Company.

“**Trading Market**” means any of the following national securities exchanges: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market or the New York Stock Exchange (or any successors to any of the foregoing).

Article II

PURCHASE AND SALE

2.1 Closings.

(a) Subject to the satisfaction or waiver of the conditions to the obligations of the parties hereto in Article V, the initial Closing (the “**Initial Closing**”) shall take place on December 7, 2020 (or such other date as mutually agreed between the Company and the New Investor)(the “**Initial Closing Date**”) at 9:00 a.m. Pacific Time at the offices of the Company’s counsel in Palo Alto, California. Subject to the terms and conditions set forth in this Agreement,

at the Initial Closing, the Company shall issue and sell to the New Investor, and the New Investor shall purchase from the Company, 724,288 of the Shares at a per share price of \$2.071 (appropriately adjusted to give effect to any Stock Event occurring after the date of this Agreement and on or prior to the Initial Closing Date) (the “**Purchase Price**”).

(b) On each Business Day beginning on the date hereof and through and including December 14, 2020 (or such date as mutually agreed between the Company and the Original Investor)(the “**Second Closing Date**”), the Original Investor shall deliver, or cause to be delivered, to the Company an amount equal to at least \$500,000 in United States dollars and in immediately available funds, by wire transfer to the Company to an account designated in writing to the Original Investor, for the Company to hold in escrow for the potential sale of a portion of the Shares hereunder; provided, however that on December 14, 2020, the minimum amount required to be transferred shall instead equal \$127,199.56. The Company shall hold such cash separately and shall not use such funds unless and until a Second Closing occurs. In the event a Second Closing does not occur, the Company shall promptly return to the Original Investor, any cash received by it to date pursuant to this Section 2.1(b) (the “**Investment Funds**”).

(c) Subject to the satisfaction or waiver of the conditions to the obligations of the parties hereto in Article V, a second Closing shall take place on the Second Closing Date only if the Company has received Investment Funds of at least \$5,127,199.56 (the “**Maximum Investment**”) from the Original Investor prior to such date. If the Company has received the Maximum Investment by the Second Closing Date, then subject to the terms and conditions set forth in this Agreement, the Company shall issue and sell to the Original Investor and the Original Investor shall purchase from the Company, 2,475,712 of the Shares at the Purchase Price. Subject to the satisfaction or waiver of the conditions to the obligations of the parties hereto in Article V, if, on the Second Closing Date, the Company has received Investment Funds from the Original Investor in an amount less than the Maximum Investment, the Company shall have the option, in its sole discretion to (i) issue and sell to the Original Investor that number of Shares equal to (x) the Investment Funds received prior to such date, divided by (y) the Purchase Price, or (ii) return the Investment Funds in full, and the Original Investor shall not be entitled to purchase any Shares, any rights provided to the Investors hereunder (other than the right to receive the Investment Funds) shall immediately terminate as to the Original Investor, and the Original Investor shall cease to be an Investor hereunder. If a Closing occurs on the Second Closing Date pursuant to the terms of this Section 2.1(c), such Closing (the “**Second Closing**”) shall take place at 2:00 p.m. Pacific Time at the offices of the Company’s counsel in Palo Alto, California.

2.2 Closing Deliveries.

(a) At a Closing, the Company shall issue to the applicable Investor a certificate or certificates (as directed by the Investor), issued in the name of the Investor (or its designee(s)) and duly executed on behalf of the Company, evidencing the Shares the Investor is purchasing, which shares shall be subject to the restrictions and legend set forth in Section 4.1(b) hereto.

(b) At the Initial Closing, the New Investor shall deliver or cause to be delivered to the Company the amount of the aggregate Purchase Price for the Shares being purchased by the New Investor of \$1,500,000.45 in United States dollars and in immediately available funds, by

wire transfer to an account designated in writing to the Investor by the Company at least three Business Days prior to the Initial Closing Date.

Article III

REPRESENTATIONS AND WARRANTIES OF THE COMPANY

3.1 Except (a) other than for purposes of the Fundamental Representations, as specifically disclosed in the SEC Reports filed by the Company with the SEC pursuant to the Exchange Act after December 31, 2019 and at least five (5) Business Days prior to the date hereof (the “**Applicable SEC Filings**”) (excluding any disclosures set forth under the heading “Risk Factors” or disclosure of risks set forth in any “forward-looking statements” disclaimer, or disclosures in any other statements that are similarly cautionary or predictive in nature), or (b) as set forth in the Disclosure Schedules delivered by the Company to the Investors concurrently herewith (the “**Disclosure Schedules**”), which Disclosure Schedules shall be deemed a part hereof and shall qualify any representation made herein to the extent of the disclosure contained in the corresponding section of the Disclosure Schedules and any other representation to the extent that the applicability of any such disclosure contained in the Disclosure Schedules is reasonably apparent on its face (notwithstanding the absence of a specific cross reference), the Company hereby represents and warrants as of the date hereof and the Closing Date (except for the representations and warranties that speak as of a specific date, which shall be made as of such date), to each of the Investors:

(a) Subsidiaries. The Company has no significant Subsidiaries other than those included in the Applicable SEC Filings and the Company does not own or have any right or obligation (by law, contract or otherwise) to make any investment or otherwise acquire, directly or indirectly, any outstanding capital stock of, or other equity interest in, any Person. The Company owns, directly or indirectly, all of the capital stock or comparable equity interests of each Company Subsidiary free and clear of any Lien, and all the issued and outstanding shares of capital stock or comparable equity interest of each Company Subsidiary are duly authorized, validly issued and are fully paid, non-assessable and free of preemptive rights.

(b) Organization and Qualification. Each of the Company and the Company Subsidiaries is an entity duly organized, validly existing and in good standing under the laws of the jurisdiction of its incorporation or organization (except, in the case of good standing, for entities organized under the laws of any jurisdiction that does not recognize such concept), with the requisite corporate power and authority to own and use its properties and assets and to carry on its business as currently conducted. Neither the Company nor any Company Subsidiary is in violation of any of the provisions of its Company Charter Documents or Subsidiary Charter Documents, as the case may be. The Company and the Company Subsidiaries are duly qualified to do business and are in good standing (except for entities organized under the laws of any jurisdiction that does not recognize such a concept) as a foreign corporation or other entity in each jurisdiction in which the nature of the business conducted or property owned by it makes such qualification necessary, except where the failure to be so qualified or in good standing, as the case may be, would not have or reasonably be expected to result in a Material Adverse Effect. The Company has furnished to the Investors, through the SEC’s Electronic Data Gathering Analysis and Retrieval System (EDGAR), true and correct copies of the Company’s Charter Documents as in effect on the date this representation is made, and all documents and

instruments containing the terms of all securities convertible into, or exercisable or exchangeable for, Common Stock, and the material rights of the holders thereof in respect thereto.

(c) Authorization; Enforcement. The Company has the requisite corporate power and authority to enter into and to consummate the transactions contemplated by this Agreement and otherwise to carry out its obligations hereunder, including the issuance to the Investors of the Shares. The execution and delivery of this Agreement by the Company and the consummation by it of the transactions contemplated hereby have been duly authorized by all necessary corporate action on the part of the Company, and no further consent or action is required by the Company, the Company Board or the Company Shareholders. This Agreement has been (or upon delivery will be) duly executed by the Company and is, or when delivered in accordance with the terms hereof, will constitute, the valid and binding obligation of the Company enforceable against the Company in accordance with its terms, except as may be limited by (A) applicable bankruptcy, insolvency, reorganization or other laws of general application relating to or affecting the enforcement of creditors rights generally, and (B) the effect of rules of law governing the availability of specific performance and other equitable remedies.

(d) No Conflicts. The execution, delivery and performance of this Agreement by the Company and the consummation by the Company of the transactions contemplated hereby, including the issuance to the Investors of the Shares, do not, and will not, (i) conflict with or violate any provision of the Company Charter Documents or Subsidiary Charter Documents, (ii) conflict with, or constitute a default (or an event that with notice or lapse of time or both would result in a default) under, result in the creation of any Lien upon any of the properties or assets of the Company or any Company Subsidiary or give to others any rights of termination, amendment, acceleration or cancellation (with or without notice, lapse of time or both) of, any contract, agreement or instrument to which the Company or any of the Company Subsidiaries is a party or by which it or any of its properties is bound or (iii) assuming that all consents, filings, approvals, authorizations and other actions as described herein have been obtained or made, result in a violation of any Legal Requirement or Order to which the Company or a Company Subsidiary is subject (including, assuming the accuracy of the representations and warranties of the Investors set forth in Section 3.2 hereof, federal and state securities laws), except in the case of clauses (ii) and (iii) such as would not, individually or in the aggregate, have or reasonably be expected to result in a Material Adverse Effect.

(e) Required Filings and Consents. No consent, approval, Order or authorization of, or registration, declaration or filing with any Governmental Entity is required to be obtained or made by the Company in connection with the execution and delivery of this Agreement or the performance by the Company of this Agreement or the transactions contemplated hereby, except for such consents, approvals, Orders, authorizations, registrations, declarations and filings as may be required under applicable federal, foreign and state securities (or related) laws, or the rules and regulations of any self-regulatory organization to which the Company or its securities are subject, as and to the extent expressly contemplated herein.

