UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K

(Mark One)

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

For the fiscal year ended December 28, 2019

or

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

For the transition period from to

Commission file number 001-33170

NETLIST, INC.

(Exact name of registrant as specified in its charter)

Delaware	**95-4812784**
State or other jurisdiction of incorporation or organization	(I.R.S. employer Identification No.)

175 Technology Drive, Suite 150
Irvine, CA 92618

(Address of principal executive offices) (Zip Code)

(949) 435-0025

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.001 per share	**NLST**	**None**

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

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

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

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

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

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

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

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

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

The aggregate market value of voting and non-voting common equity held by non-affiliates as of June 29, 2019, the last business day of the registrant's most recently completed second fiscal quarter, was approximately $42.1 million.[(A)]

(A)Excludes 10.5 million shares of common stock held by directors, executive officers and persons whose beneficial ownership exceeds ten percent of the shares outstanding at June 29, 2019. Exclusion of shares held by any person should not be construed to indicate that such person possesses the power, directly or indirectly, to direct or cause the direction of the management or policies of the registrant, or that such person is controlled by or under common control with the registrant.

As of March 3, 2020, there were 169,500,899 outstanding shares of the registrant's common stock.

DOCUMENTS INCORPORATED BY REFERENCE

None.

Netlist EX2108
Samsung v. Netlist
IPR2025-01431

NETLIST, INC. AND SUBSIDIARIES

Form 10-K
For the Fiscal Year Ended December 28, 2019
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CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This report includes "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are statements other than historical facts and often address future events or our future performance. Words such as "anticipate," "estimate," "expect," "project," "intend," "may," "will," "might," "plan," "predict," "believe," "should," "could" and similar words or expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

Forward-looking statements contained in this report include statements about, among other things:

- *our beliefs regarding the market and demand for our products or the component products we resell;*
- *our ability to develop and launch new products that are attractive to the market and stimulate customer demand for these products;*
- *our plans relating to our intellectual property, including our goals of monetizing, licensing, expanding and defending our patent portfolio;*
- *our expectations and strategies regarding outstanding legal proceedings and patent reexaminations relating to our intellectual property portfolio, including our pending proceedings against SK hynix Inc., a South Korean memory semiconductor supplier ("SK hynix");*
- *our expectations with respect to any strategic partnerships or other similar relationships we may pursue;*
- *the competitive landscape of our industry;*
- *general market, economic and political conditions;*
- *our business strategies and objectives;*
- *our expectations regarding our future operations and financial position, including revenues, costs and prospects, and our liquidity and capital resources, including cash flows, sufficiency of cash resources, efforts to reduce expenses and the potential for future financings; and*
- *the impact of the above factors and other future events on the market price and trading volume of our common stock.*

All forward-looking statements reflect management's present assumptions, expectations and beliefs regarding future events and are subject to known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those expressed in or implied by any forward-looking statements. These risks, uncertainties and other factors include those described in Item 1A. Risk Factors of this Form 10-K. In addition, we operate in a competitive and rapidly evolving industry in which new risks emerge from time to time, and it is not possible for us to predict all of the risks we may face, nor can we assess the impact of all factors on our business or the extent to which any factor or combination of factors could cause actual results to differ from our expectations. In light of these risks, uncertainties and other factors, our forward-looking statements should not be relied on as predictions of future events. All forward-looking statements reflect our assumptions, expectations and beliefs only as of the date they are made, and except as required by law, we undertake no obligation to revise or update any forward-looking statements for any reason.

We qualify all of our forward-looking statements by this cautionary note.

* * * * *

Unless the context indicates otherwise, all references to "Netlist," our "Company," "we," "us," or "our" in this report refer to Netlist, Inc., together with its consolidated subsidiaries, and all cross-references to notes in this Form 10-K refer to the identified note contained in our consolidated financial statements included in Part IV, Item 15 of this Form 10-K. We own registered or unregistered trademark rights to NVvault®, HyperCloud®, HybriDIMM™, EXPRESSvault™, PreSight™, "memory at storage capacities, storage at memory speeds"™, Netlist® and our company logo. Although we do not use the "®" or "™" symbol in each instance in which one of our registered or common law trademarks appears in this report, this should not be construed as any indication that we will not assert our rights thereto to the fullest extent under applicable law. Any other service marks, trademarks or trade names appearing in this report are the property of their respective owners.

PART I

Item 1. Business

Overview

We provide high-performance modular memory subsystems to customers in diverse industries that require enterprise and storage class memory solutions to empower critical business decisions. We have a history of introducing disruptive new products, such as one of the first load reduced dual in-line memory modules ("LRDIMM") based on our distributed buffer architecture, which has been adopted by the industry for DDR4 LRDIMM. We were also one of the first to bring NAND flash memory ("NAND flash") to the memory channel with our NVvault non-volatile dual in-line memory modules ("NVDIMM") using software-intensive controllers and merging dynamic random access memory integrated circuits (“DRAM ICs” or "DRAM") and NAND flash to solve data bottleneck and data retention challenges encountered in high-performance computing environments. We also offer storage class memory products called HybriDIMM to address the growing need for real-time analytics in Big Data applications, in-memory databases, high performance computing and advanced data storage solutions.

Due to the ground-breaking product development of our engineering teams, we have built a robust portfolio of over 130 issued and pending U.S. and foreign patents, many seminal, in the areas of hybrid memory, storage class memory, rank multiplication and load reduction. Since our inception, we have dedicated substantial resources to the development, protection and enforcement of technology innovations we believe are essential to our business. Our early pioneering work in these areas has been broadly adopted in industry-standard registered dual in-line memory modules (“RDIMM”), LRDIMM and NVDIMM. Our objective is to continue to innovate in our field and invest further in our intellectual property portfolio, with the goal of monetizing our intellectual property through a combination of product sales and licensing, royalty or other revenue-producing arrangements, which may result from joint development or similar partnerships or defense of our patents through enforcement actions against parties we believe are infringing them.

We also resell solid state drive (“SSD”), NAND flash, DRAM products and other component products to end-customers that are not reached in the distribution models of the component manufacturers, including storage customers, appliance customers, system builders and cloud and datacenter customers.

Our Industry

The global high-performance memory module market is driven by increasing demand from data center and enterprise storage applications for improved input/output performance, lower latency and data retention capabilities in the event of unexpected system failure. The proliferation of mobile devices, social media platforms, cognitive/artificial intelligence systems and cloud-based software applications is resulting in the creation of unprecedented amounts of unstructured data. In order to manage and analyze this data, we believe new computing and memory architectures need to be developed to satisfy the needs in the industry.

In high-performance computing environments, such as cloud-based computing and Big Data applications, a system's overall processing speed is limited to the ability of the central processing unit ("CPU") to access data cached in memory. Memory speeds have failed to keep pace with improvements in CPU processing speeds, resulting in buffering delays encountered in highly intensive computing environments. To mitigate challenges arising from differences in CPU and memory clock speeds, data center operators have increased the number of servers in their facilities as well as the memory content in each server. Memory capacity is expanded through the use of DIMMs, generally incorporating up to 16 GB of DRAM per module with today’s technology and moving up to 64/128 GB of DRAM per module and beyond. Our technology enables an intelligent controller to be integrated onto the DIMM, in order to manage the rapid flow of data between the CPU and memory. The number of DIMMs incorporated into a server increases in correlation with the number of processing cores in the CPU. DDR4 DIMMs incorporate our load-reduction technology to mitigate the trade-off between operating speed and memory capacity inherent in prior generations of server DIMM. These load-reduced DIMMs, or LRDIMMs, are now the predominant memory technology used in high-capacity servers and high-performance computing clusters.

Technical challenges arising from the production of DRAM using leading edge semiconductor manufacturing processes is limiting the material's long-term viability as the high-speed memory of choice in demanding computing environments. Conversely, NAND flash, while characterized by lower access speeds, is scaling down in cost and scaling up in density at a significantly better rate than DRAM. This has led the industry to explore alternative computer architectures and new memory materials capable of bridging DRAM's superior access speed with NAND flash's lower cost and higher densities. We expect memory subsystems relying on intelligent controller technology to leverage NAND flash will most effectively address the industry's growing need for high-speed data management and analytics.

Technology

Our portfolio of proprietary technologies and design techniques includes:

HybriDIMM Technology

HybriDIMM technology is, we believe, a breakthrough that allows for data that lives on a slower media, such as NAND flash, to coexist on the memory channel without breaking the deterministic nature of the memory channel. A proprietary software protocol controls the movement of data between DRAM and NAND flash on the DIMM while maintaining the integrity of the memory channel. HybriDIMM technology is material and protocol agnostic, allowing for leverage of future storage and memory technologies on the DIMM.

In developing this technology, we partnered with Samsung Electronics Co., Ltd. (“Samsung”) in November 2015 through a joint development and license agreement (“JDLA”) to jointly develop new storage class memory technologies, including a standardized product interface for NVDIMM-P memory modules, in order to facilitate broad industry adoption of this new technology.

Distributed Buffer Architecture

We invented the distributed buffer architecture that enables the buffering of data signals along the bottom edge of the memory module using multiple data buffer devices distributed between the edge connector and the DRAM. The result is shorter data paths, improved signal integrity, and reduced latency compared to the industry-standard design for DDR3 LRDIMM. The memory industry has widely adopted our distributed architecture for DDR4 LRDIMM. Our HyperCloud product was our first LRDIMM product built on this distributed buffer architecture.

Design Expertise

We have designed special algorithms that can be implemented in stand-alone integrated circuits or integrated into other functional blocks in application-specific integrated circuits (“ASICs”). We utilize these algorithms in our HybriDIMM product to incorporate load reduction functionality. We also incorporate these algorithms in our NVvault product line, which is also known in the industry as NVDIMM-N.

Proprietary PCB Designs

We utilize advanced techniques to optimize electronic signal strength and integrity within a printed circuit board (“PCB”). These techniques include the use of 10-layer or 12-layer boards, matching conductive trace lengths, a minimized number of conductive connectors, or vias, and precise load balancing to, among other benefits, help reduce noise and crosstalk between adjacent traces. In addition, our proprietary designs for the precise placement of intra-substrate components allow us to assemble memory subsystems with significantly smaller physical size, enabling original equipment manufacturers (“OEMs”) to develop products with smaller footprints for their customers.

Very Low Profile Designs

We believe we were the first company to create memory subsystems in a form factor of less than one inch in height. Our innovative very low profile (“VLP”) DIMMs provide developers of server blades, storage bridge bay applications, telecommunications servers, switches and routers with a wide range of high performance memory options

where efficient use of motherboard space is critical. Our technology has allowed us to decrease the system board space required for memory, and improve thermal performance and operating speeds, by enabling our customers to use alternative methods of component layout.

Thermal Management Designs

We design our memory subsystems to ensure effective heat dissipation. We use thermal simulation and data to obtain thermal profiles of the memory subsystem during the design phase, allowing us to rearrange components to enhance thermal characteristics and, if necessary, replace components that do not meet specifications. We also develop and use proprietary heat spreaders to enhance the thermal management characteristics of our memory subsystems.

Products

Our commercially available memory subsystem products and other products that we sell include:

Component and Other Product Resales

Due to our relationships with memory channel customers, in addition to our own products, we resell certain component products that we purchase for the purpose of resale. We have purchased certain of these products, including SSDs, NAND flash and DRAM products, from Samsung under the terms of the JDLA. We have also sourced these products from other suppliers to the extent sufficient product is not available from Samsung to meet customer demand or in the event of other Samsung supply issues. In 2019 and 2018, resales of these products represented approximately 77% and 75% of our net product sales, respectively. Additionally, we sell excess component inventory to distributors and other users of memory integrated circuits.

Storage Class Memory

Using an industry standard DDR4 LRDIMM interface, we believe HybriDIMM is the industry's first storage class memory product capable of operating in existing Intel x86 servers without BIOS and hardware changes. HybriDIMM unifies DRAM and NAND flash in a plug-and-play module, delivering terabyte storage capacities operating at DRAM-like nanosecond memory speeds. HybriDIMM's architecture combines an on-DIMM co-processor with our software-defined data management algorithm. HybriDIMM's feature set encompasses the NVDIMM functionalities adopted by the industry. HybriDIMM dramatically improves application performance by reducing data access latency by up to 1,000 times versus the fastest existing storage solution known to us.

We are now working with certain customers to transition to volume production. In July 2019, we entered into a non-binding Memorandum of Understanding (the "MOU") with Xi'an UniIC Semiconductors Co., Ltd. ("UniIC") to grant a non-exclusive license to UniIC to develop, market and sell a Media Controller ASIC (the "MCA") and a Hybrid DIMM Memory Module (the "HDIMM") based on HybriDIMM technology for a per unit royalty and our right to purchase MCAs from UniIC. Pursuant to the MOU, we would also obtain the right to build and sell HDIMMs based on the MCA and the right to develop and sell derivative MCA and HDIMM products based on the HybriDIMM Technology for a royalty amount to be negotiated.

Nonvolatile Memory

Our Vault product line enables customers to accelerate data running through their servers and storage and reliably protect enterprise-level cache, metadata and log data by providing near instantaneous recovery in the event of a system failure or power outage. Our nonvolatile memory offering includes:

NVvault DDR4 NVDIMM ("NV4"). NV4 is an NVDIMM-N that provides data acceleration and protection in a JEDEC standard DDR4 interface. It is designed to be integrated into industry standard server or storage solutions.

Specialty DIMMs and Embedded Flash

A small portion of our net product sales is from OEM sales of specialty memory modules and flash-based products, the majority of which are utilized in data center and industrial applications. When developing custom modules for an OEM system launch, we engage with our OEM customers from the earliest stages of new product development definition, providing us valuable insight into their full range of system architecture and performance requirements. This close collaboration has also allowed us to develop a significant level of systems expertise. We leverage a portfolio of proprietary technologies and design techniques, including efficient planar design, alternative packaging techniques and custom semiconductor logic, to deliver memory subsystems with persistence, high density, small form factor, high signal integrity, attractive thermal characteristics, reduced power consumption and low cost per bit.

Intellectual Property

We believe the strength of our intellectual property rights will be important to the success of our business. We utilize patent and trade secret protection, confidentiality agreements with customers and partners, disclosure and invention assignment agreements with employees and consultants and other contractual provisions to protect our technologies and other proprietary information. As of December 28, 2019, we had 103 U.S. and foreign issued patents and 29 pending U.S and foreign patent applications. Assuming they are properly maintained and are not invalidated by reexamination proceedings, our patents will expire at various dates between 2022 and 2035. Our issued patents cover various aspects of our innovations and include various claim scopes and, as a result, we believe our business is not materially dependent on any one claim in any of our existing patents or pending patent applications.

We have devoted significant resources to develop and enforce our intellectual property portfolio. For instance, we have taken action to protect and defend our innovations by filing legal proceedings for patent infringement against SK hynix and two of its subsidiaries in the U.S. International Trade Commission ("ITC"), U.S. district court and the courts of Germany and the People's Republic of China ("PRC"). In our two separate ITC actions, we have requested exclusion orders that direct U.S. Customs and Border Protection to stop allegedly infringing SK hynix RDIMM and LRDIMM products from entering the United States. Although our first ITC action has been resolved with a final determination of no infringement of the patents asserted in this action, our second ITC action, which relates to different patents, remains ongoing. In our U.S. district court and international court proceedings, we are primarily seeking damages. All of our patents involved in these proceedings cover key features of RDIMM and LRDIMM products.

Customers

We resell certain component products that we purchase for the purpose of resale to certain end-customers that are not reached in the distribution models of the component manufacturers, including storage customers, appliance customers, system builders and cloud and datacenter customers. We also market and sell our memory subsystem products, primarily to OEMs in the server, high-performance computing and communications markets.

Our target markets are characterized by a limited number of large companies, and consolidation in one or more of our target markets may further increase this concentration. As a result, sales to small numbers of customers have historically represented a substantial portion of our net product sales. Additionally, the composition of major customers and their respective contributions to our net product sales have fluctuated and will likely continue to fluctuate from period to period as our existing and prospective customers progress through the life cycle of the products they produce and sell and experience resulting fluctuations in their product demand. For further information about our customer concentrations, see Note 12 "Major Customers, Suppliers and Products" to our consolidated financial statements in Part IV, Item 15 of this Form 10-K.

We do not have long-term agreements with any of our customers. Instead, our product sales are made primarily pursuant to stand-alone purchase orders that we often receive no more than two weeks in advance of the desired delivery date and that may be rescheduled or cancelled on relatively short notice, which reduces our backlog of firm orders. Customers are generally allowed limited rights of return for up to 30 days, except for sales of excess inventories, which contain no right-of-return privileges.

Additionally, we offer warranties on our memory subsystems generally ranging from one to three years, depending on the product and negotiated terms of purchase orders from our customers. These warranties require us to repair or replace defective products returned to us during such warranty period at no cost to the customer.

Sales and Marketing

We primarily market and sell our products and the component products we resell through a direct sales force and a network of independent sales representatives. Our sales activities focus primarily on developing strong relationships at the technical, marketing and executive management levels within existing and prospective customers in our target markets.

We utilize well-trained, highly technical program management teams to drive new product development and quickly respond to our customers' needs and expectations. Our program management teams provide quick response times and act as a single point-of-contact for customer's issues that may arise during the sales process. Additionally, they help us address the long-term business and technology goals of our customers. We employ a team approach to business development whereby our sales team and independent representatives identify, qualify and prioritize customer prospects through offices in a number of locations worldwide.

Manufacturing and Supply

Manufacturing

We manufacture memory subsystem products at our facility in the PRC, which is certified in International Organization for Standardization ("ISO") 9001:2008 Quality Management Systems and ISO 14001:2004 Environmental Management Standards. Our in-house manufacturing function, combined with our engineering and design capabilities, allows us to assemble our memory subsystems quickly and in high volume. Our manufacturing facility is capable of surface mount assembly, subsystem testing, system-level burn-in testing, programming, marking, labeling and packaging. Manufacturing cycle times for our memory subsystem products, from receipt of order, are typically one week or less and in some cases as short as two days.

We schedule production based on purchase order commitments and anticipated orders. We release raw materials to the manufacturing floor by means of an online shop floor control system, which allows for internal quality analysis, direct access to inventory information and production floor material tracking. We have a flexible manufacturing workforce, which allows us to manage unforecasted demand.

We perform ongoing reliability testing on our memory subsystems and share the results of that testing with our customers. In addition, we have implemented procedures that require all of our memory subsystems to undergo functional and system burn-in testing prior to delivery to a customer. We also supplement our test capabilities with advanced imaging technology to inspect the quality of our assemblies.

Supply

We acquire components and materials, such as field-programmable gate arrays ("FPGAs"), ASICs, DRAM ICs and NAND flash, directly from integrated circuit manufacturers and assemble them into our finished subsystem products. We also purchase some of these component products from Samsung under the terms of the JDLA, and from alternative suppliers, for the purpose of resale to customers directly.

We have developed supplier relationships with several manufacturers of these component products, and we typically qualify our memory subsystem products with our customers using multiple component manufacturers. However, our actual purchases of component products, both for integration into our products and for resale, are concentrated in a small number of suppliers, including an affiliate of Samsung, from which we obtained 37% and 13% of our total inventory purchases in 2019 and 2018, respectively, Techtronics (Singapore) Pte, Ltd from which we obtained 17% of our total inventory purchases in 2019, and Memorysolution GmbH and EG Electronics from which we obtained 17% and 15% of our total inventory purchases in 2018, respectively. For further information about our supplier

concentrations, see Note 12 “Major Customers, Suppliers and Products” to our consolidated financial statements in Part IV, Item 15 of this Form 10-K.

We order component products based primarily on forecasts of customer demand, which subjects us to certain inventory risks in the event our forecasts are not accurate. In order to mitigate these inventory risks, we seek to resell to distributors and other users of memory integrated circuits excess quantities of the component inventories we have purchased for integration in our memory subsystem products.

Our quality assurance engineers work with our suppliers to ensure that the raw materials we receive meet our quality standards. These engineers also perform on-site supplier factory audits and use our internal test and inspection systems to verify that purchased components and materials meet our specifications. Our supplier quality program and incoming material quality control program are important aspects of our manufacturing and sale processes.

Competition

Our products are primarily targeted to OEMs in the server, high-performance computing and communications markets. In addition, we resell certain component products to storage customers, appliance customers, system builders and cloud and datacenter customers. These markets are intensely competitive, as numerous companies vie for business opportunities at a limited number of large OEMs and other customers. We face competition from DRAM suppliers, memory module providers and logic suppliers for many of our products, including NVvault and HybriDIMM. Additionally, if and to the extent we enter new markets or pursue licensing arrangements to monetize our technologies and intellectual property portfolio, we may face competition from a large number of competitors that produce solutions utilizing similar or competing technologies.

Some of our customers and suppliers may have proprietary products or technologies that are competitive with our products or the components we resell to them, or could develop internal solutions or enter into strategic relationships with, or acquire, other high-density memory module or component providers. Any of these actions could reduce our customers’ demand for our products or the component products we resell. Additionally, some of our significant suppliers could choose to sell component products to customers directly, which would adversely affect our ability to resell these products, or may be choose to manufacture competitive memory subsystem products themselves or reduce our supply of essential components of our products, which could adversely affect our ability to manufacture and sell our memory subsystems.

We believe the principal competitive factors in the selection of memory subsystems or the component products we resell by existing and potential future customers are:

- price;
- timeliness of new value-add product introductions;
- development of advanced technologies;
- fulfillment capability and flexibility;
- understanding of system and business requirements;
- design characteristics and performance;
- quality and reliability;
- track record of volume delivery; and
- credibility with the customer

We believe we compete favorably with respect to these factors. However, our target markets could disagree, or circumstances could change with respect to one or more of these competitive factors. Further, we believe our ability to compete in our current target markets and potential future markets will depend in part on our ability to successfully and timely develop, introduce and sell at attractive prices new and enhanced products or technologies and otherwise respond to changing market requirements, which we may not be able to do faster and better than our competitors. Moreover, many of our competitors have substantially greater financial, technical, marketing, distribution and other resources, broader product lines, lower cost structures, greater brand recognition, more influence on industry standards, more extensive or established patent portfolios and longer standing relationships with customers and suppliers. We may not be

able to compete effectively against any of these organizations. If we are unable to compete effectively, then our market position and prospects could deteriorate and our revenues could decline.

Research and Development

Our industry is characterized by rapid technological change, evolving industry standards and rapid product obsolescence. As a result, continuous development of new technology, processes and product innovation is necessary in order to be successful. We believe the continued and timely development of new products and improvement of existing products are critical to our business and prospects for growth.

To this end, we have assembled a team of engineers with expertise in computer architectures, system memory, subsystem design and memory software, as well as PCB design, VLP design and thermal management. Our engineers also focus on developing and incorporating new techniques, methodologies and processes for testing and manufacturing our products, and also collaborate with our customers to provide us with insights into and expertise in systems architecture, power budget, performance requirements, operating environment (such as air flow and operating temperature) and any mechanical constraints.

