PIXELWORKS, INC
Form 10-K
March 06, 2013

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

FORM 10-K

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

For the fiscal year ended December 31, 2012

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)	91-1761992 (I.R.S. Employer Identification No.)
224 Airport Parkway, Suite 400, San Jose, CA (Address of principal executive offices)	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	Name of each exchange on which registered
Common Stock	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 x

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 x

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 x No ¨

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, 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 and post such files). Yes x No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form

10-K. ¨

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

Large accelerated filer	¨	Accelerated filer	¨
Non-accelerated filer	¨	Smaller reporting company	x

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

Aggregate market value of voting Common Stock held by non-affiliates of the registrant at June 30, 2012: $32,198,782. For purposes of this calculation, executive officers and directors are considered affiliates.

Number of shares of Common Stock outstanding as of February 28, 2013: 18,454,540

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, 2012.

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FOR THE YEAR ENDED DECEMBER 31, 2012
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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. Actual results could vary materially from those contained in forward looking statements due to many factors, including, without limitation: our ability to deliver new products in a timely fashion; our new product yield rates; changes in estimated product costs; product mix; 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; the success of our products in expanded markets; current global economic challenges; levels of inventory at distributors and customers; changes in the digital display and projection markets; changes in customer ordering patterns or lead times; seasonality in the consumer electronics market; insufficient, excess or obsolete inventory and variations in inventory valuation; litigation related to our intellectual property rights; our limited financial resources; economic and political challenges due to operations in Asia; failure to retain or attract qualified employees; fluctuations in foreign currencies; natural disasters, and 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 or correct one or more forward-looking statements, you should not conclude that we will make additional updates or corrections 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

We are an innovative designer, developer and marketer of video and pixel processing semiconductors and software for high-end digital video applications and hold 120 patents related to the visual display of digital image data. Our solutions enable manufacturers of digital display and projection devices, such as large-screen flat panel televisions and digital front projectors, to manufacture their products with a consistently high level of video quality, regardless of the content's source or format. Our core technology leverages unique proprietary techniques for intelligently processing video signals from a variety of sources to ensure that all resulting images are optimized. Additionally, our products help our customers reduce costs and differentiate their display and projection devices, an important factor in industries that experience rapid innovation.

Our business also includes the license of technologies developed for our integrated circuit ("IC") semiconductor products to customers and partners, as well as co-development arrangements with current or prospective IC customers. Pixelworks was founded in 1997 and is incorporated under the laws of the state of Oregon.

Pixelworks' flexible design architecture enables our technology to produce outstanding image quality in our customers' products with a range of single-purpose integrated circuits ("ICs"), to system-on-chip ("SoC") ICs that integrate microprocessor, memory and image processing functions. Additionally, we provide full solutions, including a software development environment and operating system, which enable our customers to more quickly develop and customize their display products, thus reducing their time to market and allowing them to incorporate differentiated features and functions.

Our primary target markets are liquid crystal display ("LCD") large-screen televisions and 3LCD and digital light processing ("DLP") digital front projectors, however we also target other segments within the flat panel display market, including digital signage.

We have adopted a product strategy that leverages our core competencies in video display processing technology to address the evolving needs of the advanced flat panel display, digital projection and other markets that require superior image quality. We focus our product investments on developing video enhancement solutions for these markets, with particular focus on adding increased performance and functionality. Additionally, we look for ways to leverage our research and development investment into products that address other high-value markets where our innovative proprietary technology provides differentiation for us and our customers. We continually seek to expand our technology portfolio through internal development, co-development with business partners and evaluation of acquisition opportunities.

Digital Video Technology Trends

Over the course of the last several years, video technology has moved rapidly from analog technology, which utilizes waveform signals, to a new generation of digital technologies that utilize a grid of thousands of tiny picture elements, or pixels. Consequently, digital display devices have rapidly evolved to incorporate higher pixel counts and faster rates of screen refresh, both of which contribute to a sharper, clearer image. At the same time, digital display devices have increased in size and begun to incorporate newer video capabilities such as high-definition and, most recently, 3D and Ultra HD. Accordingly, the video image processors that drive newer displays have had to increase their capabilities as well to keep pace with the ever growing needs for greater resolution, size and speed that digital technology affords.