(f) Capitalization. There are 42,179,942 outstanding shares of Common Stock and no other outstanding shares of capital stock of the Company as of November 30, 2020. The Company has not issued any capital stock since November 30, 2020, other than to reflect issuances pursuant to the Company Stock Plan that do not, individually or in the aggregate, have a material effect on the issued and outstanding capital stock, options and other securities. No Person has any right of first refusal, preemptive right, right of participation, or any similar right

to participate in the transactions contemplated by this Agreement, including the issuance to the Investors of the Shares, that has not been effectively waived as of the Closing Date. Except as set forth in the Applicable SEC Filings, as a result of issuances pursuant to the Company Stock Plan, as set forth in the Disclosure Schedules or as a result of the purchase and sale of the Shares, there are no outstanding options, warrants, scrip rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities, rights or obligations convertible into or exercisable or exchangeable for, or giving any Person any right to subscribe for or acquire any shares of Common Stock, or contracts, commitments, understandings or arrangements by which the Company or any Company Subsidiary is or may become bound to issue additional shares of Common Stock or Common Stock Equivalents. The issuance and sale of the Shares will not obligate the Company to issue shares of Common Stock or other securities to any Person (other than the Investors) and will not result in a right of any holder of Company securities to adjust the exercise, conversion, exchange or reset price under any of such securities. All of the outstanding shares of capital stock of the Company are validly issued, fully paid and nonassessable, have been issued in compliance in all material respects with all applicable federal and state securities laws, and none of such outstanding shares was issued in violation of any preemptive rights or similar rights to subscribe for or purchase securities. No further approval or authorization of any shareholder, the Board of Directors or others is required for the issuance and sale of the Shares. There are no shareholder agreements, voting agreements or other similar agreements with respect to the Company's capital stock to which the Company is a party or, to the Company's knowledge, between or among any of the Company's shareholders. There are no agreements or arrangements under which the Company is obligated to register the sale of any of its securities under the Securities Act.

(g) **SEC Reports.** Since January 1, 2017, the Company has timely filed all registration statements, reports, schedules, forms, statements and other documents required to be filed by it under the Securities Act and the Exchange Act. Such registration statements, reports, schedules, forms, statements and other documents required to be filed by the Company under the Securities Act and the Exchange Act, together with any materials filed or furnished by the Company, whether or not any such documents were required, being collectively referred to herein as the "**SEC Reports.**" As of their respective filing dates, the SEC Reports filed by the Company complied in all material respects with the requirements of the Securities Act, the Exchange Act and the rules and regulations of the SEC promulgated thereunder, and none of the SEC Reports, when filed by the Company, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading, in each case except to the extent corrected by an SEC Report filed subsequently but prior to the date hereof.

(h) **Financial Statements.** The financial statements of the Company included in the SEC Reports comply, in all material respects with applicable accounting requirements and the rules and regulations of the SEC with respect thereto as in effect at the time of filing. Such financial statements have been prepared in accordance with United States generally accepted accounting principles applied on a consistent basis during the periods involved ("**GAAP**"), except as may be otherwise specified in such financial statements, the notes thereto and except that unaudited financial statements may not contain all footnotes required by GAAP or may be condensed or summary statements, and fairly present in all material respects the consolidated financial position of the Company and its consolidated Subsidiaries as of and for the dates

thereof and the results of operations and cash flows for the periods then ended, subject, in the case of unaudited statements, to normal, immaterial, year-end audit adjustments.

(i) No Changes; Undisclosed Liabilities. Since the date of the latest audited financial statements included within the Applicable SEC Filings, (i) except as specifically disclosed in a subsequent Applicable SEC Filing, there has been no event, occurrence or development that has had or that would reasonably be expected to result in a Material Adverse Effect, (ii) except as specifically disclosed in a subsequent Applicable SEC Filing, the Company has not incurred any material Liabilities other than (A) trade payables and accrued expenses incurred in the ordinary course of business consistent with past practice and (B) liabilities not required to be reflected in the Company's consolidated financial statements pursuant to GAAP or required to be disclosed in filings made with the SEC, (iii) the Company has not altered materially its method of accounting or changed its auditors, except as disclosed in the Applicable SEC Filings, (iv) the Company has not declared or made any dividend or distribution of cash or other property to its shareholders or purchased, redeemed or made any agreements to purchase or redeem any Common Stock, preferred stock or any other shares of capital stock, voting securities or other ownership interest, if any, of the Company (other than in connection with repurchases of unvested stock issued to employees of the Company), (v) the Company has not issued any equity securities to any officer, director or Affiliate of the Company or any Company Subsidiary except Common Stock issued pursuant to Company Stock Plans or executive and director compensation arrangements disclosed in the Applicable SEC Filings, (vi) none of the Company Charter Documents has been amended or otherwise modified, and (vii) there has been no Stock Event.

(j) Absence of Litigation. There is no action, suit, claim, or proceeding, inquiry or investigation, before or by any Governmental Entity pending or, to the knowledge of the Company, threatened against or affecting the Company or any of the Company Subsidiaries which, individually or in the aggregate, would reasonably be expected to (i) materially and adversely affect the legality, validity or enforceability of this Agreement or the consummation of the transactions contemplated hereby, or (ii) have a Material Adverse Effect.

(k) Accounting Matters. Since the date of the latest audited financial statements included within the Applicable SEC Filings, neither the Company nor any of the Company Subsidiaries nor, to the Company's knowledge, any director, officer or employee, of the Company or any of the Company Subsidiaries, has received or otherwise obtained any material complaint, allegation, assertion or claim, whether written or oral, regarding the accounting or auditing practices, procedures, methodologies or methods of the Company or any of the Company Subsidiaries or its internal accounting controls, including any material complaint, allegation, assertion or claim that the Company or any of the Company Subsidiaries has engaged in questionable accounting or auditing practices. Since the date of the latest audited financial statements included within the Applicable SEC Filings, no attorney representing the Company or any of the Company Subsidiaries, whether or not employed by the Company or any of the Company Subsidiaries, has reported evidence of a material violation of securities laws, breach of fiduciary duty or similar violation by the Company or any of the Company Subsidiaries or any of their respective officers, directors, employees or agents to the Company Board or any committee thereof or to any director or officer of the Company pursuant to Section 307 of Sarbanes-Oxley, and the SEC's rules and regulations promulgated thereunder. Since the date of the latest audited financial statements included within the Applicable SEC Filings, there have been no SEC

investigations or material internal investigations by the Company Board or any committee thereof regarding accounting or revenue recognition.

(l) No General Solicitation. Neither the Company, nor any of its Affiliates, nor any Person acting on its or their behalf, has engaged in any form of general solicitation or general advertising (within the meaning of Regulation D) in connection with the offer or sale of the Shares.

(m) No Integration. Neither the Company nor any of its Affiliates nor any Person acting on the Company's behalf has, directly or indirectly, at any time within the past six months, made any offer or sale of any security or solicitation of any offer to buy any security under circumstances that would (i) eliminate the availability of the exemption from registration under Regulation D under the Securities Act in connection with the offer and sale by the Company of the Shares as contemplated hereby or (ii) cause the offering of the Shares pursuant to this Agreement to be integrated with prior offerings by the Company for purposes of the Securities Act or any applicable stockholder approval provisions. Neither the Company nor any of its Affiliates nor any Person acting on the Company's behalf has offered or sold or will offer or sell any securities, or has taken or will take any other action, which would reasonably be expected to subject the offer, issuance or sale of the Shares, as contemplated hereby, to the registration provisions of the Securities Act.

(n) Investment Company Status. The Company is not, and after giving effect to the issuance and sale of the Shares, would not be required to be registered as an "investment company" within the meaning of the Investment Company Act of 1940, as amended.

(o) Private Placement. Assuming the accuracy of the representations and warranties of the Investors contained in Section 3.2 and the compliance by the Investors with the provisions set forth herein, the issuance and sale of the Shares in the manner contemplated by this Agreement is exempt from the registration requirements of the Securities Act and any applicable state securities laws.

(p) Listing and Maintenance Requirements. The Common Stock is listed on the Nasdaq Global Market. The Company has not, in the twelve (12) months preceding the date hereof, received written notice from the Nasdaq Global Market to the effect that the Company is not in compliance with the listing or maintenance requirements of such trading market. The Company is in compliance, in all material respects, with the listing and maintenance requirements of The Nasdaq Global Market. The issuance and sale of the Shares by the Company as contemplated in this Agreement does not contravene, or require shareholder approval pursuant to, the rules and regulations of the Nasdaq Global Market. The Common Stock is registered pursuant to Section 12(b) of the Exchange Act, and the Company has taken no action designed to, or which to its knowledge is likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act nor has the Company, in the twelve (12) months preceding the date hereof, received any notification that the SEC is contemplating terminating such registration. The Common Stock is eligible for clearing through The Depository Trust Company (the "DTC"), through its Deposit/Withdrawal At Custodian (DWAC) system, and the Company is eligible and participating in the Direct Registration System (DRS) of DTC with respect to the Common Stock. The Transfer Agent is a participant in DTC's Fast Automated Securities Transfer Program. The Common Stock is not, and has not been at any time, subject to any DTC "chill," "freeze" or similar restriction with respect to any DTC

services, including the clearing of shares of Common Stock through DTC. The Company is not, and never has been, a “shell company” (as defined in Rule 12b-2 under the Exchange Act) and is not an issuer of a type identified in, or subject to, Rule 144(i)(1) under the Securities Act. The SEC has never issued any stop order or other order suspending the effectiveness of any registration statement filed by the Company under the Securities Act.