We have invested significant resources in our product research and development efforts. Our customers typically do not separately compensate us for design and engineering work involved in developing application-specific products for them.

Employees

As of December 28, 2019, we had 80 employees (including 63 full-time employees and 17 temporary employees). In addition to our employees, a significant portion of our workforce consists of contract personnel. We are not party to any collective bargaining agreements with any of our employees. We have never experienced a work stoppage, and we believe our employee relations are good.

Compliance with Environmental and Other Laws

We are subject to various and frequently changing U.S. federal, state and local and foreign laws and regulations relating to the protection of the environment, including laws governing the discharge of pollutants into the air and water, the management and disposal of hazardous substances and wastes and the clean-up of contaminated sites. In particular, some of our manufacturing processes may require us to handle and dispose of hazardous materials from time to time. For example, in the past our manufacturing operations have used lead-based solder in the assembly of our products. Today, we use lead-free soldering technologies in our manufacturing processes, as this is required for products entering the European Union. We could incur substantial costs, including clean-up costs, civil or criminal fines or sanctions and third-party claims for property damage or personal injury, as a result of violations of or noncompliance with these and other environmental laws and regulations. Although we have not incurred significant costs to date to comply with these laws and regulations, new laws or changes to current laws and regulations to make them more stringent could require us to incur significant costs to remain in compliance.

We also may be subject to a variety of laws and regulations relating to other matters, including workplace health and safety, labor and employment, foreign business practices (including the U.S. Foreign Corrupt Practices Act and applicable foreign anti-bribery laws), data protection, public reporting and taxation, among others. It is difficult and costly to manage the requirements of every authority having jurisdiction over our various activities and to comply with their varying standards. Any changes to existing regulations or adoption of new regulations may result in significant additional expense to us or our customers. Further, our failure to comply with any applicable laws and regulations may result in a variety of administrative, civil and criminal enforcement measures, including monetary penalties or imposition of sanctions or other corrective requirements.

General Information

We were incorporated in Delaware in June 2000 and commenced operations in September 2000. Our principal executive offices are located at 175 Technology Drive, Suite 150, Irvine, California 92618 and our telephone number at that address is (949) 435-0025. Our corporate website address is *www.netlist.com*.

We file reports with the Securities and Exchange Commission ("SEC") and make available, free of charge, on or through our website, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy and information statements and amendments to these reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. All SEC filings are also available at the SEC's website at *www.sec.gov*. Our website also contains copies of our corporate governance guidelines, code of business conduct and ethics, insider trading policy and whistleblower policy, as well as copies of the charters for our Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee.

Item 1A. Risk Factors

Investing in our securities involves a high degree of risk. Before making any investment decision with respect to our securities, you should carefully consider each of the following risk factors and the other information in this report. Each of these risk factors, either alone or together, could adversely affect our business, operating results, financial condition, ability to access capital resources and future growth prospects, as well as the value of an investment in our securities. As a result, you could lose some or all of any investment you have made or may make in our securities. In assessing these risks, you should also review the other information contained in this report, including our consolidated financial statements and accompanying notes, and the other filings we make with the SEC. The risks described below are not the only ones we face. Additional risks of which we are not presently aware or that we currently believe are immaterial may also impair our business operations and financial position.

Risks Related to Our Common Stock

The price and trading volume of our common stock has and may continue to fluctuate significantly.

Our common stock has been publicly traded since November 2006. The price and trading volume of our common stock are volatile and have in the past fluctuated significantly. This volatility could continue, in which case an active trading market in our common stock may not be sustained and stockholders may not be able to sell their shares at a desired time or a desired price.

The market price at which our common stock trades may be influenced by many factors, including, among others, the following:

- the results of legal proceedings in which we are involved;
- our operating and financial performance and prospects;
- investor perceptions of us and the industry in which we operate;
- our ability to meet investor and analyst expectations for our operating results;
- the availability and level of research coverage of and market-making in our common stock;
- changes in buy/sell recommendations by analysts;
- any financial projections we may provide to the public, any changes to these projections or our failure to meet these projections;
- our announcement of significant strategic transactions or relationships or the initiation of legal proceedings, including patent infringement actions;
- general political, economic and market conditions, including volatility or uncertainty in these conditions; and
- the other risk factors described in this report.

In addition, shares of our common stock and the public stock markets in general have experienced, and may continue to experience, extreme price and trading volume volatility, at times irrespective of the state of the business of any particular company. These fluctuations may adversely affect the market price of our common stock. Further, following periods of volatility in the overall market and the market price of a particular company's securities, securities litigation can sometimes be instituted against the company. Securities litigation, like other types of litigation, is expensive and time-consuming, and if such litigation is instituted against us in the future, we may incur substantial costs, management's attention and resources may be diverted, and we could be subject to damages in the event of unfavorable results.

There is a limited market for our common shares, and the trading price of our common shares is subject to volatility.

Netlist common shares began trading on the OTCQX in October 2018, following the decision to move trading of our common stock from The Nasdaq Capital Market. Because our stock is no longer listed on a registered national securities exchange, we are subject to certain "blue sky" laws of the various states which impose restrictions on our ability to offer and sell our securities. These "blue sky" laws may make it more difficult for us to raise capital or to issue our common stock for equity compensation or other strategic purposes, which could adversely affect our ability to fund our operations or to attract and retain employees. In addition, our stock may be defined as a "penny stock" under Rule 3a51-1 under the Exchange Act. "Penny stocks" are subject to Rule 15g-9, which imposes additional sales practice requirements on broker-dealers that sell low-priced securities to persons other than established customers and institutional accredited investors. For transactions covered by this rule, a broker-dealer must make a special suitability determination for the purchaser and have received the purchaser's written consent to the transaction prior to sale. Consequently, the rule may affect the ability of broker-dealers to sell our common stock and affect the ability of holders to sell their shares of our common stock in the secondary market. To the extent our common stock is subject to the penny stock regulations, the market liquidity for the shares will be adversely affected.

Future issuances of our common stock or rights to purchase our common stock, including pursuant to our equity incentive plans, could result in additional dilution to the percentage ownership of our stockholders and could cause the price of our common stock to decline.

We have historically funded our operations in large part with proceeds from equity and convertible debt financings, and we expect to continue to do so in the future. Future issuances of common stock may include sales of up to $20 million worth of shares of our common stock pursuant to our Purchase Agreement with Lincoln Park Capital Fund, LLC ("Lincoln Park"), entered into March 2020. In addition to capital-raising purposes, we may also issue securities from time to time at prices and on other terms as we determine for acquiring other businesses or assets in exchange for shares of our common stock or other securities, issuing securities to collaborators in connection with strategic partnerships, attracting and retaining employees with equity compensation, or other purposes. If we sell common stock or other equity or convertible debt securities in the future, our then-existing stockholders could be materially diluted by such issuances and new investors could gain rights, preferences and privileges senior to the holders of our common stock, which could cause the price of our common stock to decline.

Sales of our common stock, or the perception that such sales could occur, could cause the market price of our stock to drop significantly, regardless of the state of our business.

As of December 28, 2019, there were 169,538,399 shares of our common stock outstanding, of which 7,356,758 shares of our common stock are subject to outstanding stock options, 2,803,179 shares of our common stock are subject to outstanding unvested restricted stock units, 15,010,012 shares of our common stock are subject to outstanding warrants, and 12,986,302 shares of our common stock subject to an outstanding convertible note. All outstanding shares of our common stock are eligible for sale in the public market under applicable federal securities laws, subject in certain cases to the requirements of Rule 144 under the Securities Act of 1933, as amended (the "Securities Act"), and shares issued upon the exercise or conversion of outstanding stock options, warrants or convertible notes may also be eligible for sale in the public market, to the extent permitted by Rule 144 or other applicable securities laws and the provisions of the applicable stock option, warrant and convertible note agreements. If

these shares are sold, or if it is perceived that they may be sold, in the public market, the trading price of our common stock could fall.

Our principal stockholders have significant voting power and may take actions that may not be in the best interest of our other stockholders.

As of March 3, 2020, 5.9% of our outstanding common stock was held by our directors and officers, including 5.5% held by Chun K. Hong, our President, Chief Executive Officer and Chairman of our board of directors. As a result, Mr. Hong has the ability to exert substantial influence over all matters requiring approval by our stockholders, including the election and removal of directors, any proposed merger, consolidation or sale of all or substantially all of our assets and other significant corporate transactions. This concentration of control could be disadvantageous to other stockholders with interests different from those of Mr. Hong.

Anti-takeover provisions under our charter documents and Delaware law, as well as our rights agreement, could delay or prevent a change of control and could also limit the market price of our common stock.

Our certificate of incorporation and bylaws contain provisions that could delay or prevent a change of control of our Company or changes in our board of directors that our stockholders might consider favorable, including:

- our board of directors is authorized, without prior stockholder approval, to designate and issue preferred stock, commonly referred to as “blank check” preferred stock, which may have rights senior to those of our common stock;
- stockholder action by written consent is prohibited;
- nominations for election to our board of directors and the submission of matters to be acted upon by stockholders at a meeting are subject to advance notice requirements; and
- our board of directors is expressly authorized to make, alter or repeal our bylaws.

In addition, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which may prohibit certain business combinations with stockholders owning 15% or more of our outstanding voting stock. Further, in April 2017, we adopted a rights agreement that would, under certain specified circumstances and for so long as the rights issued under the rights agreement are outstanding, give the holders of our common stock the right to acquire additional shares of our capital stock, which would make it more difficult for a third party to acquire a significant percentage of our outstanding capital stock or attempt a hostile takeover of our Company.

These and other provisions in our certificate of incorporation and bylaws and of Delaware law, as well as the existence of our rights agreement, could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by our board of directors, including a merger, tender offer, proxy contest or other change of control transaction involving our Company. Any delay or prevention of a change of control transaction or changes in our board of directors could prevent the consummation of a transaction in which our stockholders could receive a substantial premium over the then-current market price for our common stock. In addition, these anti-takeover provisions could reduce the price that investors are willing to pay for shares of our common stock.

We do not currently intend to pay dividends on our common stock, and any return to investors is expected to result, if at all, only from potential increases in the price of our common stock.

We intend to use all available funds to finance our operations. Accordingly, while all decisions about dividends are at the discretion of our board of directors, we have never declared or paid cash dividends on our capital stock in the past, and we have no intention of declaring or paying any such dividends in the foreseeable future. As a result, any return to investors is expected to result, if at all, only from potential increases in the price of our common stock.

Risks Related to Our Business

We have historically incurred losses and may continue to incur losses.

Since the inception of our business in 2000, we have only experienced one fiscal year (2006) with profitable results. In order to regain profitability, or to achieve and sustain positive cash flows from operations, we must reduce operating expenses and/or increase our revenues and gross margins. Although we have in the past engaged in a series of cost reduction actions, such expense reductions alone will not make us profitable or allow us to sustain profitability if it is achieved, and eliminating or reducing strategic initiatives could limit our opportunities and prospects. Our ability to achieve profitability will depend on increased revenue growth from, among other things, increased demand for our memory subsystems and other product offerings and our ability to monetize our intellectual property. We may not be successful in any of these pursuits, and we may never achieve profitability or sustain profitability if achieved.

Our results of operations fluctuate significantly and are difficult to predict.

Our operating results have fluctuated significantly in the past, and we expect they will continue to fluctuate from period to period due to a variety of factors, many of which are beyond our control. Factors relating to our business that may contribute to these fluctuations include, among others, the amount and timing of sales of products, the prices we charge for products, changes in product mix, customer mix or other similar factors, the rate and timing of our billing and collections cycles and the timing and amount of our commitments and other payments, as well as the other risk factors described in this report. In addition, our results may be impacted by events that do not recur regularly, in the same amounts or at all in other periods, including events that may result in our incurrence of cash or non-cash charges or gains in certain periods.

These fluctuations in our operating results may render period-to-period comparisons less meaningful, and investors should not rely on the results of any one period as an indicator of future performance. Moreover, these fluctuations in our operating results could cause our performance in any particular period to fall below the expectations of investors or securities analysts or any guidance we have provided to the public, which could negatively affect the trading price of our common stock.

We may not have sufficient working capital to fund our planned operations, and, as a result, we may need to raise additional capital in the future, which may not be available when needed, on acceptable terms or at all.

To support our activities in the near term, we expect to rely on cash generated from our business and proceeds from issuances of debt and equity securities, including our equity line with Lincoln Park, and borrowing availability under our credit facility with Silicon Valley Bank ("SVB"). Taking into account our planned activities and sources of capital, we believe we have sufficient cash resources to satisfy our capital needs for at least the next 12 months. However, our estimates of our operating revenues and expenses and working capital requirements could be incorrect, and we may use our cash resources faster than we anticipate. Further, some or all of our ongoing or planned investments may not be successful and could further deplete our capital without immediate, or any, cash returns.

Our capital requirements will depend on many factors, including, among others:

- the costs associated with maintaining, defending and enforcing our intellectual property rights;
- the acceptance of, and demand for, our products and the component products we resell to customers;
- our success, and that of our strategic partners, in developing and selling products derived from our technology;
- the extent and timing of any investments in developing, marketing and launching new or enhanced products or technologies;
- the costs of developing, improving and maintaining our internal design, testing and manufacturing processes;
- our results of operations, including our levels of net product sales and any other revenues we may receive, including non-recurring engineering ("NRE"), license, royalty or other fees;

- the amount and timing of vendor payments and the collection of receivables, among other factors affecting our working capital;
- our receipt of cash proceeds from the exercise of outstanding stock options or warrants to acquire our common stock;
- the nature and timing of acquisitions or other strategic transactions or relationships in which we engage, if any; and
- the costs associated with the continued operation, and any future growth, of our business.

Until we can generate sufficient revenues to finance our cash requirements from our operations, which we may never do, we may need to increase our liquidity and capital resources by one or more measures, which may include, among others, reducing operating expenses, restructuring our balance sheet by negotiating with creditors and vendors, entering into strategic partnerships or alliances, raising additional financing through the issuance of debt, equity or convertible securities or pursuing alternative sources of capital, such as through asset or technology sales or licenses or other alternative financing arrangements. Further, even if our near-term liquidity expectations prove correct, we may still seek to raise capital through one or more of these financing alternatives. However, we may not be able to obtain capital when needed or desired, on terms acceptable to us or at all.

Inadequate working capital would have a material adverse effect on our business and operations and could cause us to fail to execute our business plan, fail to take advantage of future opportunities or fail to respond to competitive pressures or customer requirements. A lack of sufficient funding may also require us to significantly modify our business model and/or reduce or cease our operations, which could include implementing cost-cutting measures or delaying, scaling back or eliminating some or all of our ongoing and planned investments in corporate infrastructure, research and development projects, legal proceedings, business development initiatives and sales and marketing activities, among other activities. Modification of our business model and operations could result in an impairment of assets, the effects of which cannot be determined. Furthermore, if we continue to issue equity or convertible debt securities to raise additional funds, our existing stockholders may experience significant dilution, and the new equity or debt securities may have rights, preferences and privileges that are superior to those of our existing stockholders. Additionally, because our common stock is no longer listed on The Nasdaq Capital Market, the challenges and risks of equity financings may significantly increase, including potentially increasing the dilution of any such financing or decreasing our ability to effect such a financing at all. If we incur additional debt, it may increase our leverage relative to our earnings or to our equity capitalization or have other material consequences. If we pursue asset or technology sales or licenses or other alternative financing arrangements to obtain additional capital, our operational capacity may be limited and any revenue streams or business plans that are dependent on the sold or licensed assets may be reduced or eliminated. Moreover, we may incur substantial costs in pursuing any future capital-raising transactions, including investment banking, legal and accounting fees, printing and distribution expenses and other similar costs, which would reduce the benefit of the capital received from the transaction.

We may be unsuccessful in monetizing our intellectual property portfolio.

We dedicate substantial resources to developing technology innovations we believe are essential to our business. We intend to pursue monetization avenues for our intellectual property portfolio, potentially including licensing, royalty or other revenue-producing arrangements. However, we have not generated any such revenue stream from our intellectual property to date, and we may never be successful in achieving this objective.

Although we may pursue agreements with third parties to commercially license certain of our products or technologies, we may never successfully enter into any such agreement. Further, the terms of any such agreements we may reach with third-party licensees are uncertain and may not provide sufficient royalty or other licensing revenues to us to justify our costs of developing and maintaining the licensed intellectual property or may otherwise include terms that are not favorable to us. Additionally, the pursuit of licensing arrangements would require by its nature that we relinquish certain of our rights to our technologies and intellectual property that we license to third parties, which could limit our ability to base our own products on such technologies or could reduce the economic value we receive from such technologies and intellectual property. Additionally, the establishment of arrangements to monetize our intellectual property may be more difficult or costly than expected, may require additional personnel and investments and may be a significant distraction for management.

Our ability to establish licensing, royalty or similar revenues, and maintain or increase any such revenues we are able to establish, depends on a variety of factors, including, among others, the novelty, utility, performance, quality, breadth, depth and overall perceived value of our intellectual property portfolio, all as compared to that of our competitors, as well as our sales and marketing capabilities. Even if we are able to secure these revenues, they may be negatively affected by factors that are entirely or partially outside our control, including reductions in our customers' sales prices, sales volumes and the general state of their business, as well as the terms of the license arrangements.

If we are not successful in monetizing our intellectual property portfolio, we may never recoup our investments of time, capital and other resources in the development, maintenance, defense and enforcement of this portfolio, which could materially harm our financial condition and prospects.

We have incurred a material amount of indebtedness to fund our operations, the terms of which have required us to pledge substantially all of our assets as security. Our level of indebtedness and the terms of such indebtedness could adversely affect our operations and liquidity.

We have incurred debt under our convertible note issued to Samsung Venture Investment Co. ("SVIC"), our credit facility with SVB, and our funding arrangement with TR Global Funding V, LLC, an affiliate of TRGP Capital Management ("TRGP"). In connection with these debt and other arrangements, we have granted security interests to SVIC, SVB and TRGP in our various assets, such that all of our tangible and intangible assets, including our complete patent portfolio, are subject to one or more outstanding liens held by one or more of these parties.

The SVIC and SVB debt instruments and the TRGP investment agreement contain customary representations, warranties and indemnification provisions, as well as affirmative and negative covenants that, among other things, restrict our ability to:

- incur additional indebtedness or guarantees;
- incur liens;
- make investments, loans and acquisitions;
- consolidate or merge;
- sell or exclusively license assets, including capital stock of subsidiaries;
- alter our business;
- change any provision of our organizational documents;
- engage in transactions with affiliates;
- make certain decisions regarding certain of our outstanding legal proceedings without consulting with or obtaining consent from certain of these parties; and
- pay dividends or make distributions.

The SVIC and SVB debt instruments and the TRGP investment agreement also include events of default, including, among other things, payment defaults, any breach by us of representations, warranties or covenants, certain bankruptcy events and certain material adverse changes. If an event of default were to occur under any of these instruments or agreements and we were unable to obtain a waiver for the default, the counterparties could, among other remedies, accelerate our obligations under the debt instrument or other agreement and exercise their rights to foreclose on their security interests, which would cause substantial harm to our business and prospects.

Additionally, incurrence and maintenance of this or other debt could have material adverse consequences on our business and financial condition, such as:

- requiring us to dedicate a portion of our cash flows from operations and other capital resources to debt service, thereby reducing our ability to fund working capital, capital expenditures and other cash requirements;
- increasing our vulnerability to adverse economic and industry conditions;

- limiting our flexibility in planning for or reacting to changes and opportunities in our business and industry, which may place us at a competitive disadvantage; and
- limiting our ability to incur additional debt when needed, on acceptable terms or at all.

We are and expect to continue to be involved in legal proceedings at the ITC to try to stop allegedly infringing SK hynix RDIMM and LRDIMM products from entering the United States, as well as legal proceedings in U.S. and international courts to seek damages for the alleged patent infringement. Our involvement in these proceedings, as well as steps we have taken to implement certain of our strategies in connection with these proceedings, subject us to a number of risks.

We have taken action to protect and defend our innovations by filing legal proceedings for patent infringement against SK hynix, Inc., a South Korean memory semiconductor supplier ("SK hynix") and two of its subsidiaries in the U.S. International Trade Commission ("ITC"), U.S. district court and the courts of Germany and the People's Republic of China (the "PRC"). In our two separate ITC actions, we have requested exclusion orders that direct U.S. Customs and Border Protection to stop allegedly infringing SK hynix registered dual in-line memory modules ("RDIMM") and load reduced dual in-line memory modules ("LRDIMM") products from entering the United States. In our U.S. district court and international court proceedings, we are primarily seeking damages.

Our first ITC action was resolved in January 2018 with a final determination of no infringement of the patents asserted in this action. The Company appealed this final determination to the Court of Appeals for the Federal Circuit where on December 12, 2019, the CAFC dismissed our appeal as moot. In our second ITC action, the ITC terminated the investigation in April 2018, but then restarted the investigation in May 2018 following a Remand order from the ITC Commission and it remains ongoing. Although our U.S. and international court proceedings remain ongoing, the loss of the first ITC action could negatively impact our prospects for positive results in these other proceedings. Moreover, if we do not achieve a positive result in the second ITC action, then we will have invested significant time and funds in the first and second ITC actions that will not be recovered with any cash returns.

On January 31, 2019, the Munich District Court (the "Court") dismissed an action brought by us against SK hynix Inc. and Hewlett-Packard GmbH regarding the infringement of our German utility model. In its judgment the Court followed a different claim construction than advocated by us whereby it did not find our utility model to be infringed.

Our remaining proceedings against SK hynix, as with any intellectual property litigation, are expensive and time-consuming, regardless of the merits of the claims, and could divert management's attention from our other activities. Even if we are successful at the ITC, we would then need to enforce the order, which could also be expensive, time-consuming and a diversion to management. In addition, lawsuits in the ITC and in courts are subject to inherent uncertainties due to the complexity of the technical issues involved and various other factors, and we may not be successful in any of our actions. For example, if we are countersued by SK hynix and lose the suit, we could be required to pay substantial damages or lose some of our intellectual property protections. Furthermore, we may not be able to reach a settlement with SK hynix to license our patent portfolio, and even if we are able to reach a settlement, the terms of the arrangement may not be as favorable as we anticipated. Any of the foregoing could cause us to incur significant costs, decrease the perceived value of our intellectual property and materially adversely affect our business, financial condition or results of operations.