The number and variety of digital video applications is increasing rapidly, and video is expanding to play a pervasive role across many aspects of business and personal lifestyle. Digital video content is being delivered from an increasing array of sources that vary dramatically in quality—on Blu-ray DVDs, via cable and satellite, across the Internet and on cell phones and smart devices. The sources and quality of video content range from very high-resolution programming produced by network or movie studios to very poor quality clips created by individuals. In the aggregate, video content is expected to increase to previously unimaginable levels in the next 3 years, according to a recent study by Cisco Systems, with Internet video traffic increasing to 55% of all consumer Internet traffic, accounting for 1.2 million minutes of video crossing the network every second.

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Regardless of the source or quality, increasingly, consumers are sharing video with others and viewing video on a growing array of form factors—from handheld devices to large screen displays. At the same time, the consumer expectation for ever higher quality video continues to rise, driven by higher display resolutions on larger TVs. These trends place new demands on video signal and pixel processing technology to enable display and projection devices to provide the best viewing experience possible across multiple display formats. For example, content created for one type of display device, such as a PC, must be scaled up or down to play back clearly on a different device, such as a television. On larger, higher-resolution TV screens, image quality deteriorates significantly, and must be compensated for with video processing technology that restores or even creates higher video quality. This trend is exemplified further by the increasing desire to display low resolution and low bit rate user content from social media sites. In addition, new over the top video services designed to replace existing TV programming services rely heavily on the display being able to reconstruct a better image in order to improve the quality of service over bandwidth varying communications links, such as the Internet.

With continuous improvements in manufacturing technology, the latest generations of advanced digital display are fulfilling the consumer’s desire for a more immersive experience. The latest generations of advanced digital display devices enhance image performance in a number of ways, chief among them being increasing the size of the display, increasing the display resolution and increasing the number of times per second the image is refreshed. Premium displays currently feature "full HD" resolutions of 1920 columns by 1080 rows of pixels progressively scanned ("1080p"), display frame rates of 240Hz or more, are 3D ready and measure from 32 inches to 84 inches or more diagonally. The size and resolution of the display are expected to continually increase. Display manufacturers and content providers are pursuing the evolution from "full HD" to Ultra High Definition, or "Ultra HD." Ultra HD displays will offer resolutions in excess of 3,840 pixels horizontally and 2,160 lines vertically. Such a change in resolution offers the display an increased ability to display fine detail previously absent in "full HD" content and displays, creating a demand for more advanced image processing. In addition to the need for image enhancement, various applications, such as digital signage, Internet-enabled televisions and connected classroom environments, are creating a need for new networking capabilities that can enable the sharing of video across display devices and display environments. This desire drives the need for innovative solutions to an increasingly more complex usage model where content can seamlessly be transferred from device to device and all displays interoperate with one another to create an enhanced usage model for the consumer.

Large-Screen Flat Panel Display Market

The market for flat panel TVs has risen rapidly over the past decade and is projected to be worth more than $100 billion in sales annually by 2013, according to the industry research firm NPD DisplaySearch. Key segments of growth within the flat panel display industry are consumer applications, such as PC monitors and digital televisions. Digital TVs in particular have transformed the flat panel market, as consumers have enthusiastically embraced advanced television displays that offer sharper and more lifelike images on larger and thinner screens. Increasingly, commercial applications such as public-space advertising, a form of digital signage, are also contributing to the growth of the flat panel market and the drive to improve the image and video quality of the panels themselves.

Flat panel display technologies include LCD, plasma display, rear-projection using LCDs, digital micro-mirror, and newer technologies, such as liquid crystal on silicon ("LCoS") and organic light emitting diodes ("OLED"). Within flat panel displays, LCD and plasma have emerged as the preferred digital display technologies, with LCD leading the market in growth. The digital TV market and its high volume penetration with consumers has helped to secure the dominance of LCD technology. Shipments of LCD TVs are expected to account for around 92% of all TVs sold and grow from 205 million units in 2012 to 216 million units in 2013, according to NPD DisplaySearch.