(q) Taxes. Each of the Company and the Company Subsidiaries (i) has timely filed all foreign, federal and state income, franchise and all other material Tax Returns required by any jurisdiction to which it is subject, (ii) has timely paid all Taxes shown as being due and payable on its Tax Returns, and all other Taxes (if any) that are material in amount and required to be paid, except those for which the Company has made reserves in the consolidated financial statements of the Company and the Company Subsidiaries included in the Applicable SEC Filings that are adequate in accordance with GAAP, and (iii) has established in the consolidated financial statements of the Company and the Company Subsidiaries included in the Applicable SEC Filings reserves that are adequate in accordance with GAAP for the payment of all material Tax liabilities and deferred Taxes as of the date this representation is made. Neither the Company nor any of the Company Subsidiaries is or has been a U.S. real property holding corporation (as defined in Treasury Regulation Section 1.897-2(b) under the Code during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code. Since January 1, 2017, no deficiency for any income, franchise or other material amount of Tax relating to the Company or any of the Company Subsidiaries has been asserted or assessed by any taxing authority in writing. None of the Company or any of the Company Subsidiaries has entered into a "listed transaction" that has given rise to a disclosure obligation under Section 6011 of the Code and the Treasury Regulations promulgated thereunder.

(r) Intellectual Property Rights. To the Company’s knowledge, each of the Company and the Company Subsidiaries owns, or has the right to use pursuant to a valid and enforceable written license or has from the public domain, free and clear of any Liens, Intellectual Property sufficient for the conduct of its business as currently conducted. All owned Intellectual Property that is registered with or issued by a Governmental Entity is currently in the name of the Company or one of the Company Subsidiaries and, to the Company’s knowledge, any such registrations that have issued are valid and enforceable. Other than *ex parte* examinations in the course of patent prosecution, there is no pending or, to the Company’s knowledge, threatened action, suit, other proceeding or claim by any Person challenging or contesting (i) the validity, ownership or enforceability of any Intellectual Property owned by the Company or any of the Company Subsidiaries, (ii) the use of any Intellectual Property by the Company or the Company Subsidiaries, or (iii) any other rights of the Company or the Company Subsidiaries in or to any such Intellectual Property, and none of the Company or any of the Company Subsidiaries has received any written notice regarding any such action, suit, other proceeding or claim. To the Company’s knowledge, the conduct of the business of the Company has not, and none of the Company or any of the Company Subsidiaries has, infringed, misappropriated or otherwise violated, or is infringing, misappropriating or otherwise violating, any Intellectual Property of any Person. There is no pending or, to the Company’s knowledge, threatened action, suit, other proceeding or claim by any Person alleging that the Company or any of the Company Subsidiaries has infringed, misappropriated or otherwise violated, or is infringing, misappropriating or violating, or otherwise using without authorization, any Intellectual Property of any Person that is, or would reasonably be expected to be, material to the Company and its subsidiaries, taken as a whole, and none of the Company or any of the Company Subsidiaries has

received any written notice regarding, any such action, suit, other proceeding or claim that is, or would reasonably be expected to be, material to the Company and its subsidiaries, taken as a whole.

(s) Permits. The Company and the Company Subsidiaries possess all certificates, authorizations, approvals, licenses and permits issued by the appropriate U.S. federal or state or foreign regulatory authorities (including Governmental Entities) necessary to conduct their business as presently conducted, except where the failure to so possess would not reasonably be expected to result in a Material Adverse Effect, and none of the Company or any of the Company Subsidiaries has received any notice of proceedings relating to the revocation or modification of any such Permit.

(t) Compliance with Laws. Neither the Company nor any of the Company Subsidiaries is (i) in default under or in violation of (and no event has occurred that has not been waived that, with notice or lapse of time or both, would result in a default by the Company or any of the Company Subsidiaries under), nor has the Company or any of the Company Subsidiaries received written notice of a claim that it is in default under or that it is in violation of, any indenture, loan or credit agreement or any other contract, agreement or instrument to which it is a party or by which it or any of its properties is bound (whether or not such default or violation has been waived), (ii) in violation of any judgment, decree or order of any court, arbitrator or Governmental Entity, or (iii) in violation of any statute, rule, ordinance or regulation of any Governmental Entity or other regulatory authority, including any foreign, federal, state and local laws relating to taxes, environmental protection, occupational health and safety, product quality and safety, employee benefit or employment and labor matters, nor has the Company or any of the Company Subsidiaries received any notice, warning letter or other communication from any Governmental Entity or other regulatory authority that alleges any violation of any laws, rules or regulations by the Company or any of the Company Subsidiaries, except in each case of (i), (ii) and (iii), as would not have or reasonably be expected to result in a Material Adverse Effect.

(u) Sarbanes-Oxley. The Company is in all material respects in compliance with applicable provisions of the Sarbanes-Oxley Act of 2002, as amended, and the rules and regulations thereunder ("**Sarbanes-Oxley**").

(v) FCPA. Neither the Company nor any of the Company Subsidiaries, nor to the Company's knowledge, any director, officer, agent, employee or other Person acting on behalf of the Company or any of the Company Subsidiaries has, in the course of its actions for, or on behalf of, the Company or any of the Company Subsidiaries, used any corporate funds for any unlawful contribution, gift, entertainment or other unlawful expenses relating to political activity; made any direct or indirect unlawful payment to any foreign or domestic government official or employee from corporate funds; violated or is in violation of any provision of the U.S. Foreign Corrupt Practices Act of 1977, as amended; or made any unlawful bribe, rebate, payoff, influence payment, kickback or other unlawful payment to any foreign or domestic government official or employee.

(w) Sanctions. The Company and each Subsidiary is in compliance in all material respects with all U.S. economic sanctions laws, all executive orders and implementing regulations ("**Sanctions**") as administered by the U.S. Treasury Department's Office of Foreign Assets Control and the U.S. State Department. None of the Company or any of the Company

Subsidiaries (A) is a Person on the list of the Specially Designated Nationals and Blocked Persons (the "**SDN List**"), (B) is a person who is otherwise the target of U.S. economic sanctions laws such that a U.S. person cannot deal or otherwise engage in business transactions with such person, (C) is a Person organized or resident in a country or territory subject to comprehensive Sanctions (a "**Sanctioned Country**"), or (D) is owned or controlled by (including by virtue of such Person being a director or owning voting shares or interests), or acts, directly or indirectly, for or on behalf of, any Person on the SDN List or a government of a Sanctioned Country such that the entry into, or performance under, this Agreement would be prohibited by applicable U.S. law. The Company and each Subsidiary is in compliance in all material respects with all laws related to terrorism or money laundering including: (A) all applicable requirements of the Currency and Foreign Transactions Reporting Act of 1970 (31 U.S.C. 5311 et. seq. (the Bank Secrecy Act)), as amended by Title III of the Patriot Act, (B) the Trading with the Enemy Act, (C) that certain Executive Order No. 13224 of September 23, 2001, entitled Blocking Property and Prohibiting Transactions With Persons Who Commit, Threaten to Commit, or Support Terrorism (66 Fed. Reg. 49079 (2001)) or any other enabling legislation, executive order or regulations issued pursuant or relating thereto, and (D) other applicable federal or state laws relating to "know your customer" or anti-money laundering rules and regulations. No action, suit or other proceeding by or before any court or Governmental Authority with respect to compliance with such anti-money laundering laws is pending or, to the Company's knowledge, threatened.

(x) No Manipulation of Prices. None of the Company or the Company Subsidiaries, or, to the Company's knowledge, any of their respective officers, directors or Affiliates and, to the Company's knowledge, no one acting on any such Person's behalf has, (A) taken, directly or indirectly, any action designed to cause or to result in the stabilization or manipulation of the price of any securities of the Company or any Company Subsidiary to facilitate the sale or resale of the Shares, (B) sold, bid for, purchased, or paid any compensation for soliciting purchases of, any of the Shares, or (C) paid or agreed to pay to any Person any compensation for soliciting another to purchase any other securities of the Company or any Company Subsidiary in connection with the sale of the Shares.

(y) Application of Takeover Protections. There is no control share acquisition, business combination or other similar anti-takeover provision under the Company Charter Documents or applicable law that is or could become applicable to the Investors as a result of the transactions contemplated by this Agreement, including the Company's issuance of the Shares and the Investors' ownership of the Shares. The Company has not adopted a shareholders rights plan (or "poison pill") or similar arrangement relating to accumulations of beneficial ownership of Common Stock or a change in control of the Company.

(z) Brokers or Finders. There is no investment banker, broker, finder or other intermediary that has been retained by, or is authorized to act on behalf of, the Company or any of its Affiliates, or any of their respective officers or directors in their capacity as officers or directors, who might be entitled to any banking, broker's, finder's or similar fee or commission in connection with the transactions contemplated by this Agreement.

(aa) No Bad Actors. No "bad actor" disqualifying event described in Rule 506(d)(1)(i)-(viii) of the Securities Act (a "**Disqualification Event**") is applicable to the Company or, to the Company's knowledge, any Company Covered Person, except for a Disqualification Event as to which Rule 506(d)(2)(ii-iv) or (d)(3) is applicable.

3.2 Representations, Warranties and Covenants of the Investor

s. Each Investor hereby represents, warrants and covenants to the Company as of the date hereof and as of the applicable Closing Date (except for the representations and warranties that speak as of a specific date, which shall be made as of such date) as follows:

(a) Organization; Authority. The Investor is an entity duly organized, validly existing and in good standing under the laws of the jurisdiction of its organization with the requisite corporate, partnership, limited liability or other power and authority to enter into and to consummate the transactions contemplated by this Agreement and otherwise to carry out its obligations hereunder. The purchase by the Investor of Shares hereunder has been duly authorized by all necessary corporate, partnership, limited liability or other action on its part. This Agreement has been duly executed and delivered by the Investor and constitutes the valid and binding obligation of the Investor, enforceable against it in accordance with its terms, except as may be limited by (i) applicable bankruptcy, insolvency, reorganization or other laws of general application relating to or affecting the enforcement of creditors rights generally, and (ii) the effect of rules of law governing the availability of specific performance and other equitable remedies.