We have taken steps intended to solidify our position and strategy in connection with our proceedings against SK hynix. In May 2017, we established a funding arrangement with TRGP, which generally provides that TRGP will directly fund the costs incurred by us or on our behalf in connection with certain of our SK hynix proceedings (including our first ITC action and our U.S. district court proceedings, but excluding our second ITC action and our proceedings in international courts), and in exchange for such funding, we agreed to pay to TRGP the amount of its funding plus an escalating premium if and when we recover any proceeds from the funded proceedings, and we have granted to TRGP a first-priority lien on the claims underlying the funded proceedings and any proceeds received from the funded proceedings and a second-priority lien on our patents that are the subject of the funded proceedings. We established this funding arrangement in order to provide us with increased security that we will be able to vigorously pursue our claims against SK hynix through their final resolution, but the arrangement also involves certain risks, including, among others,

our obligation to use a portion of any proceeds we may receive from these proceedings to repay the funded amounts at a premium. On January 29, 2020, Netlist, Inc. TRGP entered into a First Amendment to the funding arrangement with TRGP. Under the First Amendment, the parties agreed to modify the recovery sharing formula related to claims against SK hynix. Our arrangement with TRGP only covers fees incurred in connection with certain of our outstanding proceedings against SK hynix, and we are responsible for funding costs related to our other outstanding proceedings and any future actions we may file. As a result, our ability to fund all of our proceedings against SK hynix may be limited to our own cash resources, in which case we may be forced to severely limit our pursuit of these claims and/or our other operations.

In addition, in April 2017, we adopted a rights agreement to implement a standard "poison pill." In general terms, for so long as the rights issued under the rights agreement are outstanding, the rights agreement prevents any person or group from acquiring a significant percentage of our outstanding capital stock or attempting a hostile takeover of our Company by significantly diluting the ownership percentage of such person or group. The rights agreement expires on the earlier of the complete resolution of all our proceedings against SK hynix or April 17, 2021. As a result, the rights agreement has a significant anti-takeover effect. Our board of directors approved the rights agreement as part of our strategy in connection with our proceedings against SK hynix, with the intent of disconnecting our market capitalization from the damages calculations and any settlement negotiations that may develop in connection with these proceedings. However, the rights agreement may not have the intended, or any, impact on these proceedings or any related settlement negotiations, but would have the anti-takeover effect of any standard "poison pill" and thus would involve the risks associated with these anti-takeover effects, which are described elsewhere in these risk factors.

We are and expect to continue to be involved in other legal and administrative proceedings to enforce or protect our intellectual property rights and to defend against claims that we infringe the intellectual property rights of others.

As is common in the semiconductor industry, we have experienced substantial litigation regarding patent and other intellectual property rights. We are currently involved in litigation and proceedings at the U.S. Patent and Trademark Office ("USPTO") and Patent Trial and Appeal Board ("PTAB") based on alleged third-party infringement of our patents, and lawsuits claiming we are infringing others' intellectual property rights also have been and may in the future be brought against us.

Our business strategy includes litigating claims against others, such as our competitors and customers, to enforce our intellectual property, contractual and commercial rights, including, in particular, our patent portfolio and our trade secrets, as well as to challenge the validity and scope of the proprietary rights of others. This or other similar proceedings could also subject us to counterclaims or countersuits against us, or the parties we sue could seek to invalidate our patents or other intellectual property rights through reexamination or similar processes at the USPTO or similar bodies. Further, any legal disputes with customers could cause them to cease buying or using our products or the component products we resell or delay their purchase of these products and could substantially damage our relationship with them.

Moreover, our ability to continue to pursue this strategy depends on our ability to obtain and protect patents, which is governed by an uncertain process. In addition to the patent issuance process established by law and the procedures of the USPTO, we must also comply with administrative procedures of the Joint Electron Device Engineering Council ("JEDEC") to protect our intellectual property within its industry standard-setting process. These procedures evolve over time, are subject to variability in their application and may be inconsistent with each other. Any failure to comply with the USPTO's or JEDEC's administrative procedures could jeopardize our ability to claim that our patents have been infringed.

Making use of new technologies and entering new markets increases the likelihood that others might allege that our products or the component products we resell infringe their intellectual property rights. The likelihood of this type of lawsuit may also be increased due to the limited pool of experienced technical personnel that we can draw on to meet our hiring needs. As a result, a number of our existing employees have worked for our existing or potential competitors at some point during their careers, and we anticipate a number of our future employees will have similar work histories. Moreover, lawsuits of this type may be brought, even if there is no merit to the claim, as a strategy to prevent us from hiring qualified candidates, drain our financial resources and divert management's attention away from our business.

Litigation is inherently uncertain. An adverse outcome in existing or any future litigation could force us to, among other things:

- relinquish patents or other protections of our technologies if they are invalidated, which would enable our competitors and others to freely use this technology;
- compete with products that rely on technologies and other intellectual property rights that we believe we have the right to protect from third-party use;
- accept terms of an arrangement to license our technologies to a third party that are not as favorable as we might expect;
- receive little or no returns for our time and capital investments in the litigation;
- cease manufacturing and/or selling products or using certain processes that are claimed to be infringing a third party's intellectual property;
- pay damages (which in some instances may be three times actual damages), including royalties on past or future sales, if we are found to infringe a third party's intellectual property;
- seek a license from a third-party intellectual property owner to use its technology in our products or the component products we resell, which may not be available on reasonable terms or at all; or
- redesign any products that are claimed to be infringing a third party's intellectual property, which may not be possible to do in a timely manner, without incurring significant costs or at all.

Moreover, any litigation, regardless of its outcome, involves a significant dedication of resources, including time and capital, and diverts management's attention from our other activities. As a result, any current or future infringement claims or patent challenges by or against third parties, whether or not eventually decided in our favor or settled, could materially adversely affect our business, financial condition and results of operations. Additionally, the outcome of pending or future litigation and related patent reviews and reexaminations, as well as any delay in their resolution, could affect our ability to continue to sell our products, protect against competition in the current and expected markets for our products or license or otherwise monetize our intellectual property rights in the future.

The vast majority of our revenues in recent periods have been generated from resales of component products, including products sourced from Samsung, and any decline in these product resales could significantly harm our performance.

The vast majority of our revenues in recent periods have been generated from resales of component products, including SSDs, NAND flash and DRAM products. We resell these component products to end-customers that are not reached in the distribution models of the component manufacturers, including storage customers, appliance customers, system builders and cloud and datacenter customers.

These component product resales are subject to a number of risks. For example, demand for these products could decline at any time for a number of reasons, including, among others, changing customer requirements or preferences, product obsolescence, introduction of more advanced or otherwise superior competing products by our competitors, the ability of our customers to obtain these products or substitute products from alternate sources (including from the manufacturer directly), customers reducing their need for these products generally, or the other risk factors described in this report. We have no long-term agreements or other commitments with respect to sales of these or any of the other products we sell. As a result, any decrease in demand for these products from us would reduce our sale levels and could materially adversely impact our revenues. Additionally, opportunistic purchases of products for resale, when coupled a decrease in demand, may cause us to write off excess inventory which would adversely affect our operating performance.

We may experience supply shortages at any time and for a variety of reasons, including, among others, spikes in customer demand that cannot be satisfied, any problems that arise with Samsung's manufacturing operations or facilities that cause disruptions or delays, or any failure to comply with the terms of the JDLA regarding the supply of these products. If we choose, or if we are forced, to seek to supply the component products we resell from other suppliers, we may not be able to identify other suppliers that are available and able to produce the particular components

with the specific product specifications and in the quantities our customers require, or we may not be able to make arrangements with any other suppliers in a timely manner to avoid delays in satisfying customer orders. Further, even if we are able to make arrangements with other suppliers for sufficient component products to replace any undersupply from Samsung, we may not be able to make these arrangements on financial and other terms comparable to those we have negotiated with Samsung under the JDLA. As a result, any inability to obtain sufficient component products from Samsung could increase our cost of sales for component product resales if we are forced to pay higher prices to obtain the products from other suppliers. Moreover, all of our supply arrangements for these component products, including the terms of the JDLA and any arrangements we may establish with other suppliers, are subject to the other supply and manufacturing risks discussed elsewhere in these risk factors.

Increased reliance on product resales also has a substantial impact on our results of operations. Because the cost of the component products we purchase for resale is added to our cost of sales for these products, our gross margin on resales of component products is significantly lower than our gross margin on sales of our own memory subsystem products. As a result, increased resales of component products as a percentage of our total product sales have a significant negative impact on our gross margin and gross profit. This gross margin and gross profit differential between memory product sales and component product resales would be amplified if our costs to purchase component products were to increase.

The occurrence of any one or more of these risks could cause our performance to materially suffer.

We are subject to risks relating to our focus on developing our HybriDIMM and NVvault products for our target customer markets.

We have historically derived revenues from sales of our high-performance modular memory subsystems to original equipment manufacturers ("OEMs") in the server, high-performance computing and communications markets. Although we expect these memory subsystems to continue to account for a portion of our revenues, we have experienced declines in sales of these products in recent periods, and these declines could continue or intensify in the future. We believe market acceptance of these products or derivative products that incorporate our core memory subsystem technology is critical to our success, and any continued decline in sales of these products could have a material adverse impact on our performance and long-term prospects.

We have invested significant research and development time and capital in the design of ASIC and hybrid devices, including our NVvault family of products and our next-generation HybriDIMM memory subsystem. These products are subject to significant risks, including:

- we are dependent on a limited number of suppliers for the SSDs, DRAM ICs, NAND flash and ASIC devices that are essential to the functionality of these products, and in the past, we have experienced supply chain disruptions and shortages of SSDs, DRAM and NAND flash required to create these products as a result of issues that are specific to our suppliers or the industry as a whole;
- HybriDIMM and some of our other next-generation products may require additional time including the services and attention of key employees who have competing demands on their available time and may require capital investment to bring the products to market;
- our development and commercialization strategies for these products;
- we are required to demonstrate the quality and reliability of our products to and qualify them with our customers before purchases are made, which requires investments of time and resources in significant and unpredictable amounts prior to the receipt of any revenues from these customers; and
- our NVvault products or other new products, such as HybriDIMM, may contain currently undiscovered flaws, the correction of which could result in increased costs and time to market.

These and other risks associated with our memory subsystem products could impair our ability to obtain customer or market acceptance of these products or obtain such acceptance in a timely manner, which would reduce our achievable revenues from these products and limit our ability to recoup our investments in developing these technologies.

Additionally, if the demand for servers deteriorates, if the demand for our products to be incorporated in servers continues to decline, or if demand for our products deteriorates because customers in our other target markets change their requirements or preferences or otherwise reduce their need for these types of products generally, our operating results would be adversely affected, and we would be forced to diversify our product portfolio and our target customer markets in order to try to replace revenues lost from the further decreases in product sales. We may not be able to achieve this diversification, and any inability to do so may adversely affect our business, operating performance and prospects.

Sales to a small number of customers have historically represented a significant portion of our net product sales, and the loss of, or a significant reduction in sales to, any one of these customers could materially harm our business.

Our target markets are characterized by a limited number of large companies, and consolidation in one or more of these markets may further increase this concentration. As a result, sales to small numbers of customers have historically represented a substantial portion of our net product sales, and we expect this concentration to continue. Additionally, the composition of major customers and their respective contributions to our net product sales have fluctuated and will likely continue to fluctuate from period to period as our existing and prospective customers progress through the life cycle of the products they produce and sell and experience resulting fluctuations in their product demand. We believe our performance depends in significant part on our ability to establish and maintain relationships with and effect substantial sales to our large customers.

We do not have long-term agreements with any of our customers and, as result, any or all of them could decide at any time to decrease, delay or discontinue their purchase of our products or the component products we resell. In addition, the prices customers pay for products are subject to fluctuations, and large or key customers may exert pressure on us to make concessions in the prices at which we sell products to them. Further, we may not be able to sell some of our products developed for one customer to a different customer because our products are often customized to address specific customer requirements, and even if we are able to sell these products to another customer, our margin on these products may be reduced. Additionally, although customers are generally allowed only limited rights of return after purchasing our products or the component products we resell, we may determine that it is in our best interest to accept returns from certain large or key customers even if we are not contractually obligated to accept them in order to maintain good relations with these customers. Any returns beyond our expectations could negatively impact our operating results. Moreover, because a few customers often account for a substantial portion of our net product sales, the failure of any one of these customers to pay on a timely basis would negatively impact our cash flows. As a result, our net product sales and operating results could be materially adversely affected by the loss of any of our customers, particularly our large or key customers, a decrease in product sales to any of our customers, including as a result of normal fluctuations in demand or other factors, reductions in the prices at which we sell products to any of our customers, including as a result of price concessions or general declines in average sale prices, or difficulties collecting payments from any of our customers.

Our ability to maintain or increase our product sales to our key customers depends on a variety of factors, many of which are beyond our control. These factors include our customers' continued sales of servers and other computing systems that incorporate our memory subsystems, our customers' continued incorporation of our products or the component products we resell into their systems, and our customers' sales activity and business results. Because of these and other factors, sales to these customers may not continue and the amount of such sales may not reach or exceed historical levels in any future period.

We are subject to risks of disruption in the supply of component products.

Our ability to fulfill customer orders for or produce qualification samples of our memory subsystem products, as well as orders for the component products we resell, is dependent on a sufficient supply of SSDs, FPGAs, ASICs, DRAM ICs and NAND flash, which are essential components of our memory subsystems. We have no long-term supply contracts for any of these component products. Further, there are a relatively small number of suppliers of these components, and we typically purchase from only a subset of these suppliers. As a result, our inventory purchases have historically been concentrated in a small number of suppliers, including an affiliate of Samsung, from which we obtained

a large portion of our component products purchased for resale and our total inventory purchases in 2017. We also use consumables and other components, including PCBs, to manufacture our memory subsystems, which we sometimes procure from single or limited sources to take advantage of volume pricing discounts.

From time to time, shortages in SSDs, DRAM ICs and NAND flash have required some suppliers to limit the supply of these components. In the past, we have experienced supply chain disruptions and shortages of SSDs, DRAM and NAND flash required to create certain of our memory subsystem products, and we have been forced to procure the component products we resell from other suppliers to the extent sufficient product is not available from Samsung to meet customer demand or in the event of other Samsung supply issues. We are continually working to secure adequate supplies of the components necessary to fill customers' orders in a timely manner. If we are unable to obtain a sufficient supply of SSDs, DRAM ICs, NAND flash or other essential components to avoid interruptions or failures in the delivery of our products as required by our customers or the delivery of these components to customers to whom we resell them directly, these customers may reduce future orders for these products or not purchase these products from us at all, which could cause our net product sales to decline and harm our operating results. In addition, our reputation could be harmed due to failures to meet our customers' demands and, even assuming we are successful in resolving supply chain disruptions, we may not be able to replace any lost business and we may lose market share to our competitors. Further, if our suppliers are unable to produce qualification samples of our products on a timely basis or at all, we could experience delays in the qualification process with existing or prospective customers, which could have a significant impact on our ability to sell our products. Moreover, if we are not able to obtain these components in the amounts needed on a timely basis and at commercially reasonable prices, we may not be able to develop or introduce new products, we may experience significant increases in our cost of sales if we are forced to procure components from alternative suppliers and are not able to negotiate favorable terms with these suppliers, or we may be forced to cease our sales of products dependent on the components or resales of the components we sell to customers directly.

Our dependence on a small number of suppliers and the lack of any guaranteed sources for the essential components of our products and the components we resell expose us to several risks, including the inability to obtain an adequate supply of these components, increases in their costs, delivery delays and poor quality. Additionally, our customers qualify certain of the components provided by our suppliers for use in their systems. If one of our suppliers experiences quality control or other problems, it may be disqualified by one or more of our customers. This would disrupt our supplies of these components, and would also reduce the number of suppliers available to us and may require that we qualify a new supplier, which we may not be able to do.

Declines in customer demand for our products in recent periods have caused us to reduce our purchases of SSDs, DRAM ICs and NAND flash for use as components in our products. Such declines or other fluctuations could continue in the future. If we fail to maintain sufficient purchase levels with some suppliers, our ability to obtain supplies of these raw materials may be impaired due to the practice of some suppliers of allocating their products to customers with the highest regular demand.

Frequent technology changes and the introduction of next-generation versions of component products may also result in the obsolescence of our inventory on-hand, which could involve significant time and costs to replace, reduce our net product sales and gross margin and adversely affect our operating performance and financial condition.

Our customers require that our products undergo a lengthy and expensive qualification process without any assurance of sales.

Our prospective customers generally test and evaluate our memory subsystems before purchasing our products and integrating them into their systems. This extensive qualification process involves rigorous reliability testing and evaluation of our products, which may continue for nine months or longer and is often subject to delays. In addition to qualification of specific products, some of our customers may also require us to undergo a technology qualification if our product designs incorporate innovative technologies that the customer has not previously encountered. Such technology qualifications often take substantially longer than product qualifications and can take over a year to complete. Even after our products are qualified with existing or new customers, the customer may take several months to begin purchasing the product or may decide not to purchase the product at all, as qualification does not ensure product sales. As a result, we

could receive no or limited revenues from a customer even after our investment of time and resources in the qualification process with this customer, which could adversely affect our operating results.

Even after successful qualification and sales of our products to a customer, because the qualification process is both product-specific and platform-specific, our existing customers sometimes require us to re-qualify our products or to qualify our new products for use in new platforms or applications. For example, as our OEM customers transition from prior generation architectures to current generation architectures, we must design and qualify new products for use by these customers. Our net product sales to these customers can decline significantly during this re-qualification process.

Likewise, changes in our products, our manufacturing facilities, our production processes or our component suppliers may require a new qualification process. For example, if our memory, SSDs, NAND flash and DRAM component suppliers discontinue production of these components, it may be necessary for us to design and qualify new products for our customers. As a result, some customers may require us, or we may decide, to purchase an estimated quantity of discontinued memory components necessary to ensure a steady supply of existing products until products with new components can be qualified. Purchases of this nature may affect our liquidity. Additionally, our forecasts of quantities required during the transition may be incorrect, which could adversely impact our results of operations through lost revenue opportunities or charges related to excess and obsolete inventory.

We must devote substantial resources, including design, engineering, sales, marketing and management efforts, to qualify our products with prospective customers in anticipation of sales. Significant delays or other difficulties in the qualification process could result in an inability to keep pace with rapid technology change or new competitive products. If we experience delays or do not succeed in qualifying a product with an existing or prospective customer, we would not be able to sell that product to that customer, which may result in excess and obsolete inventory that we may not be able to sell to another customer and could reduce our net product sales and customer base, any of which could materially harm our operating results and business.

If we are unable to timely and cost-effectively develop new or enhanced products that achieve customer and market acceptance or technologies we can monetize, our revenues and prospects could be materially harmed.

Our industry is characterized by rapid technological change, evolving industry standards and rapid product obsolescence. As a result, continuous development of new technology, processes and product innovations is necessary in order to be successful. We believe the continued and timely development of new products and technologies and improvement of existing products and technologies are critical to our business and prospects for growth.

In order to develop and introduce new or enhanced products and technologies, we need to:

- retain and continue to attract new engineers with expertise in memory subsystems and our key technology competencies;
- identify and adjust to the changing requirements and preferences of our existing and potential future customers and markets;
- identify and adapt to emerging technological trends and evolving industry standards in our markets;
- continue to develop and enhance our design tools, manufacturing processes and other technologies on which we rely to produce new products or product enhancements;
- design and introduce cost-effective, innovative and performance-enhancing features that differentiate our products and technologies from those of our competitors;
- secure licenses to enable us to use any technologies, processes or other rights essential to the manufacture or use of any new products or product enhancements we may develop, which licenses may not be available when needed, on acceptable terms or at all;
- maintain or develop new relationships with suppliers of components required for any new or enhanced products and technologies;
- qualify any new or enhanced products for use in our customers' products; and
- develop and maintain effective commercialization and marketing strategies.

We may not be successful at any of these activities. As a result, we may not be able to successfully develop new or enhanced products or technology or we may experience delays in this process. Failures or delays in product development and introduction could result in the loss of, or delays in generating, net products sales or other revenues and the loss of key customer relationships. Even if we develop new or enhanced products or technologies, they may not meet our customers' requirements, gain market acceptance or attract monetization opportunities, as our product and technology development efforts are inherently risky due to the challenges of foreseeing changes or developments in technology, predicting changes in customer requirements or preferences or anticipating the adoption of new industry standards. Moreover, we have invested significant resources in our product and technology development efforts, which would be lost if we fail to generate revenues from these efforts. If any if these risks occur, our revenues, prospects and reputation could be materially adversely affected.

We face intense competition in our industry, and we may not be able to compete successfully in our target markets.

Our products are primarily targeted to OEMs in the server, high-performance computing and communications markets. In addition, we resell certain component products to storage customers, appliance customers, system builders and cloud and datacenter customers. These markets are intensely competitive, as numerous companies vie for business opportunities at a limited number of large OEMs and other customers. We face competition from DRAM suppliers, memory module providers and logic suppliers for many of our products, including NVvault and HybriDIMM. We also face competition from the manufacturers and distributors of the component products we resell to customers, as these manufacturers and distributors could decide at any time to sell these component products to these customers directly. Additionally, if and to the extent we enter new markets or pursue licensing arrangements to monetize our technologies and intellectual property portfolio, we may face competition from a large number of competitors that produce solutions utilizing similar or competing technologies.

Some of our customers and suppliers may have proprietary products or technologies that are competitive with our products or the components we resell to them or could develop internal solutions or enter into strategic relationships with, or acquire, other high-density memory module or component providers. Any of these actions could reduce our customers' demand for our products or the component products we resell. Additionally, some of our significant suppliers could choose to sell component products to customers directly, which would adversely affect our ability to resell these products, or may choose to manufacture competitive memory subsystem products themselves or reduce our supply of essential components of our products, which could adversely affect our ability to manufacture and sell our memory subsystems.

We believe our ability to compete in our current target markets and potential future markets will depend in part on our ability to successfully and timely develop, introduce and sell at attractive prices new and enhanced products or technologies and otherwise respond to changing market requirements, which we may not be able to do faster and better than our competitors. Moreover, many of our competitors have substantially greater financial, technical, marketing, distribution and other resources, broader product lines, lower cost structures, greater brand recognition, more influence on industry standards, more extensive or established patent portfolios and longer standing relationships with customers and suppliers. We may not be able to compete effectively against any of these organizations. If we are unable to compete effectively, then our market position and prospects could deteriorate and our revenues could decline.

If our proprietary rights are not protected, our customers or our competitors might gain access to our proprietary designs, processes and technologies, which could adversely affect our operating results.

We rely on a combination of patent protection, trade secret laws and restrictions on disclosure to protect our intellectual property and other proprietary rights. We have submitted a number of patent applications regarding our proprietary processes and technology, many of which have resulted in issued patents. For our pending patent applications, it is uncertain when or if any of the claims in these applications will be allowed or result in issued patents, in which case the technologies or processes sought to be patented would remain unprotected from use by third parties. In addition, although we intend to continue filing patent applications with respect to new processes and technologies we develop, patent protection may not be available for some of these processes or technologies. Further, even if we are successful in obtaining patent protection, these protections could be limited in scope by the USPTO, a court or applicable foreign authorities or challenged by third parties by way of review or reexamination proceedings and

subsequently invalidated, which would reduce the protections these patents are able to provide. Moreover, patent protection is limited as to duration and all of our issued patents will eventually expire, at which time the previously protected technologies would become widely available for use by third parties, including our competitors.