A large consumer market has pressured flat panel manufacturers to continually improve the quality of their displays, and as a result LCDs and other flat panel displays continue to increase in resolution and size. 1080p resolution is now the high-end standard but is expected to be replaced by 4kx2k or larger. Larger flat panel displays are shifting rapidly from refresh rates of 50/60Hz to faster rates of 100/120Hz, 200/240Hz and even 400/480Hz. The shift to large, high-resolution flat panel displays combined with the transition to Ultra HD content and higher refresh rates is driving the need for high performance processor solutions to meet the enhanced video quality requirements of next generation display products. As flat panel display resolution and size increase, the challenge of "judder" becomes more of an issue. Judder occurs when content recorded at one rate of frames per second for film content must be converted to

faster video rates, and as a result there is a jerkiness, or judder in the resulting video performance. This problem is intensified in larger displays and can be a problem regardless of the panel technology being used.

In addition to judder, LCD panels also suffer from blur in motion images as a result of the way the human brain processes the longer frame durations produced by an LCD panel. In the past, LCD panel manufacturers have tried to reduce blur by increasing the refresh rate of the panel to higher rates and inserting an extra "black" frame to reduce frame duration. But the black frame insertion method has had drawbacks—one of which was to make LCD screens seem less bright. Newer motion estimation/motion compensation ("MEMC") technology uses the insertion of interpolated frames based on complex mathematical algorithms to shorten the duration of the video frame and create a clearer, crisper picture. MEMC also provides de-judder processing that smoothes out the jerkiness often apparent with large screen displays.

In recent years, TV manufacturers have added new design elements and performance features to differentiate their products and slow price declines. Among these are the adoption of light emitting diode ("LED") backlighting, an emphasis on lower power consumption, Internet connectivity and the development of 3D-enabled TVs. All of these trends are driving the need for high performance processor solutions to meet the enhanced video quality requirements of next generation display products.

LED backlighting enables higher contrast images in more advanced TVs. Manufacturers can use either dynamic color LEDs that are positioned behind the panel and allow for local area dimming, which provides higher contrast on selected sections of the screen; or white edge-LEDs positioned around the rim of the screen, which use a special diffusion panel to spread the light evenly behind the screen. LED backlighting also serves as a critical enabler of reduced power consumption. Because of its advantages, LED backlighting is expected to achieve an 88% share of LCD TV shipments in 2013, according to NPD DisplaySearch. LED backlighting requires a video processing control mechanism that determines when certain LEDs are lit, and how brightly, based on the video being displayed.

Consumers’ desire to use their televisions to view Internet content ranging from YouTube videos to downloaded high definition movies from Netflix and other vendors is driving TV manufacturers to incorporate Internet connectivity into their products, including those marketed as "smart" TVs. In addition to simple connectivity, these devices must also be able to scale and enhance Internet content so as to be optimally viewed on a large flat panel display. Limitations in bandwidth, latency, noise and content resolution create significant challenges, and video processors must be able to scale poorer quality video, reduce signal noise inherent to networks and enhance image quality in order to ensure optimal video performance. NPD DisplaySearch estimates that consumer-controlled (open Internet access) smart TVs shipped will grow from 41 million units in 2012 to 85 million units in 2016.

Increasing screen sizes, higher pixel resolutions, higher frame rates, the desire to view Internet content on high-resolution displays, LED backlighting, 3D and other trends all present video performance challenges that must be addressed and are exacerbated with each new cycle of additional features. To differentiate their products, advanced flat panel manufacturers must implement video processing technologies that address these video performance issues as rapidly, as fully and as cost effectively as possible. Additionally, the interplay of performance, features, cost and power consumption is a key area of differentiation for digital television manufacturers. Most features and performance improvements carry cost premiums and increased power consumption, but intelligent design and utilization of appropriate video processing technologies can enable simultaneous improvements.