(b) No Public Sale or Distribution. The Investor is acquiring the Shares for its own account and not with a view towards, or for resale in connection with, the public sale or distribution thereof, except pursuant to sales registered under the Securities Act or under an exemption from such registration, and the Investor does not have a present arrangement to effect any distribution of the Shares to or through any other Person; provided, however, that by making the representations herein, the Investor does not agree to hold any of the Shares for any minimum or other specific term and reserves the right to assign, transfer or otherwise dispose of the Shares at any time in accordance with or pursuant to a registration statement or an exemption under the Securities Act, subject during the Lockup Period to the restrictions set forth in Section 4.3.

(c) Investor Status. At the time the Investor was first offered the Shares, it was, and at the date hereof it is an “accredited Investor” as defined in Rule 501(a) under the Securities Act. The Investor is not a registered broker dealer registered under Section 15(a) of the Exchange Act, or a member of FINRA or an entity engaged in the business of being a broker dealer. Except as otherwise disclosed in writing to the Company on or prior to the date of this Agreement, the Investor is not affiliated with any broker dealer registered under Section 15(a) of the Exchange Act, or a member of FINRA or an entity engaged in the business of being a broker dealer.

(d) Experience of the Investor. The Investor, either alone or together with its representatives, has such knowledge, sophistication and experience in business and financial matters so as to be capable of evaluating the merits and risks of the prospective investment in the Shares and has so evaluated the merits and risks of such investment. The Investor understands that it must bear the economic risk of this investment in the Shares indefinitely and is able to bear such risk and is able to afford a complete loss of such investment.

(e) Access to Information. The Investor acknowledges that copies of the Applicable SEC Filings are available on the SEC’s EDGAR system. The Investor acknowledges that it has had an opportunity to review the Applicable SEC Filings, this Agreement and the schedules, exhibits and attachments hereto (collectively, the “**Disclosure Materials**”) and has been afforded (i) the opportunity to ask such questions as it has deemed necessary of, and to receive answers

from, representatives of the Company concerning the terms and conditions of the offering of the Shares and the merits and risks of investing in the Shares, and (ii) access to information about the Company and the Company Subsidiaries and their respective financial condition, results of operations, business, properties, management and prospects as requested by or on behalf of the Investor. Neither such review or inquiries nor any other investigation conducted by or on behalf of the Investor or its representatives or counsel shall modify, amend or affect the Investor's right to rely on the truth, accuracy and completeness of the Disclosure Materials and the Company's representations, warranties, covenants and agreements contained in this Agreement.

(f) No Governmental Review. The Investor understands that no United States federal or state agency or any other government or governmental agency has passed on or made any recommendation or endorsement of the Shares or the fairness or suitability of the investment in the Shares nor have such authorities passed upon or endorsed the merits of the offering of the Shares.

(g) No Conflicts. The execution, delivery and performance by the Investor of this Agreement and the consummation by the Investor of the transactions contemplated hereby will not (i) result in a violation of the organizational documents of the Investor or (ii) conflict with, or constitute a default (or an event which with notice or lapse of time or both would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any contract to which the Investor is a party, or (iii) result in a violation of any Legal Requirements (including federal and state securities laws) applicable to the Investor, except in the case of clauses (ii) and (iii) above, for such violations that do not otherwise affect the ability of the Investor to consummate the transactions contemplated hereby.

(h) Restricted Securities. The Investor understands that the Shares are characterized as "restricted securities" under the U.S. federal securities laws inasmuch as they are being acquired from the Company in a transaction not involving a public offering.

(i) Availability of Funds. On the applicable Closing Date, the Investor will have immediately available funds in cash that will be sufficient to fulfill its obligations under Article II.

(j) Brokers or Finders. There is no investment banker, broker, finder or other intermediary that has been retained by, or is authorized to act on behalf of, the Investor or any of its Affiliates, or any of their respective officers or directors in their capacity as officers or directors, who might be entitled to any banking, broker's, finder's or similar fee or commission in connection with the transactions contemplated by this Agreement.

(k) Prohibited Transactions. Prior to giving effect to the Investor's purchase of the Shares pursuant to this Agreement, the Investor does not own, directly or indirectly, and no Person acting on behalf of or pursuant to any understanding with the Investor owns, any securities, including any derivatives, of the Company. The Investor covenants that neither it nor any Person acting on its behalf or pursuant to any understanding with the Investor has engaged prior to the date hereof, or prior to the Closing Date will engage, directly or indirectly, in any Short Sales involving Common Stock. "**Short Sales**" include all "short sales" as defined in Rule 200 promulgated under Regulation SHO under the Exchange Act and all types of direct and indirect stock pledges, forward sale contracts, options, puts, calls, short sales, swaps, derivatives and similar arrangements (including on a total return basis), and sales and other transactions through non-U.S. broker-dealers or foreign regulated brokers.

(l) Foreign Investor. If the Investor is not a United States person (as defined by Section 7701(a)(30) of the U.S. Internal Revenue Code of 1986, as amended), the Investor hereby represents that it has satisfied itself as to the full observance of the laws of its jurisdiction of residence in connection with the purchase of the Shares and this Agreement, including (a) any foreign exchange restrictions applicable to such purchase in such jurisdiction, (b) any governmental or other consents that may be required in such jurisdiction, and (c) any tax consequences in such jurisdiction that may be relevant to the purchase, holding, redemption, sale or transfer of the Shares. The Investor's subscription and payment for and continued beneficial ownership of the Shares will not violate any applicable securities or other laws of the Investor's jurisdiction of residence.

(m) General Solicitation. The Investor is not purchasing the Shares as a result of any advertisement, article, notice or other communication regarding the Shares published in any newspaper, magazine or similar media or broadcast over television or radio or presented at any seminar or any other general advertisement.

(n) Beneficial Ownership. Assuming the accuracy of the representations and warranties made by the Company in Section 3.1(f), the purchase by the Investor of the Shares issuable to it at the Closing will not result in the Investor (individually or together with any other Person with whom the Investor has identified, or will have identified, itself as part of a "group" in a public filing made with the SEC involving the Company's securities) acquiring, or obtaining the right to acquire, in excess of the 9.9% Cap on a post transaction basis that assumes that the Closing shall have occurred. The Investor does not presently intend to, alone or together with others, make a public filing with the SEC to disclose that it has (or that it together with such other Persons have) acquired, or obtained the right to acquire, as a result of the Closing (when added to any other securities of the Company that it or they then own or have the right to acquire), in excess of the 9.9% Cap on a post transaction basis that assumes that the Closing shall have occurred.

(o) No Intent to Effect a Change of Control. The Investor has no present intent to effect a "change of control" of the Company as such term is understood under the rules promulgated pursuant to Section 13(d) of the 1934 Act.

(p) No Rule 506 Disqualifying Activities. The Investor is not subject to the disqualification provisions of Rule 506(d)(1) of the Securities Act.

(q) Residency. The Investor's office in which its investment decision with respect to the Shares was made is located at the address immediately below the Investor's name on its signature page hereto.

Article IV

ADDITIONAL AGREEMENTS

4.1 Transfer Restrictions.

(a) Each Investor covenants that the Shares will only be disposed of pursuant to an effective registration statement under, and in compliance with the requirements of, the Securities Act or pursuant to an available exemption from the registration requirements of the Securities Act. In connection with any transfer of any Shares represented by certificates bearing the restrictive legend set forth in Section 4.1(b), other than (i) pursuant to an effective registration statement, (ii) to the Company, (iii) pursuant to Rule 144 (*provided* that the Investor provides the

Company with reasonable assurances (in the form of customary seller and, if applicable, broker representation letters) that the securities may be sold pursuant to such rule) or (iv) in connection with a bona fide pledge as contemplated in Section 4.1(b) (any such transfer other than those in (i)-(iv), a “**Private Transfer**”), the Company may require the transferor thereof to provide to the Company an opinion of counsel selected by the transferor and reasonably acceptable to the Company, the form and substance of which opinion shall be reasonably satisfactory to the Company, to the effect that such transfer does not require registration of such transferred Shares under the Securities Act. As a condition of any Private Transfer, and subject to the provisions of Section 7.7, any such transferee shall agree in writing to be bound by the applicable terms of this Article IV and shall have the rights and obligations of an Investor under this Article IV with respect to such transferred Shares.

(b) Each Investor agrees that the following legend shall be imprinted on any certificate evidencing any of the Shares until such time as such legend is not required under Section 4.1(c):

THESE SECURITIES HAVE NOT BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE IN RELIANCE UPON AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE “SECURITIES ACT”), OR ANY APPLICABLE STATE SECURITIES LAWS AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD (I) EXCEPT PURSUANT TO (A) AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT, (b) Rule 144 under the Securities Act OR (c) ANOTHER AVAILABLE EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT. NOTWITHSTANDING THE FOREGOING, THE SECURITIES MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN OR FINANCING ARRANGEMENT SECURED BY THE SECURITIES; PROVIDED THAT UPON FORECLOSURE OR TRANSFER OF THE SECURITIES, SUCH FORECLOSING PERSON OR TRANSFEREE SHALL COMPLY WITH APPLICABLE PROVISIONS OF THE SECURITIES PURCHASE AGREEMENT PURSUANT TO WHICH THESE SECURITIES WERE ORIGINALLY ISSUED.