Despite our efforts to protect our intellectual property rights, these efforts may not:

- prevent challenges to or the invalidation or circumvention of our intellectual property rights;
- keep our competitors or other third parties from independently developing similar products or technologies, duplicating, reverse engineering or otherwise using our products or technologies without our authorization or designing around any patents that may be issued to us;
- prevent disputes with third parties regarding ownership of our intellectual property rights;
- prevent disclosure of our trade secrets and know-how to third parties or into the public domain;
- result in valid patents, including international patents, from any of our pending or future applications; or
- otherwise adequately protect our intellectual property rights.

Moreover, monitoring for any unauthorized use of our technologies is costly, time-consuming and difficult. This is particularly true in foreign countries, such as the PRC, where we have established a manufacturing facility and where the laws may not protect our proprietary rights to the same extent as applicable U.S. laws.

If some or all of the claims in our patent applications are not allowed, if any of our issued patents or other intellectual property protections are limited, invalidated or circumvented by third parties, or if we are not able to obtain extensions of existing patents upon their expiration or issuance of new patents to maintain protections provided by expiring patents, we could face increased competition for our products and technologies and be unable to execute on our strategy of monetizing our intellectual property. Any of these outcomes could significantly harm our business, operating results and prospects.

Our operating results may be adversely impacted by worldwide economic and political uncertainties and specific conditions in the markets we address and in which we or our strategic partners or competitors do business, including the cyclical nature of and volatility in the memory market and semiconductor industry.

Changes in domestic and global economic and political conditions make it difficult for our customers, our vendors and us to accurately forecast and plan future business activities, and these conditions have caused and could continue to cause U.S. and foreign businesses to slow or decrease spending on our products and the products we resell.

In addition, sales of our products and the products we resell are dependent on demand by customers in our target markets. These markets are characterized by wide fluctuations in product supply and demand and have been cyclical in the past, which may result in substantial period-to-period fluctuations in our operating results. In addition, these markets have in the past experienced significant downturns, often connected with or in anticipation of maturing product cycles, reductions in technology spending and declines in general economic conditions. During these downturns, product demand diminishes, production capacity exceeds demand, inventory levels increase and average sale prices decline, all of which would materially adversely impact our business and operating results. In addition, because many of our costs and operating expenses are relatively fixed, if we are unable to control our expenses adequately in response to reduced product demand and sales, our gross margins and cash flows would be negatively impacted. Further, such a downturn could decrease the perceived value of our intellectual property portfolio and reduce our ability to pursue our intellectual property monetization objectives.

During challenging economic times, our customers may face challenges gaining timely access to sufficient credit, which could impair their ability to make timely payments to us. This may negatively affect our liquidity and cash flows and require us to increase our allowance for doubtful accounts. Furthermore, our vendors may face similar issues gaining access to credit, which may limit their ability to supply components or provide trade credit to us.

We cannot predict the timing, strength or duration of any economic slowdown or subsequent economic recovery, either generally or in our customer markets. If the economy or markets in which we operate experience such a

slowdown, our business, financial condition and results of operations could be materially and adversely affected. The combination of our lengthy sales cycle coupled with any challenging macroeconomic conditions could compound the negative impact of any such downturn on the results of our operations.

Our lack of a significant backlog of unfilled orders and the difficulty inherent in estimating customer demand makes it difficult to forecast our short-term requirements, and any failure to optimally calibrate our production capacity and inventory levels to meet customer demand could adversely affect our revenues, gross margins and earnings.

We make significant decisions regarding the levels of business we will seek and accept, production schedules, component procurement, personnel needs and other resource requirements based on our estimates of customer demand. We do not have long-term agreements with any of our customers. Instead, our product sales are made primarily pursuant to stand-alone purchase orders that we often receive no more than two weeks in advance of the desired delivery date and that may be rescheduled or cancelled on relatively short notice. The short-term nature of the commitments by many of our customers and our customers' ability to cancel or defer purchase orders for any reason reduces our backlog of firm orders and our ability to accurately estimate future customer requirements for our products or the component products we resell. These facts, combined with the short turnaround times that apply to most orders, makes it difficult to predict our production and inventory needs and allocate production capacity and capital for inventory purchases effectively. As a result, we attempt to forecast the demand for the components needed to manufacture our products and to resell to customers directly, but any such forecasts could turn out to be wrong. Further, lead times for components vary significantly and depend on various factors, such as the specific supplier and the demand and supply for a component at any given time.

Our production expense and component purchase levels are to a large extent fixed in the short term. As a result, we may be unable to adjust spending on a timely basis to compensate for any unexpected shortfall in customer orders. If we overestimate customer demand, we may have excess component or finished goods inventory, which may not be able to be used in other products or resold and may become obsolete before any such use or resale. If there is a subsequent decline in the prices of components, the value of our inventory would fall and we may be required to write-down the value of our component inventory, which may result in a significant increase in our cost of sales and decrease in our gross margin. In the past, we have had to write-down inventory due to obsolescence, excess quantities and declines in market value below our costs. As a result, any significant shortfall of customer orders in relation to our expectations could hurt our operating results, cash flows and financial condition.

Conversely, any rapid increases in demand by our customers could strain our resources. If we underestimate customer demand, we may not have sufficient inventory of necessary components on hand to meet that demand and we may need to try to procure additional quantities, which may not be available or may only be available at high prices or on otherwise unfavorable terms. We also may not have sufficient manufacturing capacity at any given time to meet any demands for rapid increases in production of our memory subsystem products. Any shortages of inventory or manufacturing capacity could lead to delays in the delivery of products, which may force us to forego sales opportunities, reduce our net product sales and damage our customer relationships.

In addition, if our product demand forecasts are wrong, we may understate or overstate the provision required for excess and obsolete inventory. If our inventories are determined to be overvalued, we would be required to recognize additional expense in our cost of sales at the time of the determination. Conversely, if our inventories are determined to be undervalued, we may have over-reported our costs of sales in previous periods and would be required to recognize additional gross profit at the time the inventories are sold.

Declines in our average sale prices, driven by volatile prices for components and other factors, may result in declines in our revenues and gross profit.

Our industry has historically been characterized by declines in average sale prices. If sale price declines are not offset by corresponding decreases in costs or increases in sales volume or sales of products with higher margins, these sale price declines could have a material adverse effect on our operating results.

The prices customers pay for the products we sell can fluctuate due to many factors, including, among others, competitive conditions in our key customer markets, changes in customer requirements or preferences, volatility in the market prices for SSDs, DRAM ICs, NAND flash and other component products, and changes in manufacturing efficiencies or capacities. Market prices for component products have historically constituted a substantial portion of the total cost of our memory subsystems and in recent periods have constituted the vast majority of the cost of resales of these products to customers directly. As a result, fluctuations in the prices for these component products, due to overcapacity in worldwide supply or increased manufacturing efficiencies, implementation of new manufacturing processes or expansion of manufacturing capacity by component suppliers, among other factors, significantly impact our costs to sell our products or component products.

Once our prices with a customer are negotiated, we are generally unable to revise pricing with that customer until our next regularly scheduled price adjustment. As a result, if market prices for essential components increase, we generally cannot pass the price increases through to our customers for products purchased under an existing purchase order. Consequently, we are exposed to the risks associated with the volatility of prices for these components and our cost of sales could increase and our gross margins could decrease in the event of sudden price increases. Alternatively, if there are declines in the prices of these components, we may be required to reduce our selling prices for subsequent purchase orders, which may result in a decline in our net product sales.

Our manufacturing operations involve significant risks.

We maintain a manufacturing facility in the PRC at which we produce most of our products. These manufacturing activities require significant resources to maintain. For instance, we must continuously review and improve our manufacturing processes in order to maintain satisfactory manufacturing yields and product performance, try to lower our costs and otherwise remain competitive. As we manufacture new and more complex products, the risk of encountering delays, difficulties or higher costs increases. In addition, the start-up costs associated with implementing new manufacturing technologies, methods and processes, including the purchase of new equipment and any resulting manufacturing delays and inefficiencies, could negatively impact our results of operations.

Additionally, we could experience a prolonged disruption, material malfunction, interruption or other loss of operations at our manufacturing facility for any number of reasons, including the occurrence of a contagious disease or illness, such as the novel coronavirus, or catastrophic weather events, or we may need to add manufacturing capacity to satisfy any increased demand for our products. Under these circumstances, we may be forced to rely on third parties for our manufacturing needs, which could increase our manufacturing costs, decrease our gross margin, decrease our control over manufacturing processes, limit our ability to satisfy customer requirements and demand and delay new product development until we could secure a relationship with a third-party manufacturer, which we may not be able to do in a timely manner, on acceptable terms or at all. If any of these risks occur, our operations, performance and customer relationships could be severely harmed.

We also may need to expand our existing manufacturing facility or establish a new facility in the future. Any need to expand or replace our manufacturing facility would be expensive and time-consuming and could also subject us to factory audits by our customers that could themselves result in delays, unexpected costs or customer losses if we cannot meet the standards of any such audits. Further, we may not be able to replace or increase our manufacturing capacity at all. The occurrence of any of these events could have a material adverse effect on our business, financial condition and results of operations.

We depend on third parties to design and manufacture components for our products and the component products we resell, which exposes us to risks.

Components that are used in our products, as well as all of the component products we resell, are designed and manufactured by third parties. In addition, some of our memory subsystem products rely on significantly customized components. The ability and willingness of third parties to enter into these engagements with us and perform in accordance with these engagements is largely outside our control. If one or more of our design or manufacturing partners experiences a manufacturing disruption for any number of factors including labor disruptions, catastrophic weather events and the occurrence of a contagious disease or illness, such as the novel coronavirus, fails to dedicate adequate

resources to the production of the components we use in our products or the components we resell, experiences financial instability or otherwise fails to perform its obligations to us in a timely manner or at satisfactory quality levels, our ability to bring products to market or deliver products to our customers, as well as our reputation, could suffer and our business and prospects could be materially harmed. In the event of any failure by our component manufacturers, we may have no readily available alternative source of supply for these components, since, in our experience, the lead time needed to establish a relationship with a new design or manufacturing partner is substantial, and the time for our OEM customers to re-qualify our products with components from a new vendor is also significant. Additionally, even if an alternative manufacturer is available, we may not be able to engage the manufacturer on acceptable terms, which could result in increased costs, timing requirements or other adverse changes. Further, we may not be able to redesign the customized components used in our products to be manufactured by a new manufacturer, in which case we could infringe on the intellectual property of our current design or manufacturing partner when we manufacture the products with a new design or manufacturing partner. Such an occurrence could force us to stop selling certain of our products or could expose us to lawsuits, license payments or other liabilities.

Our dependence on third-party manufacturers exposes us to many other risks, including, among others: reduced control over delivery schedules, quality, manufacturing yields and costs; the potential lack of adequate capacity during periods of excess demand; limited warranties on products supplied to us; and potential infringement or misappropriation of our intellectual property or the intellectual property of others. We are dependent on our manufacturing partners to manufacture components with acceptable quality and manufacturing yields, to deliver these components to us on a timely basis and at an acceptable cost and to allocate a portion of their manufacturing capacity sufficient to meet our needs. However, these component manufacturers may not be able to achieve these tasks. Additionally, our manufacturing partners may not continue to devote adequate resources to produce our products or the component products we resell, or continue to advance the process design technologies on which the customer qualifications of our products are based. Any of these risks could limit our ability to meet customer demand and materially adversely affect our business and operating results.

If our products or the component products we resell do not meet quality standards or are defective or used in defective systems, we may be subject to quality holds, warranty claims, recalls or liability claims.

Our customers require our products and the component products we resell to meet strict quality standards. If the products fail to meet these standards, our customers may discontinue purchases from us until we are able to resolve the quality issues that are causing these failures, which we may not be able to do. These “quality holds” can be costly and time-consuming to resolve. In addition, if the products we sell are defectively manufactured, contain defective components or are used in defective or malfunctioning systems, we could be subject to warranty and product liability claims, product recalls, safety alerts or advisory notices.

Although we generally attempt to contractually limit our exposure to incidental and consequential damages, if these contract provisions are not enforced or if liabilities arise that are not effectively limited, we could incur substantial costs in defending or settling product liability claims. While we currently have product liability insurance, it may not provide coverage under certain circumstances and it may not be adequate to satisfy claims made against us. We also may be unable to maintain insurance in the future at satisfactory rates or in adequate amounts.

Warranty and product liability claims, product “quality holds,” product recalls, safety alerts or advisory notices, regardless of their coverage by insurance or their ultimate outcome, could have a material adverse effect on our business, performance and financial condition, as well as our ability to attract and retain customers.

If a standardized memory solution that addresses the demands of our customers is developed, our net product sales and market share may decline.

Many of our memory subsystems are specifically designed for our OEM customers’ high-performance systems. In a drive to reduce costs and assure supply of their memory module demand, our OEM customers may endeavor to design JEDEC standard DRAM modules into their new products. Although we also manufacture JEDEC modules, this trend could reduce the demand for our higher-priced customized memory solutions, which would have a negative impact on our operating results. In addition, the adoption of a JEDEC standard module instead of a previously custom module

might allow new competitors to participate in a share of our customers' memory module business that previously belonged to us.

If our OEM customers were to adopt JEDEC standard modules, our future business may be limited to identifying the next generation of high-performance memory demands of OEM customers and developing solutions that address these demands. Until fully implemented, any next generation of products may constitute a significantly smaller market, which could reduce our revenues and harm our competitive position.

We may become involved in non-patent related litigation and administrative proceedings that may materially adversely affect us.

From time to time, we may become involved in various legal proceedings relating to matters incidental to the ordinary course of our business, including commercial, employment, class action, whistleblower and other litigation and claims, as well as governmental and other regulatory investigations and proceedings. Such matters can be time-consuming, divert management's attention and resources and cause us to incur significant expenses. Furthermore, because litigation is inherently unpredictable, the results of these actions could subject us to monetary damages or other liabilities and have a material adverse effect on our business, results of operations and financial condition.

Our indemnification obligations for the infringement by our products of the rights of others could require us to pay substantial damages.

As is common in our industry, we have a number of agreements in which we have agreed to defend, indemnify and hold harmless our customers and suppliers from damages and costs that may arise from the infringement by our products of third-party patents, trademarks or other proprietary rights. The scope of these indemnities varies, the duration of these indemnities is generally perpetual after execution of an agreement, and the maximum potential amount of future payments we could be required to make under these indemnities is often unlimited. Any indemnification claims by customers could require us to incur significant legal fees and could potentially result in our payment of substantial damages, and our insurance generally would not cover these fees or damages. As a result, the occurrence of any of these risks could have a material adverse effect on our business and results of operations.

We depend on certain key employees, and our business could be harmed if we lose the services of any of these employees or are unable to attract and retain other qualified personnel.

To date, we have been highly dependent on the experience, relationships and technical knowledge of certain key employees. We believe our future success will be dependent on our ability to retain the services of these key employees, develop their successors and properly manage the transition of their roles should departures occur. The loss of these key employees or their inability to continue to provide their services could delay the development and introduction of new or enhanced products or technologies, negatively impact our ability to sell our existing products, limit our ability to pursue our other business goals and strategies and otherwise harm our business. We do not have employment agreements with any of our employees other than Chun K. Hong, our President, Chief Executive Officer and Chairman of our board of directors, and as a result most of our employees may terminate their employment with us at any time. We maintain "Key Man" life insurance on Mr. Hong, but we do not carry "Key Man" life insurance on any of our other employees.

Our future success also depends on our ability to attract, retain and motivate highly skilled engineering, manufacturing and other technical and sales personnel. Competition for these personnel is intense. We may not be successful in attracting new engineers or other technical personnel or in retaining or motivating our existing personnel. If we are unable to hire and retain personnel with the skills necessary to keep pace with the evolving technologies in our markets, our ability to continue to provide our existing products and to develop new or enhanced products and technologies would be negatively impacted, which could harm our business. In addition, a general shortage of experienced engineers or other technical personnel could lead to increased recruiting, relocation and compensation costs to attract new recruits, which may increase our operating expenses or make these hires more difficult or impossible if increased recruiting costs exceed our resources.

A significant portion of our workforce consists of contract personnel. We invest considerable time and expense to train these contract personnel; however, they typically may terminate their relationships with us at any time. As a result, we may experience high turnover rates in this contract personnel workforce, which may require us to expend additional resources to attract, train and retain replacements. Additionally, if we convert any of these contract personnel to permanent employees, we may have to pay finder's fees to the contract agency. These risks associated with our contract personnel workforce may involve increased costs or delays or failures in meeting customer requirements or developing new or enhanced products or technologies, any of which could materially adversely affect our business and operating performance.

We are also subject to employment laws and regulations, including the changing regulatory landscape. For example, in California, State Assembly Bill 5 ("AB5"), which went into effect in January 2020, codifies a test to determine whether a worker is an employee under California law. AB5 provides a mechanism for determining whether workers of a hiring entity are employees or independent contractors, but AB5 does not result in any immediate change in how workers are classified. If the State of California, cities or municipalities, or workers disagree with how a hiring entity classifies workers, AB5 sets forth the test for evaluating their classification. The legal and other costs associated with any misclassification of our personnel can be substantial and could materially adversely affect our results of operations and financial condition.

We rely on our internal and third-party sales representatives to market and sell our products and the component products we resell, and any failure by these representatives to perform as expected could reduce our sales.

We primarily market and sell our products and the component products we resell through a direct sales force and a network of independent sales representatives. We have expended significant resources to build our internal sales and marketing function, but compared to many of our competitors, we have relatively little experience creating a sales and marketing platform and developing a team to implement it. We may be unsuccessful in these efforts.

Our sales representatives generally may terminate their relationships with us at any time. As a result, our performance depends in part on our ability to retain existing and attract additional sales representatives that will be able to effectively market and support our products or the component products we resell, especially in markets in which we have not previously distributed these products. Our efforts to attract, train and retain these sales representatives to be knowledgeable about our industry, products and technologies are costly and time-consuming. If these efforts fail, our investments in these sales representatives may not produce the expected or any benefits and our ability to market and sell our products or the component products we resell may be limited, which could materially harm our financial condition and operating results. Further, our reliance on independent sales representatives subjects us to risks, as we have very little control over their activities and they are generally free to market and sell other, potentially competing, products. As a result, these independent sales representatives could devote insufficient time or resources to marketing our products or the component products we resell, could market them in an ineffective manner or could otherwise be unsuccessful in selling adequate quantities of these products.

We are exposed to additional business, regulatory, political, operational, financial and economic risks related to our international sales and operations.

We sell products to foreign corporations and deliver products to facilities located in foreign countries. To facilitate this process and to meet the long-term projected demand for our products, we have established a manufacturing facility in the PRC that performs most of the manufacturing activities for our memory subsystem products.

Selling and manufacturing in foreign countries subjects us to additional risks not present with our domestic operations, as we are operating in business and regulatory environments in which we have limited experience and that may impose materially different requirements. Further, the geographic distance from our headquarters in Irvine, California, compounds the difficulties of maintaining a manufacturing operation in the PRC. For instance, we may not be able to maintain the desired amount of control over production capacity and timing, inventory levels, product quality, delivery schedules, manufacturing yields or costs. Moreover, we will need to continue to overcome language and cultural barriers to effectively conduct these international operations. Failures in any of these areas could result in legal consequences or production delays and increased turnaround times, which could adversely affect our business. In

addition, changes to the labor or other laws of the PRC or the economic and political conditions in the PRC, including increased industrialization in recent years, natural disasters, public health crises, including the occurrence of a contagious disease or illness, such as the novel coronavirus, and other catastrophic events, could increase the costs of employing a local workforce or conducting our manufacturing operations in the PRC. Any of these factors could negatively impact any cost savings we experience from locating our manufacturing facility in the PRC. Additionally, our management has limited experience creating or overseeing foreign operations generally, and the ongoing administration and operation of our PRC facility may require substantial amounts of time and attention by our management team, particularly if we encounter operational, legal or cultural difficulties or disruptions at our PRC facility.

To date, all of our net product sales have been denominated in U.S. dollars. In the future, however, some of our net product sales may be denominated in Chinese Renminbi ("RMB"). The Chinese government controls the procedures by which RMB is converted into other currencies, which generally requires government consent. As a result, RMB may not be freely convertible into other currencies at all times. If the Chinese government institutes changes in currency conversion procedures or imposes additional restrictions on currency conversion, our operations and our operating results could be negatively impacted. In addition, Chinese law imposes restrictions on the movement of funds outside of the PRC. If we need or decide to repatriate funds from our Chinese operations, we would be required to comply with the procedures and regulations of applicable Chinese law, and any failure to so comply could adversely affect our liquidity and financial condition. Further, if we are able to repatriate funds from our Chinese operations, these funds would be subject to U.S. taxes. In addition, fluctuations in the exchange rate between RMB and U.S. dollars may adversely affect our expenses, the value of our assets and liabilities and the comparability of our period-to-period results.

Our international operations and sales are subject to a number of additional risks, including, among others, timing and availability of export licenses; difficulties in accounts receivable collections; difficulties managing distributors; lack of a significant local sales presence in a number of markets; difficulties obtaining government approvals; compliance with anti-bribery, data protection and other applicable U.S. and foreign laws, including the U.S. Foreign Corrupt Practices Act and similar anti-bribery laws in the non-U.S. jurisdictions in which we operate, as well as a wide variety of other complex foreign laws, regulations and treaties; and potentially adverse tax consequences. In addition, the United States or foreign countries may implement quotas, duties, tariffs, taxes or other charges or restrictions on the importation or exportation of our products or the component products we resell, which could lead to a reduction in sales and profitability in that country. This risk of increased trade barriers or charges has become more pronounced because the trade policies of the current U.S. presidential administration, including withdrawal from the Trans-Pacific Partnership, imposition of tariffs on Chinese goods and services and recent revisions to the North American Free Trade Agreement, could threaten or otherwise have a significant negative effect on our ability to continue to conduct our international operations in the same manner and at the same costs as we have in the past. The recent implementation of tariffs by the United States on goods manufactured in other countries, including PRC, could cause the costs of our products to increase, which could significantly impair the gross profit we receive and thereby harm our operating results significantly.

In addition, international turmoil and the threat of future terrorist attacks have contributed to an uncertain political and economic climate, both in the United States and globally, and have negatively impacted the worldwide economy. The economies of the PRC and other countries in which we make sales have been volatile in recent years, resulting in significant fluctuations in local currencies and other instabilities. These conditions could continue or worsen, which could adversely affect our foreign operations and our performance.

The occurrence of any of these risks related to our international operations, including our manufacturing facility in the PRC and our international sales, could have a material adverse effect on our business, financial condition and prospects for growth.

Our operations could be disrupted by power outages, natural disasters or other factors.