Digital Projection Market

Increasingly affordable price points are driving continued adoption of digital projectors in business and education, as well as among consumers. Technology improvements are helping reduce the size and weight of projection devices and 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 (formerly Pacific Media Associates), the worldwide front projector market maintained sales levels of 9.5 million units in 2012 and 2011, up from 8.5 million units in 2010.

Currently, the largest segment of the installed front projector market consists of business users who employ multimedia projectors to display both still and video presentation materials from PCs or other sources. Requirements for the business market include portability, compatibility with multiple software and hardware applications and features that ensure simple operation. In educational environments from elementary schools to university campuses, projectors help teachers integrate media-rich instruction into classrooms. Growth in overall projector sales is expected to come both from the business sector and the education market. Tiny, battery powered "pico" projectors embedded in a cell phone or PC, or available as independent devices weighing less than a pound, also are beginning to take hold in

the consumer and business markets, fueled by their capability to display video content on a larger surface area.

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.

Additional Markets

In addition to the large-screen flat panel display and digital projection markets, other markets are also taking advantage of the trend towards higher performance and connectivity in digital video technology. Some of the applications expected to grow as a result of enhanced video quality include digital signage, video conferencing and specialty monitors. Also, smaller screen displays are seeing higher pixel resolutions and increased pixel density creates a need for video display processing technology as the consumption of video moves to devices of all sizes. Worldwide, the emerging economies of Brazil, Russia, India and China, commonly referred to collectively as "BRIC," are expected to be a leading driver of demand for information technology of all kinds, including projectors for business, education and the consumer sectors.

Our Core Technologies and Products

We have developed a portfolio of advanced video algorithms and intellectual property ("IP") to address a broad range of challenges in digital video. Our technologies can dramatically improve video quality and are increasingly important as screen size and resulting quality issues 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 powerful combinations within single products and can be applied to practically any device, including tablets and ultrabooks. The majority of our products include one or more technologies to provide high-quality video solutions to our customers, regardless of screen size.

Some of our proprietary core video display technologies include:

- MEMC (motion estimation/motion compensation). Our proprietary MEMC technology significantly improves the performance and viewing experience of large advanced LCD panels by solving problems such as motion blur and judder. It also supports significant digital TV trends such as 3D, LED backlight local dimming (both edge-lit and full array) and 240Hz and higher frame rates. Additionally, our MEMC technology improves video performance in non-TV applications such as video conferencing, 3D gaming and projection.
- 2D to 3D conversion. Our proprietary 2D to 3D conversion technology offers 3D display systems the ability to provide a sense of depth to existing 2D content and displays it in 3D. Given the limited availability of native 3D content and virtually unlimited 2D content, this technology is a cornerstone for any 3D display system.
- Networking. Our networking technology enables the same video stream to be networked across multiple displays, for applications such as connected video projection and digital signage.
- Digital keystone correction. Our technology provides enhanced keystone and image correction performance for digital projection systems, particularly for "short throw" projectors which must project clearly at severe angles due to space limitations.

Our product development strategy is to leverage our expertise in video processing to address the evolving needs of the advanced flat panel display, digital projection and other markets that require superior image quality. We plan to continue to focus our development resources to maintain our market lead and provide leading edge solutions for the advanced 3LCD and DLP digital projection markets and to enhance our video processing solutions for advanced flat panel displays and other emerging markets. Additionally, we look for ways to leverage our research and development investment into products that address high-value markets, such as mobile, where our innovative proprietary technology provides differentiation for us and our customers. We deliver our technology in a variety of offerings, which take the form of single-purpose chips, highly integrated SoCs that incorporate specialized software, and full solutions incorporating software and other tools.

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 such as projectors and high-resolution flat panels. 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 in conjunction with an image processor to post-process video signals in order 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 by a display manufacturer 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.
- Networked Display ICs. Our Networked Display ICs allow the same video stream to be networked across multiple displays, for example to connect projectors in different classrooms or to enable networked streaming of video in digital signage applications. Our Networked Display IC combines video sharing capabilities with video image processing, wireless connectivity and Internet connection to ensure high quality, multi-source video output and enhanced value to our projection display customers.