The Company acknowledges and agrees that each Investor may from time to time pledge, and/or grant a security interest in, some or all of the legended Shares in connection with applicable securities laws, pursuant to a bona fide margin agreement in compliance with a bona fide margin loan. Such a pledge would not be subject to approval or consent of the Company and no legal opinion of legal counsel to the pledgee, secured party or pledgor shall be required in connection with the pledge, but such legal opinion shall be required in connection with a subsequent transfer or foreclosure following default by the transferee of the pledge. No notice shall be required of such pledge, but an Investor shall promptly notify the Company of any such subsequent transfer or foreclosure. Each Investor acknowledges that the Company shall not be responsible for any pledges relating to, or the grant of any security interest in, any of the Shares or for any agreement, understanding or arrangement between such Investor and its pledgee or secured party. Each Investor acknowledges and agrees that, except as otherwise provided in Section 4.1(c), any Shares subject to a pledge or security interest as contemplated by this Section

4.1(b) shall continue to bear the legend set forth in this Section 4.1(b) and be subject to the restrictions on transfer set forth in Section 4.1(a).

(c) The legend set forth above shall be removed from the certificates representing any Shares (and such Shares shall not be subject to any stop-transfer instructions) if (i) such Shares are registered for resale under the Securities Act (*provided* that, if an Investor is selling pursuant to the effective registration statement registering the Shares for resale, each Investor agrees to only sell such Shares during such time that such registration statement is effective and not withdrawn or suspended, and only as permitted by such registration statement), (ii) in connection with a sale, assignment or other transfer, such holder provides the Company with an opinion of counsel, the form of substance of which opinion shall be reasonably acceptable to the Company, that the sale, assignment or transfer of such Shares may be made without registration under the applicable requirements of the Securities Act, (iii) such Shares have been or are being sold pursuant to Rule 144 (as set forth in customary paperwork to such effect), or (iv) such holder provides the Company with reasonable assurance that the Shares can be sold, assigned or transferred pursuant to Rule 144 of the Securities Act without volume or manner-of-sale restrictions (which shall be satisfied if the applicable Investor certifies at such time that (a) it is not an “affiliate” of the Company (as such term is used under Rule 144), (b) that the Investor’s holding period for purposes of Rule 144 with respect to such Shares is at least six (6) months, and (c) Investor will comply with the requirements of Rule 144 in conducting any sale pursuant thereto). Each Investor specifically agrees that the Company’s legal counsel may rely on the certifications provided in (a)-(c) hereof in rendering its instruction letter to the transfer agent regarding removal of the restrictive legend. The Company agrees that, following such time as any of the foregoing conditions is met, it will, no later than the earlier of (x) two (2) Trading Days and (y) the number of Trading Days comprising the Standard Settlement Period following the delivery by an Investor to the Company or the Transfer Agent of a certificate representing Shares issued with a restrictive legend, deliver or cause the Transfer Agent to deliver to such Investor a certificate representing such Shares or, at the request of an Investor, deliver or cause to be delivered the Shares to such Investor by crediting the account of the Investor’s prime broker with DTC through its Deposit/Withdrawal at Custodian (DWAC) system, in each case, free from all restrictive and other legends and stop transfer instructions (or similar notations). Each Investor shall have the right to pursue any remedies available to it hereunder, or otherwise at law or in equity, including a decree of specific performance and/or injunctive relief, with respect to the Company’s failure to timely deliver shares of Common Stock without legend as required pursuant to the terms hereof.

4.2 Lockup Period. Until the earlier of (i) the termination of this Agreement pursuant to Section 7.1 hereto, and (ii) the date that is six months following the Initial Closing Date (the “**Lockup Period**”), each Investor shall not and shall cause its Affiliates not to, directly or indirectly, without the Company’s prior written consent:

(b) offer, pledge, sell, contract to sell, grant or enter into any option or contract to sell or otherwise dispose of, directly or indirectly, any of the Shares or any securities convertible into, exercisable for or exchangeable for any of the Shares; or

(c) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the Shares, whether any such

transaction described in clause (1) or (2) above is to be settled by delivery of Common Stock or such other securities, in cash or otherwise;

provided that, (A) if an Investor is a corporation, limited liability company, partnership, trust or other entity, this Section 4.2 shall not apply to transfers to its stockholders, members, partners or trust beneficiaries as part of a distribution or to any corporation, partnership or other entity that is its Affiliate so long as the Investor notifies the Company thereof and the transferee agrees to be bound in writing by the terms of this Section 4.2 prior to such transfer, and (B) this Section 4.2 shall not apply to transfers pursuant to a bona fide third-party tender offer, merger, consolidation or other similar transaction approved by the Company Board made to all holders of the Common Stock. For the avoidance of doubt, this Section 4.2 shall not apply to any shares of Common Stock or other securities acquired by an Investor after the Closing Date, on the open market or otherwise.

4.3 Furnishing of Information. From the date of this Agreement until the date that is eighteen (18) months after the Initial Closing Date, the Company shall (a) timely file (without giving effect to any grace period provided by Rule 12b-25 (or any successor thereto) under the Exchange Act) all reports required to be filed by the Company after the date hereof pursuant to the Exchange Act, and the Company shall not terminate the registration of the Common Stock under the Exchange Act or otherwise terminate its status as an issuer required to file reports under the Exchange Act, even if the securities laws would otherwise permit any such termination, (b) take all action reasonably necessary to continue at all times the listing and trading of the Common Stock on the Nasdaq Global Market (or another Trading Market) and comply in all respects with the Company's reporting, filing and other obligations under the bylaws or rules of the Nasdaq Global Market (or such other Trading Market), and (c) maintain the eligibility of the Common Stock for electronic transfer through the DTC. Each of the reports hereafter filed by the Company pursuant to the Exchange Act shall comply in all material respects with the applicable requirements of the Exchange Act and shall not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading.

4.4 Registration Rights. The Company hereby agrees that, if, on or at any time after the date that is six months after the Initial Closing Date and through and until the date that is one (1) year following the Initial Closing Date, any of the Shares constitute Registrable Securities, then as promptly as reasonably practicable thereafter the Company shall file with the SEC a "shelf" registration statement (a "**Shelf Registration Statement**") on Form S-3 (or successor thereto or, if the Company is not able to file on such form, on Form S-1 or successor thereto) covering the resale by the Investors (or other holder or holders of the Shares) of all of the Registrable Securities pursuant to a "plan of distribution" approved by the Investors, shall use its reasonable efforts to cause such Shelf Registration Statement to be declared effective as promptly as reasonably practicable after such filing and to thereafter remain effective until there are no longer any Registrable Securities, and shall take all such other actions as shall be reasonably necessary to facilitate the resale of the Registrable Securities by the Investors (or other holder or holders of the Shares) pursuant to such Shelf Registration Statement. In any such case, in connection with the filing of a Shelf Registration Statement, the Company and each Investor, each acting in good faith, shall use their reasonably best efforts to enter into a

registration rights agreement containing customary provision, including customary procedural requirements and customary indemnification and contribution provisions.

4.5 Integration. The Company shall not, and shall use its commercially reasonable efforts to ensure that no Affiliate thereof shall, sell, offer for sale or solicit offers to buy or otherwise negotiate in respect of any security (as defined in Section 2 of the Securities Act) that would be integrated with the offer or sale of the Shares in a manner that would require the registration under the Securities Act of the offer or sale of the Shares to the Investors or that would be integrated with the offer or sale of the Shares for purposes of the rules and regulations of the Nasdaq Global Market (or successor Trading Market where the Common Stock is traded).

4.6 Form D; Blue Sky Filings. The Company agrees to timely file a Form D with respect to the Shares as required under Regulation D and to provide a copy thereof, promptly upon request of the Investors. The Company shall take such action as the Company shall reasonably determine is necessary in order to obtain an exemption for, or to qualify, the sale of the Shares to the Investors at the Closing under applicable securities or "Blue Sky" laws of the states of the United States, and shall provide evidence of such actions promptly upon request of the Investors.

4.7 Public Disclosure. Without limiting any other provision of this Agreement, the Investors and the Company will consult with each other before issuing, and provide each other the reasonable opportunity to review and comment upon, and agree on, any press release with respect to this Agreement and the transactions contemplated hereby and will not issue any such press release prior to such review, except as may be required by law or any listing agreement with or rule of any applicable national or regional securities exchange or market. Within four (4) Business Days of the date of this Agreement, the Company shall file with the SEC a Current Report on Form 8-K describing all the material terms of the transactions contemplated by this Agreement, attaching this Agreement (without any redaction therefrom) and disclosing any other presently material non-public information (if any) provided or made available to the Investors (or the Investors' agents or representatives) on or prior to the date hereof (the "**Announcing 8-K Filing**"). On or before the fourth (4th) Business Day following the Closing Date or the termination of this Agreement, the Company shall file with the SEC a Current Report on Form 8-K disclosing the Closing or such termination, as applicable. The Company represents and warrants that, from and after the filing of the Announcing 8-K Filing, it shall have publicly disclosed all material, non-public information (if any) provided or made available to the Investors (or the Investors' agents or representatives) by the Company or any of its officers, directors, employees, Affiliates or agents in connection with the transactions contemplated by this Agreement or otherwise on or prior to the date hereof. The Company shall not, and shall cause each of its officers, directors, employees and agents, not to, provide the Investors with any such material, nonpublic information regarding the Company from and after the filing of the Announcing 8-K Filing without the express prior written consent of the Investors. The Company understands, acknowledges and agrees that (a) each Investor, its Affiliates and Persons acting on its behalf will rely on the provisions of this Section 4.7 in effecting transactions in the Shares and other securities of the Company and of other Persons, and (b) notwithstanding anything to the contrary contained herein, neither Investor nor the Investors' Affiliates, attorneys, agents or representatives shall have any duty of trust or confidence with respect to, or any obligation not to trade in any securities while aware of, any material non-public information (i) provided by, or on behalf of, the Company, any of its Affiliates or any of its officers, directors (or equivalent

persons), employees, attorneys, agents or representatives in violation of any of the representations, covenants, provisions or agreements set forth in this Section 4.7 or (ii) otherwise possessed (or continued to be possessed) by the Investors (or any Affiliate, agent or representative thereof) as a result of any breach or violation of any representation, covenant, provision or agreement set forth in this Section 4.7.