Due to the geographic concentration of our manufacturing operations in our PRC facility and our small number of component suppliers, including Samsung for many of the component products we resell, a disruption resulting from equipment or power failures, quality control issues, human errors, government intervention or natural disasters, including earthquakes and floods, could require significant costs to repair and could interrupt or interfere with product

manufacture and sale and cause significant delays in product shipments, which could harm our customer relationships, financial condition and results of operations. In the past, our PRC facility has suffered water damage as a result of heavy rains and floods, which forced us to temporarily halt manufacturing at the facility while necessary repairs or equipment replacements were made. This incident caused us to incur additional expenses because we were forced to shift our manufacturing activities to a third-party facility in the PRC to mitigate the disruption in product shipments to our customers. If manufacturing at the PRC facility is disrupted for similar or other reasons in the future, we may again be subject to increased expenses in order to engage a third-party manufacturer, or, if we are not able to secure alternative manufacturing capabilities, our ability to sell products and our relationships with our customers could be materially harmed. Additionally, we may be forced to bear significant costs in order to repair any damage to our manufacturing equipment and facility. Any of these outcomes could have a material adverse effect on our business and results of operations.

Difficulties with our global information technology systems, including any unauthorized access, could harm our business.

We store key data about our business, including certain customer data, information about our and our customer's intellectual property and other proprietary information, on our global information technology systems. Any failure or malfunctioning of our global information technology systems, errors or misuse by system users, difficulties migrating stand-alone systems to our centralized systems or inadequacy of the systems in addressing the needs of our operations could disrupt our ability to timely and accurately manufacture and ship products, divert management's and key employees' attention from other business matters and involve significant costs and other resources to repair or otherwise resolve, any of which could have a material adverse effect on our business, financial condition and results of operations. Any such event could also disrupt our ability to timely and accurately process, report and evaluate key operating metrics and key components of our results of operations, financial position and cash flows and could adversely affect our ability to complete other important business processes, such as maintenance of our disclosure controls and procedures and internal control over financial reporting.

While our information technology systems include security measures designed to prevent unauthorized access, employee error, employee malfeasance or other causes, including intentional misconduct by computer hackers, could circumvent these measures and result in unauthorized access to these systems. Because the techniques used to gain unauthorized access to information technology systems evolve frequently and often are not recognized until successful, we may be unable to anticipate these techniques or implement adequate preventative measures in a timely manner. Any security breach could require significant resources to correct, if correction is possible, and could result in disruption to our business, misappropriation or loss of data, loss of confidence in us by our customers, damage to our reputation and legal liability. Further, any failure to implement appropriate security measures to protect our information or any breach or other failure of our systems that results in unauthorized access, manipulation, disclosure or loss of this information could result in our violation of any U.S. or foreign data protection laws that are applicable to us, including the California Consumer Privacy Act which went into effect in January 2020. These laws and their interpretation and application are constantly evolving, and they could be interpreted and applied in a manner that is inconsistent with our current practices or they could become more stringent over time. Efforts to comply with applicable data protection laws or any new interpretations of their application could involve significant time and substantial costs or require us to change our business practices and compliance procedures, and any failures to so comply could subject us to substantial civil or criminal fines or sanctions. Any of these outcomes could have a material negative impact on our business, performance and prospects.

Our failure to comply with environmental and other applicable laws and regulations could subject us to significant fines and liabilities or cause us to incur significant costs.

We are subject to various and frequently changing U.S. federal, state and local and foreign laws and regulations relating to the protection of the environment, including laws governing the discharge of pollutants into the air and water, the management and disposal of hazardous substances and wastes and the clean-up of contaminated sites. In particular, some of our manufacturing processes may require us to handle and dispose of hazardous materials from time to time. For example, in the past our manufacturing operations have used lead-based solder in the assembly of our products. Today, we use lead-free soldering technologies in our manufacturing processes, as this is required for products entering the

European Union. We could incur substantial costs, including clean-up costs, civil or criminal fines or sanctions and third-party claims for property damage or personal injury, as a result of violations of or noncompliance with these and other environmental laws and regulations. Although we have not incurred significant costs to date to comply with these laws and regulations, new laws or changes to current laws and regulations to make them more stringent could require us to incur significant costs to remain in compliance.

We also may be subject to a variety of laws and regulations relating to other matters, including workplace health and safety, labor and employment, foreign business practices (including the U.S. Foreign Corrupt Practices Act and applicable foreign anti-bribery laws), data protection, public reporting and taxation, among others. It is difficult and costly to manage the requirements of every authority having jurisdiction over our various activities and to comply with their varying standards. Additionally, any changes to existing regulations or adoption of new regulations may result in significant additional expense to us or our customers. Further, our failure to comply with any applicable laws and regulations may result in a variety of administrative, civil and criminal enforcement measures, including monetary penalties or imposition of sanctions or other corrective requirements, any of which could materially adversely affect our reputation and our business.

Regulations related to "conflict minerals" may cause us to incur additional expenses and could limit the supply and increase the cost of certain metals used in manufacturing our products.

The U.S. Congress has enacted laws, and the SEC has adopted rules, requiring disclosure of specified minerals, known as conflict minerals, that are necessary to the functionality or production of products manufactured or contracted to be manufactured by public companies. These laws and rules require companies to verify and disclose whether or not such minerals, as used in a company's products or their manufacture, originate from the Democratic Republic of Congo or an adjoining country. Because our products contain certain conflict minerals and we or our manufacturers use these conflict minerals in the manufacture of our products, we are required to comply with these laws and disclosure rules. To comply, we are required to conduct a reasonable country of origin inquiry each year and, depending on the results of that inquiry, we may be required to exercise due diligence on the source and chain of custody of conflict minerals contained in or used to manufacture our products. Such due diligence must conform to a nationally or internationally recognized due diligence framework. We are also required to file a disclosure report with the SEC each year relating to our conflict mineral use.

The due diligence activities required to determine the source and chain of custody of minerals contained in our products or used in their manufacture are time-consuming and may result in significant costs. Due to the size and complexity of our supply chain, we face significant challenges verifying the origins of the minerals used in our products or their manufacture. Further, these rules could affect the availability in sufficient quantities and at competitive prices of certain minerals used in our products and their manufacture, which could result in increased material and component costs and additional costs associated with potential changes to our products, processes or sources of supply. Additionally, if we are unable to sufficiently verify the origin of the minerals used in our products through the due diligence measures we implement, we may not be able to satisfy customer preferences or requirements regarding the use of conflict minerals in the products they purchase, which could place us at a competitive disadvantage.

Our internal control over financial reporting may not be effective, which could have a significant and adverse effect on our business.

Section 404 of the Sarbanes-Oxley Act of 2002 and the related rules and regulations of the SEC, which we collectively refer to as Section 404, require us to evaluate our internal control over financial reporting and require management to report on the effectiveness of this internal control as of the end of each fiscal year. In addition, if and when we are no longer a "smaller reporting company" under applicable SEC rules, Section 404 will require us to obtain an attestation report from our independent registered public accounting firm as to our internal control over financial reporting.

Effective internal control is necessary for us to produce accurate and reliable financial reports and is important in our efforts to prevent financial fraud. In the course of our Section 404 evaluations, we or our independent registered public accounting firm may identify significant deficiencies or material weaknesses in our internal control over financial

reporting. If we fail to maintain an effective system of internal control over financial reporting or if management or our independent registered public accounting firm discover significant deficiencies or material weaknesses, we may be unable to produce accurate and reliable financial reports or prevent fraud, which could result in a loss of customer or investor confidence in us or our public disclosures and negatively impact our stock price. Any of these outcomes could harm our financial condition and results of operations.

Further, our Section 404 evaluations may lead us to conclude that enhancements, modifications or changes to our internal control over financial reporting are necessary or desirable. Implementing any such changes would divert the attention of management, involve significant time and costs and negatively impact our financial reporting functions during the transition, any of which could have a material negative effect on our results of operations and financial condition.

If we do not effectively manage any future growth we may experience, our resources, systems and controls may be strained and our results of operations may suffer.

Any future growth we may experience could strain our resources, management, information and telecommunication systems and operating and financial controls. To manage future growth effectively, including any expansion of volume in our manufacturing facility in the PRC, we must be able to improve and expand our systems and controls, which we may not be able to do in a timely or cost-effective manner. In addition, our management team has relatively limited experience managing a rapidly growing business. As a result, they may not be able to manage any future growth we may experience. A failure to manage any growth we may experience or improve or expand our existing systems and controls, or unexpected difficulties in doing so, could harm our business and results of operations.

If we acquire businesses or technologies or pursue other strategic transactions or relationships in the future, these transactions could disrupt our business and harm our operating results and financial condition.

From time to time, we evaluate opportunities to acquire businesses or technologies or pursue other strategic transactions or relationships, including collaboration or joint development arrangements, that might complement our current product offerings or enhance our intellectual property portfolio or technical capabilities. We have no experience acquiring other businesses or technologies.

Acquisitions and other strategic transactions or relationships entail a number of risks that could adversely affect our business and operating results, including, among others:

- difficulties integrating the operations, technologies or products of acquired companies or working with third parties with which we may partner on joint development or collaboration relationships;
- the diversion of management's time and attention from the daily operations of our business;
- insufficient increases in revenues to offset increased expenses associated with an acquisition or strategic transaction or relationship;
- difficulties retaining business relationships with our existing suppliers and customers or the suppliers and customers of an acquired company;
- overestimation of potential synergies or other benefits, or a delay in realizing these synergies or other benefits;
- entering markets in which we have no or limited experience and in which competitors have stronger market positions;
- the potential loss of key employees of our Company or an acquired company;
- exposure to contingent liabilities of an acquired company;
- depletion of cash resources to fund an acquisition or other strategic transaction or establish a strategic relationship, or dilution of existing stockholders or increased leverage relative to our earnings or to our equity capitalization if we issue debt or equity securities for these purposes;
- adverse tax consequences; and

- incurrence of material charges, such as depreciation, deferred compensation charges, in-process research and development charges, the amortization of amounts related to deferred stock-based compensation expense and identifiable purchased intangible assets or impairment of goodwill.

If any of these risks occur, we may not be able to realize the intended benefits of an acquisition or strategic transaction or relationship, and our operating results, financial condition and business prospects could be materially negatively affected.

Item 1B. Unresolved Staff Comments.

Not applicable.

Item 2. Properties

Our corporate headquarters is located in approximately 8,200 square feet of space in Irvine, California, under a lease that expires in July 2020. We also lease approximately 42,200 square feet of space for our manufacturing facility in the PRC under a lease that expires in June 2020. We believe our current facilities are adequate for our current and expected operations for the next 12 months and that additional space could be obtained if needed.

Item 3. Legal Proceedings

Certain legal proceedings in which we are involved are discussed in Part IV, Item 15 of this Form 10-K in the Notes to Consolidated Financial Statements in Note 8 “Commitments and Contingencies” under the heading “Litigation and Patent Reexaminations,” and are incorporated herein by reference.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Market Information

Our common stock began trading on The Nasdaq Global Market under the symbol "NLST" on November 30, 2006 and was transferred to The Nasdaq Capital Market effective on January 14, 2016. On September 27, 2018, our common stock was transferred to the OTCQX® Best Market.

Holders

As of March 3, 2020, there were approximately 16 holders of record of our shares of common stock, plus an indeterminate number of additional stockholders whose shares of our common stock are held on their behalf by brokerage firms or other agents.

Dividend Policy

We have never declared or paid cash dividends on our capital stock in the past, and we have no intention of declaring or paying any such dividends in the foreseeable future. Additionally, our credit facility with SVB prohibits the payment of cash dividends without obtaining SVB's prior consent. Any declaration or payment of dividends in the future will be at the discretion of our board of directors, and will depend on our results of operations, capital requirements, legal and contractual restrictions and other factors deemed relevant by our board of directors.

Item 6. Selected Financial Data

Not applicable.

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

This section contains forward-looking statements that reflect our plans, estimates and beliefs and involve numerous risks and uncertainties, including, but not limited to, those described in the "Risk Factors" section of this Form 10-K. Actual results may differ significantly from those contained in any forward-looking statements. You should carefully read the "Cautionary Note Regarding Forward-Looking Statements" and "Risk Factors" sections of this Form 10-K. The following discussion should be read in conjunction with our consolidated financial statements and accompanying notes included in Part IV, Item 15 of this Form 10-K. Unless otherwise stated, all information presented herein is based on our fiscal calendar, and references to particular years, quarters, months or periods refer to our fiscal years ended in December and the associated quarters, months and periods of those fiscal years.

Fiscal Year

Our fiscal year is the 52- or 53-week period that ends on the Saturday closest to December 31. The 2019 and 2018 fiscal years ended on December 28, 2019 and December 29, 2018, respectively, and consisted of 52 weeks.

Overview

We provide high-performance modular memory subsystems to customers in diverse industries that require enterprise and storage class memory solutions to empower critical business decisions. We have a history of introducing disruptive new products, such as one of the first load reduced dual in-line memory modules ("LRDIMM") based on our distributed buffer architecture, which has been adopted by the industry for DDR4 LRDIMM. We were also one of the first to bring NAND flash memory ("NAND flash") to the memory channel with our NVvault non-volatile dual in-line memory modules ("NVDIMM") using software-intensive controllers and merging dynamic random access memory integrated circuits ("DRAM ICs" or "DRAM") and NAND flash to solve data bottleneck and data retention challenges

encountered in high-performance computing environments. We also offer storage class memory products called HybriDIMM to address the growing need for real-time analytics in Big Data applications, in-memory databases, high performance computing and advanced data storage solutions. We publicly demonstrated a HybriDIMM prototype in August 2016 and sampled HybriDIMM to select customers in the second half of 2017. We are continuously developing and improving upon the HybriDIMM product while exploring opportunities with strategic partners.

Due to the ground-breaking product development of our engineering teams, we have built a robust portfolio of over 130 issued and pending U.S. and foreign patents, many seminal, in the areas of hybrid memory, storage class memory, rank multiplication and load reduction. Since our inception, we have dedicated substantial resources to the development, protection and enforcement of technology innovations we believe are essential to our business. Our early pioneering work in these areas has been broadly adopted in industry-standard registered dual in-line memory modules ("RDIMM"), LRDIMM and in NVDIMM. Our objective is to continue to innovate in our field and invest further in our intellectual property portfolio, with the goal of monetizing our intellectual property through a combination of product sales and licensing, royalty or other revenue-producing arrangements, which may result from joint development or similar partnerships or defense of our patents through enforcement actions against parties we believe are infringing them.

We also resell solid state drive ("SSD"), NAND flash, DRAM products and other component products to end-customers that are not reached in the distribution models of the component manufacturers, including storage customers, appliance customers, system builders and cloud and datacenter customers.

In 2019 and 2018, we recorded total net sales of $26.1 million and $33.5 million, gross profit of $2.6 million and $2.3 million, and net loss of $12.5 million and $17.1 million, respectively. We have historically financed our operations primarily with proceeds from issuances of equity and debt securities and cash receipts from revenues, including from product sales and a non-recurring engineering ("NRE") fee from our November 2015 joint development and license agreement ("JDLA") with Samsung Electronics Co., Ltd ("Samsung"). We have also funded our operations with a revolving line of credit and term loans under a bank credit facility, and a funding arrangement for costs associated with certain of our legal proceedings against SK hynix, Inc. a South Korean memory semiconductor supplier ("SK hynix"). See "Liquidity and Capital Resources" below for more information.

Fiscal 2019-2020 Developments

Developments relating to SK hynix Proceedings

We have taken action to protect and defend our innovations by filing legal proceedings for patent infringement against SK hynix and two of its subsidiaries in the U.S. International Trade Commission ("ITC"), U.S. district court and the courts of Germany. On January 31, 2019, the court in Germany found there was no infringement of the Utility Model asserted and dismissed the case. We do not intend to appeal this ruling. In our two separate ITC actions against SK hynix, we have requested exclusion orders that direct U.S. Customs and Border Protection to stop allegedly infringing SK hynix RDIMM and LRDIMM products from entering the United States. In our U.S. district court proceedings (which are currently stayed), we are primarily seeking damages. All of our patents involved in these proceedings allegedly cover key features of RDIMM and LRDIMM products.

On January 16, 2018, the ITC issued a final determination regarding our first ITC action against SK hynix filed in September 2016, in which it concluded there was no infringement of the patents in this action and terminated the ITC's investigation related to these proceedings. We appealed this final determination to the Court of Appeals for the Federal Circuit, and oral arguments for this appeal were scheduled for December 5, 2019 at the Court of Appeals for the Federal Circuit. On December 12, 2019, the Court of Appeals for the Federal Circuit affirmed the invalidity ruling by the Patent Trial and Appeal Board ("PTAB") involving the patents in litigation at the first ITC Action and dismissed the appeal of the final determination of the first ITC Action as moot.

In our second ITC action against SK hynix, on April 12, 2018, the ITC granted SK hynix's motion for summary determination of non-infringement and terminated the investigation in its entirety. On April 23, 2018, the Company filed a petition seeking ITC review of this decision. On May 29, 2018, the ITC Commission remanded the Second ITC Action back to the ALJ to resolve the parties' claim construction disputes and continue the investigation. On June 14, 2018, the

ITC extended the target date for the final determination to August 5, 2019, with a final initial determination due by April 5, 2019. Based on this extended target date, the ITC scheduled a hearing on the merits to begin on December 14, 2018 and conclude on December 21, 2018. On September 13, 2018, the ITC rescheduled the hearing on the merits to begin on January 14, 2019 and conclude on January 18, 2019. On January 29, 2019, due to the government shutdown, the ITC again rescheduled the hearing on the merits to begin on March 11, 2019 and conclude on March 15, 2019. On March 12, 2019 the ALJ postponed the trial due to reasons unrelated to the dispute between the parties. The trial recommenced on July 15, 2019 and ended on July 19, 2019. An initial determination regarding our second ITC action against SK hynix was issued on October 21, 2019. In the initial determination, the Chief Administrative Law Judge found in Netlist's favor held there was a violation of Section 337 of the Tariff Act of 1930 as amended with respect to U.S. Patent No. 9,606,907 and alternatively found there was no violation with respect to U.S. Patent No. 9,535,623. A final determination regarding our second ITC action against SK Hynix is expected to be issued on April 7, 2020.

First Amendment to TRGP Agreement

On January 23, 2020, we entered into the first amendment to the investment agreement dated May 3, 2017 with TR Global Funding V, LLC ("TRGP") ("TRGP Agreement") to amend the recovery sharing formula related to claims against SK hynix for alleged infringement of our patents. TRGP Agreement generally provides that TRGP will directly fund the costs incurred by us or on our behalf in connection with our first ITC action and our U.S. district court proceedings against SK hynix.

Amendment to SVB Credit Agreement

On February 27, 2020, we entered into an amendment to a credit agreement dated October 31, 2009 with Silicon Valley Bank ("SVB") (the "SVB Credit Agreement") to extend the maturity date of the borrowings under the SVB Credit Agreement from March 30, 2020 to April 30, 2021.

2019 Lincoln Park Purchase Agreement

On June 24, 2019, we entered into a purchase agreement (the "2019 Purchase Agreement") with Lincoln Park Capital Fund, LLC ("Lincoln Park"), pursuant to which we have the right to sell to Lincoln Park up to an aggregate of $10 million in shares of our common stock over the 36-month term of the 2019 Purchase Agreement subject to the conditions and limitations set forth in the 2019 Purchase Agreement. As consideration for entering into the 2019 Purchase Agreement, we issued to Lincoln Park 818,420 shares of our common stock as initial commitment shares in a noncash transaction on June 24, 2019 and will issue up to 818,420 additional shares of our common stock as additional commitment shares on a pro rata basis in connection with any additional purchases. We will not receive any cash proceeds from the issuance of these additional commitment shares.

During 2019, Lincoln Park purchased an aggregate of 19,044,762 shares of our common stock for a net purchase price of $6.4 million. In connection with the purchases, the Company issued to Lincoln Park an aggregate of 523,633 shares of our common stock as additional commitment shares in noncash transactions.

2020 Lincoln Park Purchase Agreement

On March 5, 2020, we entered into a purchase agreement (the "2020 Purchase Agreement") with Lincoln Park, pursuant to which we have the right to sell to Lincoln Park up to an aggregate of $20 million in shares of our common stock over the 36-month term of the 2020 Purchase Agreement subject to the conditions and limitations set forth in the 2020 Purchase Agreement. As consideration for entering into the 2020 Purchase Agreement, we issued to Lincoln Park 1,529,052 shares of our common stock as initial commitment shares in a noncash transaction on March 6, 2020 and will issue up to 917,431 additional shares of our common stock as additional commitment shares on a pro rata basis in connection with any additional purchases. We will not receive any cash proceeds from the issuance of these additional commitment shares.

Based on the number of shares of our common stock authorized as of the date of the 2020 Purchase Agreement, unless the trading price of our common stock increases substantially, we will not be able to utilize all of the capacity of

the equity line financing unless we increase the total number of our authorized shares, which would require the approval of a majority of our outstanding shares voting at a duly convened stockholder meeting.

Completion of Iliad Note Conversion

During 2019, Iliad Research and Trading, L.P. ("Iliad") fully-converted the outstanding principal and accrued interest on the Iliad Note to shares of our common stock as follows: (1) $1.9 million of the outstanding principal and accrued interest on the unsecured convertible promissory note we issued to Iliad on August 27, 2018 ("Iliad Note") to 7,778,270 shares of our common stock at the Redemption Conversion Price, as defined in a Securities Purchase Agreement dated August 27, 2018 ("Iliad Purchase Agreement") and (2) $0.5 million of the outstanding principal and accrued interest on the Iliad Note to 1,388,890 shares of our common stock at the Lender Conversion Price, as defined in the Iliad Purchase Agreement. As a result of these conversions, as of December 28, 2019, there were no outstanding principal and accrued interest on the Iliad Note.

Factors Affecting Our Performance

Trends in Net Sales

We have been substantially dependent on sales of single products or product categories. For instance, we have historically been dependent on sales of our memory subsystem products, and in recent periods, we have been dependent on our resales of component products. Demand for any of these products could increase or decrease at any time for a number of reasons, including new customer qualifications, changing customer requirements or preferences, product obsolescence, introduction of more advanced or otherwise superior products by us or our competitors, the ability of our customers to obtain these products or substitute products from alternate sources, customers increasing or reducing their need for these products generally, or a variety of other factors. We have no long-term agreements or other commitments with respect to sales of any of these products. As a result, any fluctuations in demand for these products from us would impact our sale levels and net sales.

In past years, we have experienced declines in demand for and sales of our memory subsystem products, and these declines could continue or intensify in the future. Contrastingly, we have recently experienced marked increases in component product resales. Because the cost of the component products we purchase for resale is added to our cost of sales for these products, our gross margin on resales of component products is generally significantly lower than our gross margin on sales of our memory subsystem products. As a result, increases or decreases in component product resales as a percentage of our total sales have a significant impact on our gross margins.

Next-generation HybriDIMM and some of our other next-generation products may require additional time and capital investments in order to commercialize, and our development and commercialization strategies for these products, including, for instance, our work with JEDEC to facilitate broad industry adoption of this new technology, may not be successful. Our ability to obtain customer or market acceptance of these next-generation products will materially impact our net product sales and gross profits, as well as our ability to recoup our investments in developing these products.