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 targeted 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 the U.S., China, Taiwan, Japan and Korea 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 distributor 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 74%, 69% and 61% of revenue in 2012, 2011 and 2010, respectively.

Our largest distributor, Tokyo Electron Device Ltd. ("TED"), is located in Japan. TED represented 50%, 53% and 44% of revenue in 2012, 2011 and 2010, respectively, and accounted for 35% and 54% of accounts receivable at December 31, 2012 and 2011, respectively. No other distributor accounted for more than 10% of revenue in 2012, 2011 and 2010.

We also have distributor relationships in Taiwan, China, Korea, Europe, Southeast Asia 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 26%, 31% and 39% of total revenue in 2012, 2011 and 2010, respectively.

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

- Integrators. Integrators are original equipment manufacturers 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 represented 53%, 51% and 58% of revenue in 2012, 2011 and 2010, respectively. End customers include customers who purchase directly from us as well as customers who purchase products indirectly through distributors. Sales to each of Panasonic Corporation and Hitachi represented more than 10% of revenue in 2012, 2011, and 2010. Sales to Seiko Epson Corporation represented more than 10% of revenue in 2011 and 2010. No other end customer accounted for more than 10% of revenue in 2012, 2011 or 2010.

Seasonality

Our business is subject to seasonality related to the markets we serve and the location of our customers. We have historically experienced higher revenue from the multimedia 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. Additionally, holiday demand for consumer electronics, including high-end televisions, has sometimes contributed to increased revenue in the second half of the year. Our sales in 2010, however, did not follow our historical trends due in part to the adverse global crisis in the credit and financial markets, continued economic uncertainty and reductions in consumer spending during that year. In 2011 and 2012 our sales returned to historical seasonal patterns.

Geographic Distribution of Sales

Sales outside the U.S. accounted for approximately 90% of revenue in 2012 and 96% of revenue in 2011 and 2010. Financial information regarding our domestic and foreign operations is presented in "Note 11: 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. Our entire order backlog is cancelable, with a portion subject to cancellation fees. 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

In general, the semiconductor industry is intensely competitive. The markets for higher performance display and projection devices, including the markets for advanced flat panel display televisions, multimedia 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 are 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.

Our current products face competition from specialized display controller developers and in-house display controller ICs designed by our customers and potential customers. Additionally, new alternative display processing technologies and industry standards may emerge that directly compete with technologies that we offer.

We compete with specialized and diversified electronics and semiconductor companies that offer display processors or scaling components. Some of these include Actions Microelectronics Co., Ltd., i-Chips Technologies Inc., Intersil Corporation, MediaTek Inc., MStar Semiconductor, Novatech Co., Ltd. Inc., NVIDIA Corporation, QUALCOMM Incorporated, Realtek Semiconductor Corp., Renesas Electronics America, Sigma Designs, Inc., Silicon Image, Inc., STMicroelectronics N.V., Sunplus Technology Co., Ltd., Texas Instruments Incorporated, and other companies. Potential and current competitors may include diversified semiconductor manufacturers and the semiconductor divisions or affiliates of some of our customers, including LG Electronics, Inc., Matsushita Electric Industrial Co., Ltd., Mitsubishi Digital Electronics America, Inc., NEC Corporation, Samsung Electronics Co., Ltd., SANYO Electric Co., Ltd., 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

Our internal research and development efforts are focused on the development of our solutions for the multimedia projector, high-end television, and mobile device 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 for our customers.

We have invested, and expect to continue to invest, significant resources in research and development activities. Our research and development expense was $20.8 million, $22.9 million and $22.8 million in 2012, 2011 and 2010, respectively. During 2012, we received a reimbursement related to a co-development arrangement with a customer for costs incurred in connection with our development of an IC product. As a result of the reimbursement, our overall research and development expense was reduced by $3.5 million in 2012. There were no reductions to research and development expense related to co-development arrangements in 2011 and 2010.