4.8 Commercially Reasonable Efforts. Upon the terms and subject to the conditions set forth in this Agreement, the Investors and the Company shall use commercially reasonable efforts to take, or cause to be taken, all actions, and to do, or cause to be done, and to assist and cooperate with the other party or parties hereto in doing, all things reasonably necessary, proper or advisable under applicable Legal Requirements to consummate and make effective, in the most expeditious manner practicable, the transactions contemplated by this Agreement, including using commercially reasonable efforts to: (i) cause the conditions to the issuance of the Shares pursuant to this Agreement set forth in Article V to be satisfied; (ii) obtain all necessary actions or non-actions, waivers, consents, approvals, orders and authorizations from Governmental Entities and make all necessary registrations, declarations and filings with Governmental Entities; and (iii) execute or deliver any additional instruments reasonably necessary to consummate the transactions contemplated by, and to fully carry out the purposes of, this Agreement, including the issuance of the Shares. The Company and the Investors shall cooperate with one another (x) in determining whether any action by or in respect of, or filing with, any Governmental Entity is required, or any actions, consents, approvals or waivers are required to be obtained from parties to any material contracts, in connection with the consummation of the transactions contemplated by this Agreement and (y) in taking such reasonable actions or making any such filings, furnishing information required in connection therewith and seeking timely to obtain any such actions, consents, approvals or waivers.

4.9 Use of Proceeds. The Company shall use the net proceeds from the sale of the Shares for general working capital purposes.

4.10 Prohibition on Variable Priced Securities. From the date of this Agreement until the first (1st) anniversary of the Initial Closing Date, the Company shall not in any manner issue or sell any securities that are convertible into or exchangeable or exercisable for shares of Common Stock at a price that varies or may vary with the market price of the Common Stock, including by way of one or more resets to a fixed price or increases in the number of shares of Common Stock issued or issuable, or at a price that upon the passage of time or the occurrence of certain events automatically is reduced or is adjusted or at the option of any Person may be reduced or adjusted, whether or not based on a formulation of the then current market price of the Common Stock (other than proportional adjustments as a result of subdivisions or combinations of the Common Stock or other Stock Events).

4.11 Company Repurchase. In the event that at any time after the Closing the U.S. government prohibits the ownership of the Shares by any Investor, unless otherwise required by such prohibition or by applicable law, the Company shall provide reasonable assistance to such Investor in selling the Shares, including by terminating the Lockup Period set forth in Section 4.2 and waiving the restrictions set forth in such Section. In the event such Investor is unable to sell any or all of the Shares to any third party or parties after using its reasonable best efforts to do so for a reasonable time period, which period shall not be in excess of one hundred and eighty (180) days or such other period in which the Company is obligated to divest the Shares, the Company shall, as soon as reasonably possible after such Investor notifies the Company that such Investor

has been unable to sell any or all of the Shares to any third party or parties, repurchase all of the Shares still held by such Investor at the Repurchase Price, unless the Company is prohibited from doing so pursuant to applicable law. In connection with such repurchase, the Company shall pay the Repurchase Price to such Investor by wire transfer of immediately available funds to an account or accounts designated by such Investor, and such Investor shall execute such stock powers as shall be necessary to surrender the Shares to the Company.

4.12 Beneficial Ownership Limitation. The Company shall not issue to the Investors, and the Investors shall use commercially reasonable efforts to not, following the Closing Date, acquire any shares of Common Stock from any third party to the extent that, upon such issuance or acquisition, the aggregate number of shares of Common Stock then beneficially owned by the Investors together with any of the Investors' Attribution Parties (including shares held by any "group" of which an Investor is a member) would exceed 9.9% of the total number of shares of Common Stock then issued and outstanding (the "**9.9% Cap**"). For the avoidance of doubt, any repurchase of shares of Common Stock by the Company or other action by the Company that has the effect of reducing the number of outstanding shares of Common Stock and thus causing the aggregate number of shares of Common Stock then beneficially owned by the Investors together with any of the Investors' Attribution Parties (including shares held by any "group" of which an Investor is a member) to exceed the 9.9% Cap (a "**Share Reduction Event**") shall in no event constitute a violation by any Investor of this Section 4.12; provided that the Company shall use its commercially reasonable efforts to promptly notify the Investors of the occurrence of any Share Reduction Event. For purposes hereof, "group" has the meaning set forth in Section 13(d) of the Exchange Act and applicable regulations of the Commission, and the percentage beneficially owned by the Investors and their Attribution Parties shall be determined in a manner consistent with the provisions of Section 13(d) of the Exchange Act.

Article V

CONDITIONS

5.1 Conditions to the Obligations of Each Party to Perform its Obligations under this Agreement. The respective obligations of each party to this Agreement shall be subject to the satisfaction at or prior to the applicable Closing Date of the following conditions:

(a) No Order. No Governmental Entity of competent jurisdiction shall have enacted, issued, promulgated, enforced or entered any statute, rule, regulation, executive order, decree, injunction, judgment, ruling or any other order (each, an "**Order**") which (i) is in effect and (ii) has the effect of preventing or making the issuance of the Shares pursuant to this Agreement illegal; and

(b) Government Approvals. With respect to the Second Closing, the Original Investor has received all consents, approvals or clearances from (or registration with, as applicable) the National Development and Reform Commission, the Ministry of Commerce, the State Administration of Foreign Exchange or their respective local counterparts, and/or any other Governmental Entities with jurisdiction over the Investor or the transactions contemplated by this Agreement.

(c) Termination. This Agreement shall not have been terminated in accordance with Section 7.1.

5.2 Additional Conditions to the Obligations of the Company. The obligation of the Company to consummate and effect the issuance of the Shares hereunder shall be subject to the satisfaction at or prior to the applicable Closing Date of each of the following conditions, any of which may be waived, in writing, exclusively by the Company:

(a) Representations and Warranties. The representations and warranties of the Investors set forth in this Agreement shall be true and correct in all material respects (except for those representations and warranties which are qualified as to materiality or Material Adverse Effect, in which case such representations and warranties shall be true and correct in all respects) on and as of the applicable Closing Date except for those representations and warranties which address matters only as of a particular date, which representations and warranties shall be true and correct in all material respects (except for those representations and warranties which are qualified as to materiality or Material Adverse Effect, in which case such representations and warranties shall be true and correct in all respects) as of such particular date.

(b) Agreements and Covenants. The applicable Investor shall have performed or complied in all material respects with its agreements and covenants required by this Agreement to be performed or complied with by Investor at or prior to the applicable Closing Date.

(c) Proceedings. There shall not be pending any suit or litigation challenging or seeking to restrain or prohibit the consummation of any of the transactions contemplated by this Agreement, including the issuance of the Shares.

(d) Purchase Price. The applicable Investor shall have paid the aggregate Purchase Price to the Company for the Shares being purchased by such Investor on such Closing Date.

5.3 Additional Conditions to the Obligations of the Investors. The obligations of the Investors to consummate and effect the purchase of the Shares hereunder shall be subject to the satisfaction at or prior to the applicable Closing Date of each of the following conditions, any of which may be waived, in writing, exclusively by the applicable Investor:

(a) Representations and Warranties. The representations and warranties of the Company set forth in this Agreement shall be true and correct in all material respects (except for those representations and warranties which are qualified as to materiality or Material Adverse Effect, in which case such representations and warranties shall be true and correct in all respects) on and as of the applicable Closing Date, except for those representations and warranties which address matters only as of a particular date, which representations and warranties shall be true and correct in all material respects (except for those representations and warranties which are qualified as to materiality or Material Adverse Effect, in which case such representations and warranties shall be true and correct in all respects) as of such particular date.

(b) Agreements and Covenants. The Company shall have performed or complied in all material respects with its agreements and covenants required by this Agreement to be performed or complied with by it at or prior to the Closing Date.

(c) Material Adverse Effect. Since the date of this Agreement, there shall not have occurred a Material Adverse Effect.

(d) Legal Opinion. The Investors shall have received the opinions of Pillsbury Winthrop Shaw Pittman, LLP, outside counsel to the Company, and Tonkon Torp, LLP as to Oregon matters, dated as of the Initial Closing Date, in a form reasonably acceptable to the Investors.

(e) Certified Charter. The Company shall have delivered to the Investors the articles of incorporation of the Company, certified by the Secretary of State of the State of Oregon as of a date within three (3) days of the Initial Closing Date.

(f) Good Standing Certificates. The Company shall have delivered to the Investors a certificate evidencing the incorporation or organization and good standing of the Company and each of its domestic Subsidiaries in such entity's state or other jurisdiction of incorporation or organization issued by the Secretary of State (or other applicable authority) of such state or jurisdiction of incorporation or organization as of a date within three (3) days of the Initial Closing Date.

(g) Transfer Agent Letter. The Company shall have delivered to the Investors a letter from the Transfer Agent certifying the number of shares of Common Stock outstanding as of a date within two (2) Business Days of the Initial Closing Date.

(h) Proceedings. There shall not be pending any suit or litigation challenging or seeking to restrain or prohibit the consummation of any of the transactions contemplated by this Agreement, including the issuance of the Shares.

(i) Nasdaq; Trading. The Company shall have filed with the Nasdaq Global Market a true and complete Notification Form: Listing of Additional Shares covering the Shares. No stop order or suspension of trading shall have been imposed by the Nasdaq Global Market or the SEC or any other Governmental Entity with respect to public trading in the Common Stock.