Customer Composition and Concentrations

Our target markets are characterized by a limited number of large companies, and consolidation in one or more of these target markets may further increase this concentration. As a result, sales to small numbers of customers have historically represented a substantial portion of our net sales, and we expect this concentration to continue. Additionally, the composition of major customers and their respective contributions to our net sales have fluctuated and will likely continue to fluctuate from period to period as our existing and prospective customers progress through the life cycle of the products they produce and sell and experience resulting fluctuations in their product demand. We believe our performance depends in significant part on our ability to establish and maintain relationships with and effect substantial sales to our large customers. We do not have long-term agreements with any of our customers and, as result, any or all of them could decide at any time to increase, accelerate, decrease, delay or discontinue their purchase of our products or the component products we resell. These fluctuations in customer demand and concentrations could significantly impact our net sales.

Product Sale Prices

The prices customers pay for the products we sell can fluctuate due to many factors, including, among others, competitive conditions in our key customer markets, changes in customer requirements or preferences, volatility in the market prices for SSDs, DRAM ICs, NAND flash and other component products, and changes in manufacturing efficiencies or capacities. Our industry has historically been characterized by declines in average sale prices. If sale price declines are not offset by corresponding decreases in costs or increases in sales volume or sales of products with higher margins, these sale price declines could have a material adverse effect on our operating results.

Once our prices with a customer are negotiated, we are generally unable to revise pricing with that customer until our next regularly scheduled price adjustment. As a result, if market prices for essential components increase, we generally cannot pass the price increases through to our customers for products purchased under an existing purchase order. Consequently, we are exposed to the risks associated with the volatility of prices for these components and our cost of sales could increase and our gross margins could decrease in the event of sudden price increases. Alternatively, if there are declines in the prices of these components, we may be required to reduce our selling prices for subsequent purchase orders, which may result in a decline in our net sales.

In addition, because a large percentage of our sales are often from sales to a small number of customers, these customers may exert pressure on us to make concessions in the prices at which we sell products to them. These sale price concessions could have a material effect our net sales.

Component Product Supply

Our ability to fulfill customer orders for our memory subsystem products or the component products we resell is dependent on a sufficient supply of SSDs, DRAM ICs, NAND flash and other component products. We have no long-term supply contracts for any of these component products. There are a relatively small number of suppliers of these components, and we typically purchase from only a subset of these suppliers.

From time to time, shortages in SSDs, DRAM ICs and NAND flash have required some suppliers to limit the supply of these components. In the past, we have experienced supply chain disruptions and shortages of DRAM and NAND flash required to create certain of our memory subsystem products, and we have been forced to procure the component products we resell from other suppliers to the extent sufficient product is not available from Samsung to meet customer demand or in the event of other Samsung supply issues. Supply shortages can occur at any time and for a variety of reasons, including, among others, spikes in customer demand that cannot be satisfied by our suppliers, any problems that arise with the supplier's manufacturing operations or facilities that cause disruptions or delays, or any failure by the supplier to comply with the terms of its supply arrangements with us. If we are not able to obtain components in the amounts needed, on a timely basis and at commercially reasonable prices, we may lose customers due to order delivery interruptions or failures, which could impact our net sales, and we may experience increases in our cost of sales if we are forced to procure components from alternative suppliers and are not able to negotiate favorable terms with these suppliers. For example, with respect to Samsung, any inability to obtain sufficient component products from Samsung could increase our cost of sales for component product resales because we may not be able to make arrangements with other suppliers on financial and other terms comparable to those we have negotiated with Samsung under the JDLA. As described above, we may or may not be able to pass any such cost increases through to our customers, in which case they could materially adversely impact our results by increasing our cost of sales without a corresponding increase in our net sales.

Product Demand Forecasting

Because of the short-term nature of the commitments by many of our customers and the short turnaround times that apply to most orders, as well as our customers' ability to cancel or defer purchase orders for any reason, we are required to make component procurement decisions based on forecasts of customer demand for the products we sell.

Our production expense and component purchase levels are to a large extent fixed in the short term. As a result, we may be unable to adjust spending on a timely basis to compensate for any unexpected shortfall in customer orders. If we overestimate customer demand, we may have excess component or finished goods inventory, which may not be able to be used in other products or resold and may become obsolete before any such use or resale. If there is a subsequent decline in the prices of components, the value of our inventory would fall and we may be required to write-down the value of our component inventory, which may result in a significant increase in our cost of sales and decrease in our gross margins. In the past, we have had to write-down inventory due to obsolescence, excess quantities and declines in market value below our costs. As a result, any significant shortfall of customer orders in relation to our expectations could hurt our operating results, cash flows and financial condition.

Conversely, any rapid increases in demand by our customers could strain our resources. If we underestimate customer demand, we may not have sufficient inventory of necessary components on hand to meet that demand and we may need to try to procure additional quantities, which may not be available or may only be available at high prices or on otherwise unfavorable terms. We also may not have sufficient manufacturing capacity at any given time to meet any demands for rapid increases in production of our memory subsystem products. Any shortages of inventory or manufacturing capacity could lead to delays in the delivery of products, which may reduce our net sales.

In addition, if our product demand forecasts are inaccurate, we may understate or overstate the provision required for excess and obsolete inventory. If our inventories are determined to be overvalued, we would be required to recognize additional expense in our cost of sales at the time of the determination. Conversely, if our inventories are determined to be undervalued, we may have over-reported our costs of sales in previous periods and would be required to recognize additional gross profit at the time the inventories are sold.

Intellectual Property Protection, Enforcement and Monetization

We dedicate substantial resources to developing technology innovations we believe are essential to our business. We intend to pursue monetization avenues for our intellectual property portfolio, potentially including licensing, royalty or other revenue-producing arrangements. However, we have not generated any such revenue stream from our intellectual property to date. If we are not successful in monetizing our intellectual property portfolio, we may never recoup our investments of time, capital and other resources in the development, maintenance, defense and enforcement of this portfolio, which could materially adversely affect our results of operations.

We also dedicate substantial resources to protecting and enforcing our intellectual property rights, including with patent infringement proceedings we file against third parties and defense of our patents against challenges made by way of reexamination and review proceedings at relevant government agencies. We expect these activities to continue for the foreseeable future, with no guarantee that any ongoing or future patent protection or litigation activities will be successful. We are also subject to litigation based on claims that we have infringed the intellectual property rights of others. Any litigation, regardless of its outcome, is inherently uncertain, involves a significant dedication of resources, including time and capital, and diverts management's attention from our other activities. As a result, any current or future infringement claims or patent challenges by or against third parties, whether or not eventually decided in our favor or settled, could materially adversely affect our business, financial condition and results of operations. Additionally, the outcome of pending or future litigation and related patent reviews and reexaminations, as well as any delay in their resolution, could affect our ability to continue to sell our products, protect against competition in the current and expected markets for our products or license or otherwise monetize our intellectual property rights in the future.

Business Risks and Uncertainties

Our business, financial condition and prospects are exposed to a number of risks and uncertainties. See the discussion in Part I, Item 1A. Risk Factors of this Form 10-K for more information.

Results of Operations

The table below presents selected items of our consolidated statements of operations as a percentage of net sales for 2019 and 2018.

	2019	2018
Net sales	100 %	100 %
Cost of sales	90	93
Gross profit	10	7
Operating expenses:		
Research and development	9	9
Intellectual property legal fees	16	27
Selling, general and administrative	29	20
Total operating expenses	54	56
Operating loss	(44)	(49)
Total other expense, net	(4)	(2)
Loss before provision (benefit) for income taxes	(48)	(51)
Provision (benefit) for income taxes	—	—
Net loss	(48)%	(51)%

Net Sales, Cost of Sales, and Gross Profit

The following table presents net sales, cost of sales and gross profit for 2019 and 2018 (dollars in thousands):

	2019	2018	Change
Net sales	$ 26,103	$ 33,529	(22%)
Cost of sales	23,533	31,228	(25%)
Gross profit	$ 2,570	$ 2,301	12%
Gross margin	9.8%	6.9%	

Net Sales

Net sales include resales of certain component products, including SSDs and DRAM products, and sales of our high-performance memory subsystems. In 2019 and 2018, resales of component products represented 77% and 75% of net sales, respectively.

Net sales decreased 22% or $7.4 million during 2019 compared to 2018 primarily as a result of a $4.2 million decrease in the resales of SODIMM and RDIMM products, a $3.1 million decrease in sales of our Specialty SODIMM and RDIMM products and a $0.3 million decrease in sales of our very low profile ("VLP") memory subsystem products, partially offset by a $0.3 million increase in sales of SSDs.

Our product sales were impacted by fluctuating customer concentrations. During 2019, there were no customers who accounted for more than 10% of our net sales, while during 2018, there was one customer that accounted for more than 10% of our net sales. During 2019 and 2018, our four largest customers accounted for an aggregate of 23% and 38% of our net sales, respectively.

Cost of Sales and Gross Profit

Cost of sales decreased in 2019 compared to 2018 due primarily to lower SODIMM and RDIMM product sales. Gross profit increased in 2019 compared to 2018 due primarily to higher gross profits on our SSD products and the resales of SODIMM and RDIMM products, partially offset by lower gross profit on the sales of our Specialty SODIMM

and RDIMM products. Year-over-year gross margin (or gross profit as a percentage of net sales) increased during 2019 due primarily to the increased margin on the SODIMM and RDIMM products and NAND products.

Operating Expenses

The following table presents operating expenses for 2019 and 2018 (dollars in thousands):

	2019	2018	Change
Research and development	$ 2,383	$ 2,899	(18%)
Intellectual property legal fees	4,131	8,918	(54%)
Selling, general and administrative	7,546	6,856	10%
Total operating expenses	$ 14,060	$ 18,673	

Research and Development

Research and development expenses decreased in 2019 compared to 2018 primarily as a result of a $0.5 million decrease in headcount-related expenses and depreciation expenses. This is due to the decline in demand for our memory subsystem products and increase in component product resales in recent years.

Intellectual Property Legal Fees

Intellectual property legal fees consist of legal fees incurred for patent filings, protection and enforcement. Although we expect intellectual property legal fees to generally increase over time as we continue to protect, defend and enforce and seek to expand our patent portfolio, these increases may not be linear but may occur in lump sums depending on the due dates of patent filings and their associated fees and the arrangements we may make with our legal advisors in connection with enforcement proceedings, which may include fee arrangements such as with TRGP or contingent fee arrangements in which we would pay these legal advisors on a scaled percentage of any negotiated fees, settlements or judgments awarded to us based on if, how and when the fees, settlements or judgments are obtained. See Note 8 “Commitments and Contingencies” to the consolidated financial statements in Part IV, Item 15 of this Form 10-K for further discussion.

Pursuant to the terms of the TRGP Agreement, the legal expenses we incurred for our first action against SK hynix at the ITC and our U.S. district court proceedings that were paid directly by TRGP were excluded in their entirety from our financial statements. As of December 28, 2019, accumulated deficit excluded $1.7 million and $10.2 million of such legal expenses incurred in 2018 and 2017, respectively. In 2019, we did not have such legal expenses incurred that were excluded from our financial statements. TPGP does not fund the legal expenses incurred for our second ITC action and our proceedings in international courts. Any settlement or other cash proceeds we may recover in the future in connection with our first ITC action against SK hynix that were funded by TRGP would be reduced by the aggregate amount of legal expenses we excluded as a result of TRGP’s payment of these expenses, plus the premium amount due to TRGP under the terms of the TRGP Agreement at the time of any such recovery. As a result, so long as the TRGP Agreement remains in effect, we expect our intellectual property legal fees may show different trends. Additionally, we expect our intellectual property legal fees would be significantly higher in the period in which a recovery from the SK hynix proceedings covered by the TRGP Agreement, if any, occurs.

Intellectual property legal fees decreased in 2019 as compared to 2018 due primarily to lower legal expenses incurred to defend our patent portfolio internationally, including the costs incurred for our second ITC action and *inter partes review* of our patents before the U.S. Patent and Trademark Office.

Selling, General and Administrative

SG&A expenses increased in 2019 compared to 2018 primarily as a result of a $1.1 million increase in payroll and related compensation expenses and travel expenses related to employment of additional sales and marketing personnel to support new business revenue, partially offset by a $0.3 million decrease in professional fees and public company expenses.

Other Expense, Net

The following table presents other expense, net for 2019 and 2018 (dollars in thousands):

	2019	2018	Change
Interest expense, net	$ (945)	$ (739)	28%
Other expense, net	(4)	(11)	(64%)
Total other expense, net	$ (949)	$ (750)	27%

Interest expense, net, in 2019 and 2018 consisted primarily of interest expense on a revolving line of credit under the SVB Credit Agreement, the $15 million senior secured convertible note issued to Samsung Venture Investment Co. (“SVIC”) (“SVIC Note”) in November 2015 and the Iliad Note issued in August 2018. Interest expense also includes the accretion of debt discounts and amortization of debt issuance costs on the SVIC Note and Iliad Note. The increase in 2019 compared to 2018 was primarily driven by the full year of interest expense, accretion of debt discount and amortization of debt issuance costs in 2019 related to the Iliad Note issued in August 2018.

Liquidity and Capital Resources

Our primary sources of cash are historically proceeds from issuances of equity and debt securities and receipts from revenues, including from product sales and the NRE fee from our JDLA with Samsung. We have also funded our operations with a revolving line of credit under a bank credit facility, a funding arrangement for costs associated with certain of our legal proceedings against SK hynix and, to a lesser extent, equipment leasing arrangements.

The following table presents selected financial information as of and for the years ended December 28, 2019 and December 29, 2018 (in thousands):

	2019	2018
Cash and cash equivalents	$ 8,966	$ 14,802
Convertible promissory notes and accrued interest, net	15,793	17,346
Working capital	5,442	10,079
Net cash used in operating activities	(11,485)	(10,568)
Net cash used in investing activities	(83)	(74)
Net cash provided by financing activities	6,632	17,774

Cash Flows from Operating Activities

Net cash used in operating activities for 2019 was primarily a result of a net loss of $12.5 million, adjusted for non-cash charges of $2.6 million, which primarily consisted of stock-based compensation, non-cash lease expense, amortization of debt discounts and interest accrued on our convertible notes. These non-cash activities are offset by net cash outflows from changes in working capital balances of $1.8 million driven predominantly by a $0.8 million increase in accounts receivable due to higher sales in the fourth quarter of 2019, a $0.6 million increase in inventories due to higher purchases to support increased sales, and a $0.6 million decrease in accrued expenses and other current liabilities primarily from the decrease in operating lease liabilities, partially offset by a decrease of $0.5 million in prepaid expenses and other current liabilities.

Net cash used in operating activities for 2018 was primarily a result of a net loss of $17.1 million, adjusted for non-cash charges of $1.7 million. These non-cash charges primarily consisted of stock-based compensation, interest accrued on convertible notes, depreciation and amortization and amortization of debt discounts. The net loss is offset by net cash inflows from changes in working capital balance of $4.8 million driven predominantly from an increase in accounts payable due to an increase in legal fees.

Cash Flows from Investing Activities

Net cash used in investing activities for 2019 and 2018 was primarily the result of purchases of property and equipment during the periods.

Cash Flows from Financing Activities

Net cash provided by financing activities for 2019 primarily consisted of $6.4 million in proceeds from issuance of common stock to Lincoln Park and $0.7 million in net borrowings under the SVB Credit Agreement, partially offset by $0.4 million in payment of note payable to finance insurance policies.

Net cash provided by financing activities for 2018 primarily consisted of $9.2 million in net proceeds from the 2018 Offering, $5.8 million in net proceeds from the ATM Program, $2.1 million from the issuance of the Iliad Note, $0.8 million from the issuance of common stock to a trust controlled by our President, Chief Executive Officer and Chairman of the Board, and $0.3 million in net borrowings under the SVB Credit Agreement, partially offset by $0.3 million in payment of note payable to finance insurance.

Capital Resources

2019 Lincoln Park Purchase Agreement

On June 24, 2019, we entered into the 2019 Purchase Agreement with Lincoln Park, pursuant to which we have the right to sell to Lincoln Park up to an aggregate of $10 million in shares of our common stock over the 36-month term of the 2019 Purchase Agreement subject to the conditions and limitations set forth in the 2019 Purchase Agreement. As of December 28, 2019, an aggregate of $3.6 million in shares of our common stock was available for purchases over the remaining term under the 2019 Purchase Agreement.

2020 Lincoln Park Purchase Agreement

On March 5, 2020, we entered into the 2020 Purchase Agreement with Lincoln Park, pursuant to which we have the right to sell to Lincoln Park up to an aggregate of $20 million in shares of our common stock over the 36-month term of the 2020 Purchase Agreement subject to the conditions and limitations set forth in the 2020 Purchase Agreement.

2018 Offering

On September 12, 2018, we entered into a Securities Purchase Agreement with certain investors, pursuant to which we issued and sold to the investors in the 2018 Offering an aggregate of 22,222,220 shares of our common stock and warrants to purchase up to an aggregate of 11,111,110 shares of our common stock at a per share purchase price of $0.45 per share. The 2018 Offering closed on September 14, 2018. The net proceeds to us from the 2018 Offering were $9.2 million, after deducting placement agent fees and offering costs paid by us.

Iliad Note

On August 27, 2018, we entered into the Iliad Purchase Agreement with Iliad, pursuant to which we issued a $2.3 million Iliad Note with an original debt discount of $0.2 million. The Iliad Note bore interest at an annual rate of 8% and would mature on August 27, 2020, unless earlier repurchased, redeemed or converted in accordance with its terms. During 2019, Iliad fully converted the outstanding principal and accrued interest on the Iliad Note to shares of our common stock as follows: (1) $1.9 million of the outstanding principal and accrued interest on the Iliad Note to 7,778,270 shares of our common stock at the Redemption Conversion Price and (2) $0.5 million of the outstanding principal and accrued interest on the Iliad Note to 1,388,890 shares of our common stock at the Lender Conversion Price. As a result, as of December 28, 2019, there were no outstanding principal and accrued interest on the Iliad Note.

Share Purchase Agreement

On May 17, 2018, we entered into a Board approved arm's length Share Purchase Agreement with a trust controlled by C.K. Hong, our President, Chief Executive Officer and Chairman of the Board, pursuant to which we sold to the trust 5,405,405 shares of our common stock at a price per share of $0.148 (the closing price of our common stock as of the signing of the agreement). The net proceeds received by us were $0.8 million.

TRGP Agreement

On May 3, 2017, we entered into the TRGP Agreement, which generally provided that TRGP will directly fund the costs incurred by us or on our behalf in connection with our first ITC action and our U.S. district court proceedings against SK hynix. During 2018 and 2017, TRGP directly paid $1.7 million and $10.2 million on our behalf incurred in connection with these proceedings. On January 23, 2020, we entered into an amendment to the TRGP Agreement to alter the recovery sharing formula related to claims against SK hynix.

SVB Credit Agreement

On October 31, 2009, we entered into an SVB Credit Agreement, which provides for a revolving line of credit of up to $5.0 million. The borrowing base is limited to 85% of eligible accounts receivable (increased from 80% as of August 29, 2018), subject to certain adjustments as set forth in the SVB Credit Agreement. As of December 28, 2019, the borrowings under the SVB Credit Agreement bear interest at the Wall Street Journal "prime rate" plus 2.75% per annum and mature on March 30, 2020. On February 27, 2020, the SVB Credit Agreement was amended to extend the maturity date to April 30, 2021.

As of December 28, 2019, the outstanding borrowings under the SVB Credit Agreement were $3.0 million with additional borrowing availability of $0.2 million. During 2019, we made net borrowings of $0.7 million under the SVB Credit Agreement.

SVIC Note

On November 18, 2015, we issued the SVIC Note, which has an original principal amount of $15.0 million, accrues interest at a rate of 2.0% per year, is due and payable in full on December 31, 2021, and is convertible into shares of our common stock at a conversion price of $1.25 per share, subject to certain adjustments, on the maturity date of the SVIC Note. Partial proceeds from the SVIC Note were used to repay a former loan from a different lender.

Sufficiency of Cash Balances and Potential Sources of Additional Capital

We believe our existing balance of cash and cash equivalents together with cash receipts from revenues, borrowing availability under the SVB Credit Agreement, the equity financing available under the 2020 and 2019 Lincoln Park Purchase Agreements, funds raised through the debt and equity offerings and taking into account cash expected to be used in our operations, will be sufficient to meet our anticipated cash needs for at least the next 12 months. Our capital requirements will depend on many factors, including, among others: the acceptance of, and demand for, our products; our levels of net product sales and any other revenues we may receive, including NRE, license, royalty or other fees; the extent and timing of any investments in developing, marketing and launching new or enhanced products or technologies; the costs of developing, improving and maintaining our internal design, testing and manufacturing processes; the costs associated with defending and enforcing our intellectual property rights; and the nature and timing of acquisitions and other strategic transactions in which we participate, if any.

Although we expect to rely in the near term on our existing cash and cash equivalents balance and our primary source of cash described above, our estimates of our operating revenues and expenses and working capital requirements could be incorrect, and we may use our cash resources faster than we anticipate. Further, some or all of our ongoing or planned investments may not be successful and could result in further losses. Until we can generate sufficient revenues to finance our cash requirements from our operations, which we may never do, we may need to increase our liquidity and capital resources by one or more measures, which may include, among others, reducing operating expenses,

restructuring our balance sheet by negotiating with creditors and vendors, entering into strategic partnerships or alliances, raising additional financing through the issuance of debt, equity or convertible securities or pursuing alternative sources of capital, such as through asset or technology sales or licenses or other alternative financing arrangements. We may not be able to obtain capital when needed, on terms acceptable to us or at all and may have the need to seek the authorization of additional shares from our stockholders, which could be costly, time-consuming and unsuccessful.

Inadequate working capital would have a material adverse effect on our business and operations and could cause us to fail to execute our business plan, fail to take advantage of future opportunities or fail to respond to competitive pressures or customer requirements. A lack of sufficient funding may also require us to significantly modify our business model and/or reduce or cease our operations, which could include implementing cost-cutting measures or delaying, scaling back or eliminating some or all of our ongoing and planned investments in corporate infrastructure, research and development projects, business development initiatives and sales and marketing activities, among other activities. Modification of our business model and operations could result in an impairment of assets, the effects of which cannot be determined. Furthermore, if we continue to issue equity or convertible debt securities to raise additional funds, our existing stockholders may experience significant dilution, and the new equity or debt securities may have rights, preferences and privileges that are superior to those of our existing stockholders. If we incur additional debt, it may increase our leverage relative to our earnings or to our equity capitalization or have other material consequences. If we pursue asset or technology sales or licenses or other alternative financing arrangements to obtain additional capital, our operational capacity may be limited and any revenue streams or business plans that are dependent on the sold or licensed assets may be reduced or eliminated. Moreover, we may incur substantial costs in pursuing any future capital-raising transactions, including investment banking, legal and accounting fees, printing and distribution expenses and other similar costs, which would reduce the benefit of the capital received from the transaction.