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 rely on a combination of nondisclosure agreements and patent, copyright, trademark and trade secret laws to protect the algorithms, design and architecture of our technology. Currently, we hold 120 patents and have 31 patent applications pending, which 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 5 to 16 years remaining in their respective term, depending on their filing and issuance 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 to the same extent as do the laws of the United States and, thus, make the possibility of piracy of our technology and products more likely in these countries.

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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 7: 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, 2012, we had a total of 233 employees compared to 242 employees as of December 31, 2011. We consider our relations with our employees to be good.

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 free of charge as soon as reasonably practicable after we electronically file such material with the Securities and Exchange Commission. 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.

Item 1A. Risk Factors.

Investing in our shares of common stock involves a high degree of risk, and investors should carefully consider the risks described below before making an investment decision. If any of the following risks occur, the market price of our shares of common stock could decline and investors could lose all or part of their investment. Additional risks that we currently believe are immaterial may also impair our business operations. In assessing these risks, 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, 2012, including our consolidated financial statements and related notes, and our other filings made from time to time with the Securities and Exchange Commission.

Company Specific Risks

Our product strategy, which is targeted at markets demanding superior video and image quality, may not lead to new design wins or 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 pixel processing and delivering high levels of video and image quality. With this strategy, we continue to make further investments in the development of our ImageProcessor architecture for the digital projector market, with particular focus on adding increased performance and functionality. For the advanced television 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 large-screen, high-resolution, high-quality segment of the television market. 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.

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 advanced television and digital projection markets.

We may fail to retain or attract the specialized technical and management personnel required to successfully operate our business.

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.

We have significantly less 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 future restructuring plans, which 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 restructuring plans, particularly if we are unable to generate 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. If we are unable to successfully introduce new or enhanced products, our sales and financial condition will be adversely affected.

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

Although we recorded net income as recently as the year ended December 31, 2010, we have incurred operating losses since 2004. 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 to our investors that we will ever achieve profitability. 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 50%, 53% and 44% of revenue for the years ended December 31, 2012, 2011, and 2010, respectively. Revenue attributable to our top five end customers represented 53%, 51% and 58% of revenue for the years ended December 31, 2012, 2011, and 2010, respectively. As of December 31, 2012, we had three accounts that each represented 10% or more of accounts receivable. As of December 31, 2011, we had two accounts that each represented 10% or more of accounts receivable. All of the orders included in our backlog are 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 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 may not be able to borrow funds under our credit facility or secure future financing.

In December 2010, we entered into a Loan and Security Agreement with Silicon Valley Bank (the "Loan and Security Agreement") to provide a secured, working capital-based, revolving line of credit. In December 2012, we entered into Amendment No. 1 to that Loan and Security Agreement (the "Amendment"). Among other things, the Amendment revises the calculation of the borrowing base under the Loan and Security Agreement to $1.0 million plus 80% of eligible domestic accounts receivable. The Amendment also provides an option for LIBOR advances that bear interest based on the LIBOR rate. We view this line of credit as a source of available liquidity to fund fluctuations in our working capital requirements. For example, 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 in the future when we may need to borrow funds under this facility. In addition, this facility expires on December 14, 2014, 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, or financing on terms that are acceptable to us.

Part of our business involves licensing our intellectual property, a strategy that increases business risk and volatility.

We have licensed certain of our intellectual properties to third parties and may seek to 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 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. Because of its high margin, our licensing revenue can have a disproportionate impact on gross profit and profitability. 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 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. The accounting rules associated with recognizing revenue from these transactions are complex and subject to interpretation. Due to these factors, the amount of license revenue recognized in any period may differ significantly from our expectations.

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

As of December 31, 2012, we had federal and state net operating loss carryforwards of approximately $187 million and $32.8 million, respectively, which expire between 2013 and 2032. 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% point 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.

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

Almost all of our customers are located in Japan, the People’s Republic of China ("PRC"), Korea, or Taiwan. Sales outside the U.S. accounted for approximately 90% of revenue for the year ended December 31, 2012 and 96%