(j) Certified Resolutions. The Investors shall have received a certificate of the Company, validly executed for and on behalf of the Company and in its name by a duly authorized officer thereof, certifying the Organizational Documents and resolutions duly adopted by the Company Board or a duly authorized committee thereof authorizing the execution, delivery and performance of this Agreement and the transactions contemplated hereby, including the issuance and sale of the Shares.

(k) Issuance of Stock Certificates. The Company shall have issued a certificate or certificate(s) representing the Shares to the applicable Investor as in accordance with Section 2.2(a).

(l) Officer's Certificate. The applicable Investor shall have received a certificate of the Company, validly executed for and on behalf of the Company and in its name by a duly authorized officer thereof, certifying as to the matters set forth in clauses (a), (b), (c), (i) and (j) of this Section 5.3.

Article VI INDEMNIFICATION

6.1 Company Indemnification Obligation. In consideration of the Investors' execution and delivery of this Agreement and acquiring the Shares hereunder and in addition to all of the Company's other obligations under this Agreement, the Company shall indemnify and hold harmless the Investors and each other holder of the Shares entitled to rights hereunder and all of their stockholders, partners, officers, directors, members, managers, employees and any of

the foregoing Persons' agents or other representatives (including those retained in connection with the transactions contemplated by this Agreement) (collectively, the "**Indemnitees**") from and against any and all actions, causes of action, suits, claims, losses, costs, penalties, fees, liabilities and damages (unless such action, cause of action, suit, claim, loss, cost, penalty, fee, liability or damage is based upon a breach of an Investor's representations, warranties or covenants hereunder, or any violations by an Investor of state or federal securities laws or any conduct by an Investor which constitutes fraud, gross negligence, willful misconduct or bad faith, and expenses in connection therewith, and including reasonable and documented attorneys' fees and disbursements (the "**Indemnified Liabilities**"), incurred by any Indemnitees as a result of, or arising out of, (i) any misrepresentation or breach of any representation or warranty made by the Company in this Agreement, (ii) any breach of any covenant, agreement or obligation of the Company contained in this Agreement, or (iii) any violations by the Company of state or federal securities laws in connection with this Agreement or the Company's performance of its obligations hereunder, or any conduct by the Company which constitutes fraud, gross negligence, willful misconduct or bad faith, in connection with this Agreement or the Company's performance of its obligations hereunder. To the extent that the foregoing undertaking by the Company may be unenforceable for any reason, the Company shall make the maximum contribution to the payment and satisfaction of each of the Indemnified Liabilities that is permissible under applicable law.

6.2 Indemnification Procedures. Each Indemnitee shall (i) give prompt written notice to the Company of any claim with respect to which it seeks indemnification pursuant to this Agreement (provided, however, that the failure of the Indemnitee to promptly deliver such notice shall not relieve the Company of any liability, except to the extent that the Company is actually prejudiced in its ability to defend such claim) and (ii) permit the Company to assume the defense of such claim with counsel selected by the Company and reasonably satisfactory to the Indemnitee; provided, however, that any Indemnitee entitled to indemnification hereunder shall have the right to employ separate counsel and to participate in the defense of such claim, but the reasonable fees and expenses of such counsel shall be at the expense of the Indemnitee unless (A) the Company has agreed in writing to pay such fees and expenses, (B) the Company shall have failed to assume the defense of such claim within ten (10) days of delivery of the written notice of the Indemnitee with respect to such claim or failed to employ counsel selected by the Company and reasonably satisfactory to the Indemnitee, or (C) based upon the written advice of Indemnitee's counsel, a material conflict of interest exists between the Indemnitee and the Company with respect to such claims (in which case, if the Indemnitee notifies the Company in writing that it elects to employ separate counsel at the expense of the Company, the Company shall not have the right to assume the defense of such claim on behalf of the Indemnitee); provided, however, that in no event shall the Company be responsible for the fees and expenses of more than one counsel for all Indemnitees (in addition to local counsel) and the Company shall only be responsible for reasonable and documented attorneys' fees and expenses. If the Company assumes the defense of the claim, it shall not be subject to any liability for any settlement or compromise made by the Indemnitee without its consent (but such consent shall not be unreasonably withheld, conditioned or delayed). In connection with any settlement negotiated by the Company, the Company shall not, and no Indemnitee shall be required by the Company to, (I) enter into any settlement which does not include as an unconditional term thereof the giving by the claimant or plaintiff to the Indemnitee of a release from all liability in respect to such claim or litigation, or (II) enter into any settlement that attributes by its terms any liability,

culpability or fault to the Indemnitee. In addition, without the consent of the Indemnitee, the Company shall not consent to entry of any judgment or enter into any settlement which provides for any obligation or restriction on the part of the Indemnitee other than the payment of money damages which are to be paid in full by the Company. If the Company fails or elects not to assume the defense of a claim pursuant to clause (B) above, or is not entitled to assume or continue the defense of such claim pursuant to clause (C) above, the Indemnitee shall have the right without prejudice to its right of indemnification hereunder to, in its discretion exercised in good faith and upon advice of counsel, to contest, defend and litigate such claim, provided, however, that Indemnitee shall not consent to entry of any judgment or enter into any settlement in respect thereof without the prior consent of the Company (but such consent shall not be unreasonably withheld, conditioned or delayed). To the extent that an Indemnitee wishes to seek indemnification under this Article VI, such Indemnitee must provide the Company with written notice asserting a claim under this Article VI, with such notice to be provided within eighteen (18) months from the Initial Closing. If an Indemnitee fails to provide such written notice in respect of any claim within this 18-month period, the Indemnitee shall no longer be entitled to indemnification by the Company hereunder in respect of such claim.

Article VII

MISCELLANEOUS

7.1 Termination. This Agreement may be terminated by the Company by written notice to the other parties, if the Closing has not been consummated by the date that is sixty (60) days following the date of this Agreement; provided, however, that the right to terminate this Agreement shall not be available to the Company if the Company's failure to comply with its obligations under this Agreement has been the cause of or resulted in the failure of the Closing to occur on or before such time, and provided further that no such termination will affect the right of any party to sue for any breach by the other party (or parties) and shall not affect any provisions hereof that expressly survive termination in accordance with the terms hereof.

7.2 Fees and Expenses. Except as expressly set forth herein, each party shall pay the fees and expenses of its advisers, counsel, accountants and other experts, if any, and all other expenses incurred by such party incident to the negotiation, preparation, execution, delivery and performance of this Agreement and the transactions contemplated hereby.

7.3 Entire Agreement. This Agreement, together with the exhibits and schedules hereto, contain the entire understanding of the parties with respect to the subject matters hereof and supersede all prior agreements and understandings, oral or written, with respect to such matters, which the parties acknowledge have been merged into such documents, exhibits and schedules. At or after the Closing, and without further consideration, the Company will execute and deliver to the Investors such further documents as may be reasonably requested in order to give practical effect to the intention of the parties hereunder.

7.4 Amendments; Waivers. No provision of this Agreement may be waived or amended except in a written instrument signed, in the case of an amendment, by the Company and each Investor. No waiver of any default with respect to any provision, condition or requirement of this Agreement shall be deemed to be a continuing waiver in the future or a waiver of any subsequent default or a waiver of any other provision, condition or requirement

hereof, nor shall any delay or omission of either party to exercise any right hereunder in any manner impair the exercise of any such right.

7.5 Notices. Any and all notices or other communications or deliveries required or permitted to be provided hereunder shall be in writing and shall be deemed given and effective on the earliest of (a) the date of transmission, if such notice or communication is delivered via facsimile or email at the facsimile number or email address specified in this Section prior to 6:30 p.m. (Pacific Time) on a Business Day, (b) the next Business Day after the date of transmission, if such notice or communication is delivered via facsimile or email at the facsimile number or email address specified in this Section on a day that is not a Business Day or later than 6:30 p.m. (Pacific Time) on any Business Day, (c) the Business Day following the date of deposit with a nationally recognized overnight courier service, or (d) upon actual receipt by the party to whom such notice is required to be given. The addresses, facsimile numbers and email addresses for such notices and communications are those set forth on the signature pages hereof, or such other address or facsimile number as may be designated in writing hereafter, in the same manner, by any such Person.

7.6 Construction. The headings herein are for convenience only, do not constitute a part of this Agreement and shall not be deemed to limit or affect any of the provisions hereof. The language used in this Agreement will be deemed to be the language chosen by the parties to express their mutual intent, and no rules of strict construction will be applied against any party. Unless the context otherwise requires, (i) all references to Sections, Schedules or Exhibits are to Sections, Schedules or Exhibits contained in or attached to this Agreement, (ii) each accounting term not otherwise defined in this Agreement has the meaning assigned to it in accordance with GAAP, (iii) words in the singular or plural include the singular and plural and pronouns stated in either the masculine, the feminine or neuter gender shall include the masculine, feminine and neuter, (iv) the use of the word “including” in this Agreement shall be by way of example rather than limitation, and (v) the word “or” shall not be exclusive.

7.7 Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties and their successors and permitted assigns. The Company may not assign this Agreement or any rights or obligations hereunder (except, following the Closing, by merger or in connection with another entity acquiring all or substantially all of the Company’s assets) without the prior written consent of the Investors. Neither Investor may assign this Agreement or any rights or obligations hereunder without the prior written consent of the Company (which consent shall not, following the Closing, be unreasonably withheld), except that an Investor may transfer or assign its rights and obligations under this Agreement, in whole or in part, to one or more of its respective Affiliates at any time so long as such Investor provides prior notice thereof to the Company, and provided that such transfer or assignment will not relieve such Investor of any of its obligations hereunder.