Off-Balance Sheet Arrangements.

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

Critical Accounting Policies

The preparation of our consolidated financial statements in conformity with accounting principles generally accepted in the United States requires management to make judgments, assumptions and estimates that affect the amounts reported. Note 2 “Summary of Significant Accounting Policies” of the notes to consolidated financial statements in Part IV, Item 15 of this Form 10-K describes the significant accounting policies and methods used in the preparation of our consolidated financial statements. We base our estimates on historical experience and on various other assumptions we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Actual results may differ from these estimates, and such differences may be material. We have reviewed our critical accounting policies and estimates with the audit committee of our board of directors.

Allowance for Doubtful Accounts

We perform credit evaluations of our customers’ financial condition and limit the amount of credit extended to our customers as deemed necessary, but generally require no collateral. We evaluate the collectability of accounts receivable based on a combination of factors. In cases where we are aware of circumstances that may impair a specific customer’s ability to meet its financial obligations subsequent to the original sale, we will record an allowance against amounts due, and thereby reduce the net recognized receivable to the amount we reasonably believe will be collected. For accounts receivable from our international customers, we purchase comprehensive foreign credit insurance to mitigate risks related to the collectability. For all other customers, we record allowances for doubtful accounts based primarily on the length of time the receivables are past due based on the terms of the originating transaction, the current business environment, and our historical experience. Uncollectible accounts are charged against the allowance for doubtful accounts when all cost-effective commercial means of collection have been exhausted. Generally, our credit

losses have been within expectations and the provisions established. However, we cannot guarantee that we will continue to experience credit loss rates similar to those experienced in the past.

Our accounts receivable are generally highly concentrated among a small number of customers, and a significant change in the liquidity or financial position of one of these customers could have a material adverse effect on the collectability of our accounts receivable, liquidity and future operating results.

Inventories

We value inventories at the lower of cost or the net realizable value. Cost is determined on an average cost basis which approximates actual cost on a first-in, first-out basis and includes raw materials, labor and manufacturing overhead. Net realizable value is the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal, and transportation. On a regular basis, we evaluate inventory balances for excess quantities and obsolescence by analyzing estimated demand, inventory on hand, sales levels and other information and reduce inventory balances to net realizable value for excess and obsolete inventory based on this analysis. Once established, lower of cost or net realizable value write-downs are considered permanent adjustments to the cost basis of the excess or obsolete inventories.

Impairment of Long-Lived Assets

We evaluate the recoverability of the carrying value of long-lived assets held and used by us in our operations for impairment on at least an annual basis or whenever events or changes in circumstances indicate that their carrying value may not be recoverable. When such factors and circumstances exist, we compare the projected undiscounted future net cash flows associated with the related asset or group of assets over their estimated useful lives against their respective carrying amount. These projected future cash flows may vary significantly over time as a result of increased competition, changes in technology, fluctuations in demand, consolidation of our customers and reductions in average sale prices. If the carrying value is determined not to be recoverable from future operating cash flows, the asset is deemed impaired and an impairment loss is recognized to the extent the carrying value exceeds the estimated fair value of the asset. The fair value of the asset or asset group is based on market value when available, or when unavailable, on discounted expected cash flows.

Warranty Liability

We offer product warranties generally ranging from one to three years, depending on the product and negotiated terms of any purchase agreements with our customers. Such warranties require us to repair or replace defective product returned to us during the warranty period at no cost to the customer. Warranties are not offered on sales of component products. We record an estimate for warranty-related costs at the time of sale based on our historical and estimated future product return rates and expected repair or replacement costs. While such costs have historically been within management's expectations and the provisions established, unexpected changes in failure rates could have a material adverse impact on us, requiring additional warranty reserves, and could adversely affect our gross profit and gross margins.

Stock-Based Compensation

Stock-based awards are comprised principally of stock options, restricted stocks and restricted stock units. Stock-based compensation cost is measured at the grant date based on the fair value of the award and is recognized as an expense over the requisite service period, which is the vesting period, on a straight-line basis, net of estimated forfeitures. We use the Black-Scholes option pricing model to determine the grant date fair value of stock options. The model requires us to estimate the expected volatility and expected term of the stock options, which are highly complex and subjective variables. The expected volatility is based on the historical volatility of our common stock. The expected term is computed using the simplified method as our best estimate given our lack of actual exercise history. The risk-free rate selected to value any particular grant is based on the U.S. Treasury rate that corresponds to the expected term of the grant effective as of the date of the grant. The expected dividend assumption is based on our history and management's

expectation regarding dividend payouts. The grant-date fair value of restricted stocks and restricted stock units equals the closing price of our common stock on the grant date.

Prior to the adoption of Financial Accounting Standards Board ("FASB") Accounting Standards Update ("ASU") No. 2018-07, *Compensation – Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting* ("ASU 2018-07" or "Topic 718") in the second quarter of 2018, we accounted for equity-based awards to non-employees in accordance with ASC Topic 505, *Equity*. All transactions in which goods or services were the consideration received for the issuance of equity instruments were accounted for based on the fair value of the consideration received or the fair value of the equity instrument issued, whichever was more reliably measurable. The measurement date used to determine the estimated fair value of the equity instrument issued was the earlier of the date on which the third-party performance was complete or the date on which it was probable that performance would occur. Upon the adoption of ASU No. 2018-07, we account for all stock-based awards in accordance with Topic 718.

Income Taxes

Deferred income tax assets and liabilities are recognized for temporary differences between the financial statement carrying amounts of assets and liabilities and the amounts that are reported in the income tax returns. Deferred taxes are evaluated for realization on a jurisdictional basis. We record valuation allowances to reduce deferred tax assets to the amount that is more likely than not to be realized. In making this assessment, management analyzes future taxable income, reversing temporary differences and ongoing tax planning strategies. Should a change in circumstances lead to a change in judgment about the realizability of deferred tax assets in future years, we will adjust related valuation allowances in the period that the change in circumstances occurs, along with a corresponding increase or charge to income.

We recognize the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained upon examination by the taxing authorities based on the technical merits of our position. The tax benefit recognized in the financial statements for a particular tax position is based on the largest benefit that is more likely than not to be realized. The amount of unrecognized tax benefits is adjusted as appropriate for changes in facts and circumstances, such as significant amendments to existing tax laws, new regulations or interpretations by the taxing authorities, new information obtained during a tax examination, or resolution of an examination. We recognize both accrued interest and penalties associated with uncertain tax positions as a component of provision for income taxes in the consolidated statements of operations.

The application of tax laws and regulations is subject to legal and factual interpretation, judgment and uncertainty. Tax laws and regulations may change as a result of changes in fiscal policy, changes in legislation, the evolution of regulations and court rulings. Therefore, the actual liability for U.S. or foreign taxes may be materially different from our estimates, which could require us to record additional tax liabilities or to reduce previously recorded tax liabilities, as applicable.

Recent Accounting Pronouncements

See Note 2 "Summary of Significant Accounting Policies" of the Notes to Consolidated Financial Statements in Part IV, Item 15 of this Form 10-K for further discussion

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Not applicable.

Item 8. Financial Statements and Supplementary Data

The information required by this item is incorporated herein by reference to our consolidated financial statements included in Part IV, Item 15. Exhibit and Financial Statements Schedules beginning on page F-2.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed by us in reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosures.

Our management conducted an evaluation, with the participation of our principal executive officer and principal financial officer, of the effectiveness of our disclosure controls and procedures as of the end of the period covered by this report. Based on this evaluation, our principal executive officer and our principal financial officer concluded that our disclosure controls and procedures were effective as of December 28, 2019.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting for our Company, as such term is defined in Rule 13a-15(f) under the Exchange Act. Our management conducted an evaluation, with the participation of our principal executive officer and principal financial officer, of the effectiveness of our internal control over financial reporting as of December 28, 2019, based on the criteria set forth in the *2013 Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management concluded that our internal control over financial reporting was effective as of December 28, 2019.

This report does not include an attestation report of our independent registered public accounting firm regarding our internal control over financial reporting, in accordance with applicable SEC rules that permit us to provide only management's report in this report.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the most recently completed fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Disclosure Controls and Procedures and Internal Control Over Financial Reporting

In designing our disclosure controls and procedures and internal control over financial reporting, management recognizes that any control system, no matter how well-designed and operated, can provide only reasonable, not absolute, assurance of achieving the desired control objectives. Further, the design of our controls and procedures must reflect the fact that there are resource constraints, and management necessarily applies its judgment in evaluating the benefits of possible controls and procedures relative to their costs. Because of the inherent limitations, our disclosure and internal controls may not prevent or detect all instances of fraud, misstatements or other control issues, and our evaluations of disclosure and internal controls cannot provide assurance that all such control issues have been detected.

In addition, projections of any evaluation of the effectiveness of disclosure or internal controls to future periods are subject to risks, including, among others, that controls may become inadequate because of changes in conditions or that compliance with policies or procedures may deteriorate.

Item 9B. Other Information

2020 Lincoln Park Purchase Agreement

On March 5, 2020, we entered into the 2020 Purchase Agreement with Lincoln Park, pursuant to which we have the right to sell to Lincoln Park up to $20 million in shares of our common stock, subject to certain limitations and conditions set forth in the Purchase Agreement.

Pursuant to the 2020 Purchase Agreement, on any business day and as often as every other business day over the 36-month term of the 2020 Purchase Agreement, and up to an aggregate of $20 million (subject to certain limitations) in shares of our common stock, we have the right, from time to time, at our sole discretion and subject to certain conditions to direct Lincoln Park to purchase up to 400,000 shares of our common stock, which amount can be increased under certain circumstances. The purchase price of shares of our common stock pursuant to the 2020 Purchase Agreement will be based on prevailing market prices of our common stock at the time of sales without any fixed discount, and we will control the timing and amount of any sales of our common stock to Lincoln Park, but in no event will Lincoln Park be required to purchase more than $1.0 million in shares of our common stock on any single regular purchase date (excluding an accelerated purchase request on such date). In addition, we may direct Lincoln Park to purchase additional amounts as accelerated purchases under certain circumstances.

All shares of our common stock to be issued and sold to Lincoln Park under the 2020 Purchase Agreement will be issued pursuant to our effective shelf registration statement on Form S-3 (Registration No. 333-228348), filed with the SEC in accordance with the provisions of the Securities Act, and declared effective on November 28, 2018, and the prospectus supplement thereto dated March 9, 2020. Based on the number of shares of our common stock authorized as of the date of the 2020 Purchase Agreement, unless the trading price of our common stock increases substantially, we will not be able to utilize all of the capacity of the equity line financing unless we increase the total number of our authorized shares, which would require the approval of a majority of our outstanding shares voting at a duly convened stockholder meeting. Seeking such approval could be costly, time-consuming and unsuccessful.

The 2020 Purchase Agreement contains customary representations, warranties and agreements of us and Lincoln Park, limitations and conditions to completing future sale transactions, indemnification rights and other obligations of the parties. There is no upper limit on the price per share that Lincoln Park could be obligated to pay for our common stock under the 2020 Purchase Agreement. We have the right to terminate the 2020 Purchase Agreement at any time, at no cost or penalty. Actual sales of shares of our common stock to Lincoln Park under the 2020 Purchase Agreement will depend on a variety of factors to be determined by us from time to time, including (among others) market conditions, the trading price of our common stock and determinations by us as to available and appropriate sources of funding for us and our operations. As consideration for entering into the 2020 Purchase Agreement, we issued to Lincoln Park 1,529,052 shares of our common stock on March 6, 2020, and up to 917,431 additional shares of our common stock on a pro rata basis as Lincoln Park purchases up to $20 million in shares of our common stock in our discretion under the 2020 Purchase Agreement over the term of the 2020 Purchase Agreement. We will not receive any cash proceeds from the issuance of these 1,529,052 shares or the 917,431 shares that may be issued if we receive subsequent funding.

This shall not constitute an offer to sell or a solicitation of an offer to buy any shares of our common stock, nor shall there be any sale of shares of our common stock in any state or jurisdiction in which such an offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such state or other jurisdiction.

The 2020 Purchase Agreement is filed as Exhibit 10.37 to this Form 10-K and incorporated herein by reference. The foregoing descriptions of such agreement and the transactions contemplated thereby are qualified in their entirety by reference to such exhibits. In addition, the 2020 Purchase Agreement has been included to provide investors with information regarding its terms. The 2020 Purchase Agreement is not intended to provide any other factual information about us. The 2020 Purchase Agreement contains representations and warranties that we have made to Lincoln Park. The assertions embodied in those representations and warranties are qualified by information in confidential disclosure schedules that we have provided to Lincoln Park in connection with signing the 2020 Purchase Agreement. The

disclosure schedules may contain information that modifies, qualifies and creates exceptions to the representations and warranties set forth in the 2020 Purchase Agreement. Accordingly, investors should not rely on the representations and warranties as characterizations of the actual state of facts at the time they were made or otherwise.

Amendment to SVB Loan and Security Agreement

On February 27, 2020, we entered into an amendment to a credit agreement dated October 31, 2009 with Silicon Valley Bank ("SVB") (the "SVB Credit Agreement") to extend the maturity date of the borrowings under the SVB Credit Agreement from March 30, 2020 to April 30, 2021.

Compensation Adjustments

On March 6, 2020, our Compensation Committee of the Board of Directors approved compensation for our two named executive officers beginning calendar year 2020. The Compensation Committee approved a base salary of $450,000 per annum for Chun K. Hong, our Chief Executive Officer, and $275,000 per annum for Gail Sasaki, our Chief Financial Officer. In making this determination, the Compensation Committee considered that both officers had held their positions since our initial public offering in 2006 and that Mr. Hong had not received an increase in his base salary for 13 years and Ms. Sasaki had not received any increase in her base salary for 10 years. In its deliberations regarding the adjustments to base salary, the Compensation Committee considered the cost of living increases in the United States, California and Orange County, California during the period since the initial public offering as calculated according to various government and private publications. The final determination of base salary levels was made after considering the range of calculations as well as a number of other factors that the Compensation Committee determined to be relevant in the exercise of its business judgment. The Compensation Committee also established bonus targets for the officers of 100% of base salary dependent upon achieving agreed financial objectives. Finally, the Compensation Committee approved awards of 300,000 restricted stock units for Mr. Hong and 75,000 restricted stock units for Ms. Sasaki, subject to four-year vesting.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Each member of our Board of Directors (referred to as our "Board" or "Board of Directors") is elected annually at a meeting of our stockholders and serves for a one-year term until the next annual meeting of our stockholders and until his or her successor is elected and qualified, or until an earlier resignation or removal. Each of our executive officers is appointed by, and serves at the direction of, our Board, subject to the terms of our employment agreement with our President and Chief Executive Officer, which is described under "Employment Agreements" in Item 11 of this Form 10-K, and which establishes, among other things, such executive officer's term of office.

The table and narrative below provide, for our current directors and executive officers, each such individual's name; age as of March 3, 2020; current position(s) with our Company; tenure in such position(s); information about such individual's business experience and qualifications, including principal occupation or employment and principal business of the employer, if any, for at least the past five years, and involvement in certain legal or administrative proceedings, if any; and, for each of our directors, other public company director positions held currently or at any time in the last five years and the experiences, qualifications, attributes and skills that led to the conclusion that such individual should serve as a director of our Company. Additionally, for each of our directors, and in addition to each such individual's specific qualifications and skills described below, we believe each such individual brings a strong and unique background and set of skills to our Board of Directors, which gives our Board competence and experience in a wide variety of areas, including corporate governance and board service, executive management, financial reporting, law and regulation, the memory systems market, the semi-conductor industry, licensing, and worldwide customer and manufacturer management. There is no arrangement or understanding between any director or executive officer and any other person(s) pursuant to which such director or executive officer was or is to be selected as a director or executive officer of our Company, and there are no family relationships between any of our directors or executive officers.

Name	Age	Position(s)
Chun K. Hong	59	President, Chief Executive Officer and Chairman of the Board
Jun S. Cho	60	Lead Independent Director
Kiho Choi	64	Director
Blake A. Welcher	58	Director
Gail Sasaki	63	Vice President, Chief Financial Officer and Secretary

Chun K. Hong is one of the founders of Netlist and has been our President and Chief Executive Officer and a director since our inception in June 2000. Mr. Hong assumed the title of Chairman of the Board of Directors in January 2004. Prior to his tenure at Netlist, Mr. Hong has served in various other executive positions including President and Chief Operating Officer of Infinilink Corporation, a DSL equipment company, as Executive Vice President of Viking Components, Inc., a memory subsystems manufacturing company, and as General Manager of Sales at LG Semicon Co., Ltd., a public semiconductor manufacturing company in South Korea. Mr. Hong received his Bachelor of Science degree in economics from Virginia Commonwealth University and his Master of Science degree in technology management from Pepperdine University's Graduate School of Management. As one of our founders and as our Chief Executive Officer, Mr. Hong brings to the Board extensive knowledge of our organization and our market.

Jun S. Cho joined the Netlist Board in November 2014 and became the Lead Independent Director of the Board in December 2017. Mr. Cho currently serves as General Counsel to Fiat Chrysler Automobiles ("FCA") Asia Pacific and Vice President and Assistant General Counsel to FCA US LLC (formerly, Chrysler Group LLC), a global automobile company. Mr. Cho has more than 19 years of experience as legal counsel for the FCA and over 12 years of experience in the Asia Pacific region leading FCA's initiatives in technology licensing, product distribution, M&A transactions and joint ventures, from his bases in Beijing and Shanghai. Prior to FCA, Mr. Cho specialized in international financing and corporate transactions working for global-reaching law firms including Debevoise & Plimpton in New York, Kim & Chang in Seoul, Korea and Arnold & Porter in Washington D.C. Mr. Cho holds a Juris Doctorate degree from the New York University School of Law and is admitted to the bar in the state of New York and in Washington D.C. He received his undergraduate degree in economics from the College of William and Mary. Mr. Cho brings to Netlist's Board of Directors his considerable legal background and extensive experience with complex organizations and transactions.

Kiho Choi joined the Netlist Board in May 2017. In 2005, Mr. Choi established CKP, LLP (formerly, Choi, Kim & Park, LLP), the largest Korean American full service CPA firm in the United States, and is currently the Managing Partner of the firm. In this role, Mr. Choi is responsible for directing the publicly-held and international company audit service and management and financing consulting practices of the firm. Mr. Choi also currently serves on the Board of Directors of Hanmi Financial Corporation and Hanmi Bank. Mr. Choi began his public accounting career in 1989 in the Assurance and Consulting Division of Watkins, Meegan, Drury & Co, LLC in Washington D.C., a full service regional accounting and consulting firm specializing in government, financial institutions, and non-profit organizations. As a director in-charge of the resolution services division, Mr. Choi had responsibility for auditing banks and government contractors and worked closely with Resolution Trust Corporation and Federal Deposit Insurance Corporation. In 1995, Mr. Choi joined Kim & Lee, LLP, a Korean-American CPA firm, as a partner responsible for the firm's audit and consulting practice. Mr. Choi is a graduate of the University of Illinois, at Chicago, receiving both a Bachelor and Master of Science degrees in Accounting. Mr. Choi brings to Netlist's Board of Directors his significant accounting and financial expertise, as well as his extensive senior management experience.

Blake A. Welcher joined the Netlist Board in August 2013. Mr. Welcher currently serves as Vice President, Legal (previously General Counsel) for PSI Services LLC, an assessment and testing development and administration company. Mr. Welcher served as Executive Vice President, General Counsel and Corporate Secretary of DTS, Inc. ("DTS"), a consumer electronics company, until December 2016, when DTS was sold to Tessera Technologies. Mr. Welcher had been a member of the DTS executive team since March 2000. As General Counsel at DTS, he managed the licensing operations and was instrumental in building key assets that have led to DTS' success. Mr. Welcher led DTS' legal licensing functions, collaborated with key partners and worked to establish DTS as a global name in consumer electronics. Mr. Welcher holds a bachelor's degree in Aeronautical Engineering from California Polytechnic State University at San Luis Obispo, a Juris Doctorate and Masters of Intellectual Property degree from Franklin Pierce Law Center (University of New Hampshire School of Law) and is a U.S. licensed Patent Attorney. Mr. Welcher brings more than 20 years of industry experience to Netlist's Board of Directors with his extensive background in worldwide licensing operations, corporate governance, risk management, intellectual property and legal affairs.

Gail Sasaki has been our Vice President and Chief Financial Officer since January 2008 and our Secretary since August 2007. From 2006 to January 2008, Ms. Sasaki served as our Vice President of Finance. Prior to her tenure at Netlist, Ms. Sasaki served in various senior financial roles, including Chief Financial Officer of eMaiMai, Inc., a commercial technology company based in Hong Kong and mainland China; Chief Financial Officer, Senior Vice President of Finance, Secretary and Treasurer of eMotion, Inc. (a Kodak subsidiary and formerly Cinebase Software), a developer of business-to-business media management software and services, and Chief Financial Officer of MicroNet Technology, Inc., a leader in storage technology. Ms. Sasaki also spent seven years in public accounting leaving as an audit manager with Arthur Young (now known as Ernst &Young LLP). Ms. Sasaki earned a Bachelor's degree from the University of California at Los Angeles, and also earned a Master of Business Administration degree from the University of Southern California.

Board Committees

Our Board has a standing Audit Committee, Compensation Committee, and Nominating and Corporate Governance Committee, each of which is described below and operates pursuant to a written charter adopted by our Board and available on our website (www.netlist.com). The table below shows the membership of these committees during our fiscal year ended December 28, 2019 and our current fiscal year ending December 26, 2020 to date. Our 2018 fiscal year ended December 29, 2018. Our Board may also create additional committees from time to time, including committees relating to pending litigation proceedings or other significant corporate matters or committees to approve financing or other strategic transactions.

Name	Audit(1)	Compensation(2)	Nominating and Corporate Governance(3)
Jun S. Cho	•		•
Kiho Choi (4)	Chair	•	
Blake A. Welcher	•	Chair	Chair

(1) Messrs. Choi (Chair), Cho and Welcher have served on this committee at all times during 2019 and 2020 to date.
(2) Messrs. Welcher (Chair) and Choi have served on this committee at all times during 2019 and 2020 to date.
(3) Messrs. Welcher (Chair) and Cho have served on this committee at all times during 2019 and 2020 to date.
(4) Our Board has determined that Mr. Choi qualifies as an "audit committee financial expert" in accordance with applicable SEC rules.

Audit Committee

The primary functions of our Audit Committee are, among other things, to:

- oversee our financial reporting process, including discussing with our independent registered public accounting firm the scope and plans for all annual audits and discussing with management and our independent registered public accounting firm the adequacy and effectiveness of our accounting and financial controls, systems to monitor and manage business risk, and legal and ethical compliance programs;
- review with management and our independent registered public accounting firm all of our audited and interim financial statements;
- review and approve in advance any transactions by us with related parties;
- appoint, terminate, replace, ensure the independence of and oversee our independent registered public accounting firm;
- pre-approve all audit services and, subject to a "de minimus" exception, all permissible non-audit services to be performed by the independent registered public accounting firm;
- be responsible for setting the corporate tone for quality financial reporting and sound business risk practices and ethical behavior; and
- establish procedures for the confidential and anonymous submission, receipt, retention and treatment of concerns or complaints regarding accounting, internal accounting controls and auditing matters.