7.8 Persons Entitled to Benefit of Agreement. This Agreement shall inure to the benefit of and be binding upon the Company and the Investors and their respective successors and permitted assigns and, to the extent provided in Article VI, each Indemnitee. Nothing expressed or mentioned in this Agreement is intended or shall be construed to give any Person, other than those Persons mentioned in the preceding sentence or otherwise explicitly mentioned in this Agreement, any legal or equitable right, remedy or claim under or in respect of this Agreement, or any provisions herein contained, this Agreement and all conditions and provisions

hereof being intended to be and being for the sole and exclusive benefit of such Persons and for the benefit of no other Person.

7.9 Governing Law; Venue; Waiver of Jury Trial. THE CORPORATE LAWS OF THE STATE OF NEW YORK SHALL GOVERN ALL ISSUES CONCERNING THE RELATIVE RIGHTS OF THE COMPANY AND ITS SHAREHOLDERS. ALL QUESTIONS CONCERNING THE CONSTRUCTION, VALIDITY, ENFORCEMENT AND INTERPRETATION OF THIS AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK. THE COMPANY AND THE INVESTORS HEREBY IRREVOCABLY SUBMIT TO THE EXCLUSIVE JURISDICTION OF THE STATE AND FEDERAL COURTS SITTING IN NEW YORK COUNTY FOR THE ADJUDICATION OF ANY DISPUTE BROUGHT BY THE COMPANY OR THE INVESTORS, IN CONNECTION HEREWITH OR WITH ANY TRANSACTION CONTEMPLATED HEREBY OR DISCUSSED HEREIN (INCLUDING WITH RESPECT TO THE ENFORCEMENT OF THIS AGREEMENT), AND HEREBY IRREVOCABLY WAIVE, AND AGREE NOT TO ASSERT IN ANY SUIT, ACTION OR PROCEEDING BROUGHT BY THE COMPANY OR THE INVESTORS, ANY CLAIM THAT IT IS NOT PERSONALLY SUBJECT TO THE JURISDICTION OF ANY SUCH COURT, OR THAT SUCH SUIT, ACTION OR PROCEEDING IS IMPROPER. EACH PARTY, AFTER CONSULTING OR HAVING HAD THE OPPORTUNITY TO CONSULT WITH COUNSEL, KNOWINGLY, VOLUNTARILY AND INTENTIONALLY WAIVES IRREVOCABLY, ANY RIGHT TO A TRIAL BY JURY IN ANY ACTION OR PROCEEDING TO ENFORCE OR DEFEND ANY RIGHTS ARISING OUT OF OR RELATING TO THIS AGREEMENT (INCLUDING WITH RESPECT TO THE ENFORCEMENT OF THIS AGREEMENT) AND SUCH PROCEEDING SHALL BE TRIED BEFORE A COURT AND NOT BEFORE A JURY.

7.10 Execution. This Agreement may be executed in two counterparts, both of which when taken together shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other party, it being understood that both parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission or email attachment, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or email-attached signature page were an original thereof.

7.11 Survival. The representations and warranties of the Company contained herein shall survive the Closing. The covenants of the Company and the Investors contained in this Agreement shall terminate on the Closing Date; provided, that the covenants that by their terms are required to be performed in whole or in part following the Closing Date shall survive the Closing Date.

7.12 Severability. If any provision of this Agreement is prohibited by law or otherwise held to be invalid or unenforceable in any respect, the validity and enforceability of the remaining terms and provisions of this Agreement shall not in any way be affected or impaired thereby and the parties will attempt to agree upon a valid and enforceable provision that is a reasonable substitute therefor, and upon so agreeing, shall incorporate such substitute provision in this Agreement.

7.13 Independent Nature of Investors' Obligations and Rights. Each Investor's rights and obligations in respect of the purchase of its respective portion of the Shares as provided herein shall be several and independent. The liabilities of each Investor under this Agreement are several and not joint, and no Investor is responsible in any way for the performance or conduct of any other Investor in connection with the transactions contemplated hereby. Nothing contained herein, and no action taken by any Investor pursuant hereto, shall be or shall be deemed to constitute a partnership, association, joint venture, or joint group with respect to the Investors. Each Investor agrees that no other Investor has acted as an agent for such Investor in connection with the transactions contemplated hereby.

7.14 Remedies. In addition to being entitled to exercise all rights provided herein or granted by law, including recovery of damages, each of the Investors and the Company will be entitled to specific performance hereunder (without posting a bond or other security or proving actual damages). Each of the parties agrees that monetary damages would not be adequate compensation for any loss incurred by reason of any breach of obligations described in the foregoing sentence and hereby agrees to waive in any action for specific performance of any such obligation (other than in connection with any action for temporary restraining order) the defense that a remedy at law would be adequate.

7.15 Amendment and Restatement of the Prior Agreement. The Company and the Investors hereby agree that, as of the date of this Agreement, (i) the Prior Agreement is hereby amended and restated in its entirety by this Agreement, (ii) the provisions of the Prior Agreement shall be no longer of any force or effect, and (iii) the Company and the Investors shall be bound by the terms of this Agreement.

[SIGNATURE PAGES TO FOLLOW]

IN WITNESS WHEREOF, the parties hereto have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

PIXELWORKS, INC.

By: /s/ Todd DeBonis

Name: Todd DeBonis

Title: President and Chief Executive Officer

Address for Notice:

226 Airport Parkway, Suite 595
San Jose, California 95110
Email: tdebonis@pixelworks.com

with a copy (which shall not constitute notice) to:

Pillsbury Winthrop Shaw Pittman LLP
2550 Hanover Street
Palo Alto, CA 94304
Facsimile No.: (650) 233-4545
Telephone No.: (650) 233-4537
Attn: Christina F. Pearson
Email: christina.pearson@pillsburylaw.com

IN WITNESS WHEREOF, the parties hereto have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

MTM-XINHE INVESTMENT LIMITED

By: /s/ Wang Jun

Name: Wang Jun

Title: President

Address for Notice:

3303-3306, S2, BFC, No.600 Zhongshan Road
(E-2), Huangpu District, Shanghai, 200001
Email: wangjun@mtmcapital.cn

with a copy (which shall not constitute notice) to:

Katten Muchin Rosenman LLP
Suite 4906 Wheelock Square
1717 Nanjing Road West
Shanghai, P.R. China 200040
Facsimile No.: +86.21.6039.3223
Telephone No.: +86.21.6039.3218
Email: lijie.han@katten.com

And to:

Katten Muchin Rosenman LLP
525 West Monroe Street
Chicago, IL 60661
Facsimile No.: (312) 902-5493
Telephone No.: (312) 902-1061
Attn: Mark D. Wood
Email: mark.wood@katten.com

IN WITNESS WHEREOF, the parties hereto have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

CloudAlpha Master Fund

By: /s/ Yang Jin

Name: Yang Jin

Title: Director

Address for Notice:

9th Floor, Southland Building, 48 Connaught Road
Central, Hong Kong

Email: ny@cloudalphacap.com,
cw@cloudalphacap.com, ap@cloudalphacap.com

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Pixelworks, Inc.:

We consent to the incorporation by reference in the registration statements (Nos. 333-239466, 333-233210, 333-227352, 333-219418, 333-212650, 333-205856, 333-197644, 333-190037, 333-182701, 333-168175, 333-161125, 333-152945, and 333-136553) on Form S-8 and registration statement (No. 333-249934) on Form S-3 of Pixelworks, Inc. of our report dated March 10, 2021, with respect to the consolidated balance sheet of Pixelworks, Inc. as of December 31, 2020, the related consolidated statements of operations, comprehensive loss, shareholders' equity, and cash flows for the year ended December 31, 2020, and the related notes, which report appears in the December 31, 2020 annual report on Form 10-K of Pixelworks, Inc.

/s/ Armanino LLP

San Ramon, California
March 10, 2021

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Pixelworks, Inc.:

We consent to the incorporation by reference in the registration statements (Nos. 333-239466, 333-233210, 333-227352, 333-219418, 333-212650, 333-205856, 333-197644, 333-190037, 333-182701, 333-168175, 333-161125, 333-152945, and 333-136553) on Form S-8 and registration statement (No. 333-249934) on Form S-3 of Pixelworks, Inc. of our report dated March 11, 2020, with respect to the consolidated balance sheet of Pixelworks, Inc. as of December 31, 2019, the related consolidated statements of operations, comprehensive loss, shareholders' equity, and cash flows for the year ended December 31, 2019, and the related notes, which report appears in the December 31, 2020 annual report on Form 10-K of Pixelworks, Inc.

/s/ KPMG LLP

Portland, Oregon
March 10, 2021

CERTIFICATION

I, Todd A. DeBonis, certify that:

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

Date: March 10, 2021

By: /s/ Todd A. DeBonis
Todd A. DeBonis
President and Chief Executive Officer
(Principal Executive Officer)

CERTIFICATION

I, Elias N. Nader, certify that:

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

Date: March 10, 2021

By: /s/ Elias N. Nader

Elias N. Nader
Vice President and Chief Financial Officer (Principal Financial Officer)

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

In connection with the Annual Report of Pixelworks, Inc. (the "Company") on Form 10-K for the year ended December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Todd A. DeBonis, President and Chief Executive Officer of the Company, certify, pursuant to Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. 1350), as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

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

By: /s/ Todd A. DeBonis
Todd A. DeBonis
President and Chief Executive Officer
(Principal Executive Officer)

Date: March 10, 2021

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

In connection with the Annual Report of Pixelworks, Inc. (the "Company") on Form 10-K for the year ended December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Elias N. Nader, Vice President and Chief Financial Officer of the Company, certify, pursuant to Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. 1350), as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

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

By: /s/ Elias N. Nader

Elias N. Nader
Vice President and Chief Financial Officer (Principal Financial Officer)

Date: March 10, 2021