Compensation Committee

The primary functions of our Compensation Committee are, among other things, to:

- review and approve, or make recommendations to the Board regarding, our programs and arrangements for our Section 16 executive officers, including salary, incentive compensation, equity compensation and perquisite programs;
- review the evaluation process and compensation structure for our non-Section 16 executive officers;
- assist the Board in developing and evaluating potential candidates for executive positions and oversee the development of executive succession plans; and
- review and act as administrator of our incentive compensation and other stock-based plans.

Nominating and Corporate Governance Committee

The primary functions of our Nominating and Corporate Governance Committee are, among other things, to:

- lead the search for individuals qualified to become members of the Board and select director nominees to be presented at our annual meetings of stockholders;
- review the standards to be applied by the Board in making determinations as to whether a director satisfies applicable independence requirements;

- review the Board's structure and the Board's committee structure and make recommendations as appropriate, including recommending to the Board the directors to serve as members of each Board committee;
- conduct an annual performance evaluation of the Board and its committees;
- advise the Board on candidates for the positions of Chairman of the Board, Lead Independent Director, Chief Executive Officer and other executive officer positions;
- develop, recommend to the Board and review a set of corporate governance guidelines and a code of business conduct and ethics; and
- review changes in legislation, regulations and other developments impacting corporate governance and make recommendations to the Board with respect to these matters and corporate governance matters generally.

Code of Business Conduct and Ethics

Our Board has adopted a Code of Business Conduct and Ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, as well as all of our other executive officers and employees and all of our directors. Shareholders may download a free copy of our Code of Business Conduct and Ethics from our website (www.netlist.com). We intend to disclose on our website any amendments to or waivers from this code by posting the relevant material on our website (www.netlist.com) in accordance with SEC rules.

Item 11. Executive Compensation

Executive Compensation

The table below provides information about the compensation awarded to, earned by or paid to each of the following individuals, which we refer to collectively as our "named executive officers," for 2019 and 2018: each person serving at any time during 2019 as our principal executive officer (our President and Chief Executive Officer, Mr. Hong); and our only other executive officer serving as such at any time during 2019 (our Vice President, Chief Financial Officer and Secretary, Ms. Sasaki).

Summary Compensation Table

Name and Principal Position	Year	Base Salary($)	Stock Awards($)(1)	All Other Compensation($)(2)	Total($)
Chun K. Hong	2019	323,000	408,004	51,486	782,489
President and Chief Executive Officer	2018	323,000	75,780	47,328	446,108
Gail Sasaki	2019	200,000	223,992	—	423,992
Vice President, Chief Financial Officer and Secretary	2018	200,000	18,945	1,385	220,330

(1) Represents the grant date fair value of the restricted stock ("RSAs") and restricted stock units ("RSUs") granted during the year calculated in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718, Compensation—Stock Compensation ("ASC 718"). The grant date fair value was determined using the fair value of the underlying shares of our common stock.

(2) For 2019, the amount consists of $10,936 for automobile rental payments, $8,694 for other vehicle-related costs, $22,052 for a country club membership, $4,532 for a health club membership, and $5,272 for income tax and estate planning costs incurred on Mr. Hong's behalf. For 2018, the amount consists of (a) for Mr. Hong, $15,816 for automobile rental payments, $3,554 for other vehicle-related costs, $21,302 for a country club membership, $2,482 for a health club membership, and $4,174 for income tax and estate planning costs incurred on Mr. Hong's behalf, and (b) for Ms. Sasaki, the amount of our matching contributions under our savings plan qualified under Section 401(k) of the Internal Revenue Code (the "Code").

Employment Agreements

We entered into an employment agreement with our President and Chief Executive Officer, Mr. Hong, in September 2006. This agreement provides for an initial base salary of $323,000 plus other specified benefits, including the reimbursement of professional fees and expenses incurred in connection with income and estate tax planning and preparation, income tax audits and the defense of income tax claims; the reimbursement of membership fees and expenses for professional organizations and one country club; the reimbursement of employment-related legal fees; automobile rental payments and other vehicle-related expenses; and the reimbursement of health club membership fees and other similar health-related expenses. Mr. Hong may earn annual cash performance bonuses, at the discretion of our Compensation Committee or our Board, of up to 100% of his base salary based upon the achievement of individual and Company performance objectives.

Mr. Hong's employment agreement automatically renews for additional one-year periods unless we provide or Mr. Hong provides notice of termination six months prior to the renewal date, but at all times Mr. Hong may terminate his employment upon six months' advance written notice to us and we may terminate Mr. Hong's employment upon 30 days' advance written notice to Mr. Hong. If we terminate Mr. Hong's employment without cause or if he resigns from his employment for good reason, which includes a termination or resignation upon a change of control of our Company, Mr. Hong would be entitled to receive continued payments of his base salary for one year, reimbursement of medical insurance premiums during that period unless he becomes employed elsewhere, a pro-rated portion of his annual performance bonus, and, if any severance payment is deemed to be an "excess parachute payment" within the meaning of Section 280G of the Code, an amount equal to any excise tax imposed under Section 4999 of the Code. In addition, upon any such termination or resignation, any unvested stock options held by Mr. Hong would immediately become fully vested and exercisable as of the effective date of the termination or resignation. If Mr. Hong's employment is terminated due to death or disability, he or his estate would receive a lump-sum payment equal to half of his annual base salary and any stock options held by Mr. Hong would vest to the same extent as they would have vested one year thereafter. Additionally, if Mr. Hong's employment is terminated due to death or disability, 25% of the shares subject to outstanding stock options, or such lesser amount as is then unvested, would immediately vest and become exercisable. If Mr. Hong resigns without good reason or is terminated for cause, we would have no further obligation to him other than to pay his base salary or other amounts earned by him through the date of resignation or termination.

For purposes of Mr. Hong's employment agreement:

- "cause" means a reasonable determination by the Board, acting in good faith based upon actual knowledge at the time, that Mr. Hong has (i) materially breached the terms of his employment agreement, or any other material agreement between us and Mr. Hong, including an arbitration agreement and a proprietary information and invention assignment agreement, (ii) committed gross negligence or engaged in serious misconduct in the execution of his assigned duties, (iii) been convicted of a felony or other serious crime involving moral turpitude, (iv) materially refused to perform any lawful duty or responsibility consistent with Mr. Hong's position with our Company, or (v) materially breached his fiduciary duty or his duty of loyalty to our Company;
- "good reason" means (i) the assignment to Mr. Hong, without his consent, of duties inconsistent with his position so as to constitute a diminution of status with our Company, including an assignment of Mr. Hong to a position other than President and Chief Executive Officer of our Company, (ii) our reduction of Mr. Hong's base salary as in effect at any time without Mr. Hong's consent, other than a decrease of up to (and including) 10% in connection with an adverse change in the business operations or financial condition of our Company, (iii) the occurrence of a change of control, or (iv) a requirement that Mr. Hong relocate (or report on a regular basis) to an office outside of Orange County without his consent; and
- a "change of control" means the occurrence of any of the following: (i) any person or entity is or becomes the beneficial owner (within the meaning of Rule 13d-3 under the Exchange Act), directly or indirectly, of securities of our Company representing a percentage of the combined voting power of our then-outstanding securities that is greater than 50%, (ii) the following individuals cease for any reason to constitute a majority of the number of directors then serving: individuals who, on the date of Mr. Hong's employment agreement, constituted our Board and any new director (other than a director whose initial assumption of office is in connection with an actual or threatened election contest, including but not limited to a consent

solicitation, relating to the election of directors of our Company) whose appointment or election by the Board or nomination for election by our stockholders is approved or recommended by a vote of at least two-thirds of the directors then still in office who either were directors on the date of Mr. Hong's employment agreement or whose appointment, election or nomination for election was previously so approved or recommended; (iii) there is consummated a merger or consolidation of our Company in which our Company does not survive or our Company survives but the shares of our common stock outstanding immediately prior to such merger or consolidation represent 50% or less of the voting power of our Company after such merger or consolidation; or (iv) our stockholders approve a plan of our complete liquidation or dissolution or there is consummated an agreement for our sale or disposition of all or substantially all of our assets, other than a sale or disposition of all or substantially all of our assets to an entity, at least 50% of the combined voting power of the voting securities of which are owned by our stockholders in substantially the same proportions as their ownership of our Company immediately prior to such sale.

We have not entered into an employment agreement with Ms. Sasaki, our Vice President, Chief Financial Officer and Secretary. For 2019 and 2018, Ms. Sasaki received an annualized base salary of $200,000. If Ms. Sasaki's employment is terminated due to death or disability, any stock options held by Ms. Sasaki would vest to the same extent as they would have vested one year thereafter. Additionally, if Ms. Sasaki's employment is terminated due to death or disability, 25% of the shares subject to outstanding stock options, or such lesser amount as is then unvested, would immediately vest and no additional shares would vest thereafter. Ms. Sasaki is eligible for a target cash bonus of 75% of her base salary, which is to be determined by our Board in its discretion based on various factors.

Cash Bonuses

No cash bonuses were paid to either Mr. Hong or Ms. Sasaki for 2019 and 2018.

Retirement Benefits

We maintain a savings plan that qualifies as a defined contribution plan under Section 401(k) of the Code, to which all of our employees, including our named executive officers, are able to contribute up to the limit prescribed by applicable tax rules on a before-tax basis. All of these employee contributions are fully-vested upon contribution. In addition, we may make matching contributions on the contributions of our employees on a discretionary basis, and in 2018, we made matching contributions equal to 50% of the first 6% of pay that was contributed by employees, including our named executive officers, to the plan. Effective for pay periods beginning April 15, 2018, we no longer make these matching contributions.

Outstanding Equity Awards at Fiscal Year End

The following table shows information about the equity awards held by our named executive officers as of December 28, 2019:

		Option Awards				Stock Awards	
Name	Grant Date	Number of Securities Underlying Unexercised Options Exercisable(#)(1)	Number of Securities Underlying Unexercised Options Unexercisable(#)(1)	Option Exercise Price($)	Option Expiration Date	Number of Shares That Have Not Vested(#)(2)	Market Value of Shares That Have Not Vested($)(2)
Chun K. Hong	3/17/2011	300,000	—	2.21	3/17/2021	—	—
	2/27/2012	300,000	—	3.59	2/27/2022	—	—
	2/11/2013	300,000	—	0.71	2/11/2023	—	—
	2/21/2014	300,000	—	2.05	2/21/2024	—	—
	1/6/2015	300,000	—	0.84	1/6/2025	—	—
	1/8/2016	281,250	18,750	0.70	1/18/2026	—	—
	2/14/2017	131,250	93,750	1.02	2/14/2027	—	—
	4/13/2018	—	—	—	—	150,000	47,820
	3/7/2019	—	—	—	—	649,687	207,120
Gail Sasaki	3/17/2011	75,000	—	2.21	3/17/2021	—	—
	2/27/2012	75,000	—	3.59	2/27/2022	—	—
	2/11/2013	75,000	—	0.71	2/11/2023	—	—
	2/21/2014	75,000	—	2.05	2/21/2024	—	—
	1/6/2015	75,000	—	0.84	1/6/2025	—	—
	1/18/2016	70,312	4,688	0.70	1/18/2026	—	—
	2/14/2017	51,562	23,438	1.02	2/14/2027	—	—
	4/13/2018	—	—	—	—	37,500	11,955
	3/18/2019	—	—	—	—	360,281	114,858

(1) Represents stock option awards granted under the Netlist, Inc. Amended and Restated 2006 Equity Incentive Plan (the "Equity Plan"). These stock option awards that are not fully exercisable vest in 16 equal quarterly installments, subject to continued service on each vesting date, subject to accelerated vesting in certain circumstances as described under "Employment Agreements" above.

(2) Represents RSAs and RSUs granted under the Equity Plan. Restrictions on the RSAs lapse equally on the first and second anniversaries of their grant date. Restrictions on RSUs lapse in eight equal semi-annual installments from the grant date.

2020 Compensation Adjustments

On March 6, 2020, our Compensation Committee approved compensation for our two named executive officers beginning calendar year 2020. The Compensation Committee approved a base salary of $450,000 per annum for Chun K. Hong, our Chief Executive Officer, and $275,000 per annum for Gail Sasaki, our Chief Financial Officer. In making this determination, the Compensation Committee considered that both officers had held their positions since our initial public offering in 2006 and that Mr. Hong had not received an increase in his base salary for 13 years and Ms. Sasaki had not received any increase in her base salary for 10 years. In its deliberations regarding the adjustments to base salary, the Compensation Committee considered the cost of living increases in the United States, California and Orange County, California during the period since the initial public offering as calculated according to various government and private publications. The final determination of base salary levels was made after considering the range of calculations as well as a number of other factors that the Compensation Committee determined to be relevant in the exercise of its business judgment. The Compensation Committee also established bonus targets for the officers of 100% of base salary dependent upon achieving agreed financial objectives. Finally, the Compensation Committee approved awards of 300,000 restricted stock units for Mr. Hong and 75,000 restricted stock units for Ms. Sasaki, subject to four-year vesting.

Director Compensation

Non-Employee Director Compensation

Our non-employee directors receive annual cash compensation of $30,000, which is paid in four equal quarterly installments, and additional cash payments of $1,000 for each regularly scheduled Board meeting and each Board committee meeting not held on the same day as a Board meeting that is attended by the director. The Lead Independent Director and the Chair of our Audit Committee each receive additional cash compensation of $5,000 per year. All of our directors, including our non-employee directors, are also reimbursed for their reasonable out-of-pocket expenses incurred in attending Board and Board committee meetings.

In addition, each of our non-employee directors is granted a stock option award to purchase up to 25,000 shares of our common stock upon his or her initial appointment or election to the Board, and a stock option award to purchase up to 20,000 shares of our common stock each year in which he or she continues to serve as a director. For awards granted to non-employee directors before 2017, all stock options vest in 16 equal quarterly installments, and for awards granted to non-employee directors in 2017 and thereafter, all stock options vest in one installment on the, earlier of, the one-year anniversary of the award or the day prior to the next annual shareholders meeting, in all cases subject to continued service on each vesting date. All stock option awards granted to non-employee directors are granted under our equity compensation plans then in effect and have an exercise price equal to the fair market value of our common stock on the grant date of the award.

Directors who are our employees receive no additional compensation for their service as directors.

Director Compensation Table

The following table shows the compensation of our non-employee directors for 2019. Mr. Hong, our President and Chief Executive Officer, is not included in this table because he is an employee of our Company and receives no additional compensation for his service as a director. The compensation received by Mr. Hong as an employee of our Company is described in this Item 11 above.

Name	Fees Earned or Paid in Cash($)	Stock Awards($)(1)	Total($)(2)
Jun S. Cho	43,004	59,840	102,844
Kiho Choi	45,004	54,400	99,404
Blake A. Welcher	40,000	70,720	110,720

(1) Represent the grant-date fair value of RSUs granted on March 18, 2019 calculated in accordance with ASC 718. The grant-date fair value was determined using the fair value of the underlying shares of our common stock. These RSUs fully-vested on the grant date.

(2) As of December 28, 2019, each individual named in the table held stock options to purchase the following number of shares of our common stock: (i) Mr. Cho, 105,000; (ii) Mr. Choi, 45,000; and (iii) Mr. Welcher, 125,000.

Equity Compensation Plans

We currently maintain one equity incentive plan, the Equity Plan. The Equity Plan initially became effective in 2006, was amended and restated in 2010, 2016 and 2019. Our Board and, when required, our stockholders have previously approved the Equity Plan, including all amendments and restatements of such plan. The terms of the Equity Plan are summarized below.

Share Reserve and Share Limits

Each January 1, the number of shares reserved for issuance under the Equity Plan will continue to be automatically increased by the lesser of (i) 2.5% of the shares then issued and outstanding, or (ii) 1,200,000 shares. As of

March 3, 2020, there were 15,005,566 total shares reserved for issuance under the Equity Plan, including 9,516,811 shares subject to outstanding equity awards granted under this plan.

Any shares subject to an award or portion of an award which is forfeited, canceled or expired shall be deemed not to have been issued for purposes of determining the maximum aggregate number of shares which may be issued under the Equity Plan. Shares that have been issued under the Equity Plan pursuant to an award generally shall not be returned to the reserve under the Equity Plan and shall not become available for future issuance under the Equity Plan, except that if unvested shares are forfeited, or repurchased by us at the lower of their original purchase price or their fair market value at the time of repurchase, such shares shall become available for future grant under the Equity Plan. Shares tendered or withheld in payment of an option exercise price shall not be returned to or become available for future issuance under the Equity Plan.

The maximum number of shares with respect to which options and stock appreciation rights may be granted to a participant during a calendar year is 1,000,000 shares (with an additional 1,000,000 shares of stock in connection with the participant's initial employment). For awards of restricted stock, restricted stock units, and performance units that are intended to be performance-based compensation under Section 162(m) of the Code, the maximum number of shares granted to a participant during a calendar year is 1,000,000 shares.

Administration

The Equity Plan is administered, with respect to grants of awards to employees, directors, officers, and consultants, by the administrator, which is defined as the Board or one or more committees designated by the Board. With respect to grants to officers and directors, the committee shall be constituted in such a manner as to satisfy applicable laws, including Rule 16b-3 under the Exchange Act and Section 162(m) of the Code. The Equity Plan is administered by the Compensation Committee of our Board, the composition of which satisfies such tax and SEC rules, subject to such committee's delegation to management to grant awards to certain eligible persons of up to 25,000 shares.

Eligibility

Persons eligible to receive awards under the Equity Plan include directors, officers and other employees of and consultants and advisors to our Company or any of our subsidiaries. As of December 28, 2019, approximately 70 officers and other employees of our Company and our subsidiaries (including all of the named executive officers) and each of our three non-employee directors are eligible to receive awards under the Equity Plan.

Vesting

Although the Equity Plan provides the administrator with the discretion to determine the vesting schedule of any awards granted under the plan, stock option awards granted to employees under the Equity Plan typically vest over four years in either 16 equal quarterly installments or one installment of 25% of the shares subject to the award on the one-year anniversary of the grant date and 12 equal quarterly installments thereafter, subject to continued service on each vesting date. RSAs granted to employees under the Equity Plan vest annually on each anniversary of the grant date over a two-year term, and RSUs granted for employees and consultants under the Equity Plan typically vest semi-annually from the grant date over a four-year term, subject to continued service on each vesting date. RSUs granted for independent directors under the Equity Plan fully-vest on the grant date.

Adjustments Upon Corporate Transactions

The Equity Plan provides that, in the event of an "acquisition," as defined in the Equity Plan, the administrator may provide for the termination of outstanding awards under the Equity Plan, unless awards are assumed or replaced by the successor entity in the acquisition. Except as provided in an individual award agreement, for the portion of each award that is not assumed or replaced by the successor entity, such portion of the award may be vested and become exercisable in full or be released from any repurchase or forfeiture rights before the effective date of the acquisition, provided that the participant's continuous service has not terminated before such date.

Amendment, Suspension and Termination

The Equity Plan will be for a term of 10 years from its 2016 amendment and restatement, unless sooner terminated by the Board. The Board may at any time amend, suspend or terminate the Equity Plan, subject to obtaining stockholder approval for any amendment to the extent necessary to comply with applicable laws and rules.

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

Security Ownership of Certain Beneficial Owners and Management

The table below sets forth information regarding the ownership of our common stock, as of March 3, 2020 (the "Table Date") unless otherwise indicated in the footnotes to the table, by (i) all persons known by us to beneficially own more than 5% of our common stock, (ii) each of our current directors, (iii) each of our named executive officers, and (iv) all of our directors and executive officers as a group. Unless otherwise indicated, each person named below possesses sole voting and investment power over all shares of common stock shown as beneficially owned by such person. Unless otherwise indicated, the address for each person named below is c/o Netlist, Inc., 175 Technology Drive, Suite 150, Irvine, CA 92618.

Name of Beneficial Owner	Shares Beneficially Owned	Percent of Class(1)
Chun K. Hong (2)	11,461,822	6.7%
Gail Sasaki (3)	696,983	*
Jun S. Cho (4)	410,500	*
Kiho Choi (5)	145,000	*
Blake A. Welcher (6)	255,000	*
All executive officers and directors as a group (5 persons) (7)	12,969,305	7.5%

* Represents beneficial ownership of less than 1%.

(1) All ownership percentages are based on 169,500,899 shares of our common stock outstanding as of the Table Date.

(2) Represents (i) 2,025,000 shares of common stock issuable upon the exercise of stock options that are or will be vested and exercisable within 60 days after the Table Date, (ii) 9,194,009 outstanding shares of common stock, of which 9,858,208 shares are held by Mr. Hong and his wife, Won K. Cha, as co-trustees of the Hong-Cha Community Property Trust. Mr. Hong and Ms. Cha possess shared voting and investment power over the shares of common stock held by the Hong-Cha Community Property Trust, and each disclaims beneficial ownership of such shares except to the extent of his or her pecuniary interest therein, (iii) 150,000 shares issuable within 60 days of the Table Date upon vesting of RSAs and (iv) 92,813 shares issuable within 60 days of the Table Date upon vesting of RSUs.

(3) Represents (i) 506,250 shares of common stock issuable upon the exercise of stock options that are or will be vested and exercisable within 60 days after the Table Date, (ii) 101,764 outstanding shares of common stock, (iii) 37,500 shares issuable within 60 days of the Table Date upon vesting of RSAs and (iv) 51,469 shares issuable within 60 days of the Table Date upon vesting of RSUs.

(4) Represents 105,000 shares of common stock issuable upon the exercise of stock options that are or will be vested and exercisable within 60 days after the Table Date, 305,500 outstanding shares of common stock, of which 175,500 are held in 401(k) and other investment accounts.

(5) Represents 45,000 shares of common stock issuable upon the exercise of stock options that are vested and exercisable within 60 days after the Table Date and 100,000 outstanding shares of common stock.

(6) Represents 125,000 shares of common stock issuable upon the exercise of stock options that are or will be vested and exercisable within 60 days after the Table Date and 130,000 outstanding shares of common stock.

(7) Represents (i) 2,806,250 shares of common stock issuable upon the exercise of stock options that are or will be vested and exercisable within 60 days after the Table Date, (ii) 9,831,273 outstanding shares of common stock, (iii) 187,500 shares issuable within 60 days of the Table Date upon vesting of RSAs and (iv) 144,282 shares issuable within 60 days of the Table Date upon vesting of RSUs.

Securities Authorized for Issuance under Equity Compensation Plans

The following table provides information as of December 28, 2019 about compensation plans under which our equity securities are authorized for issuance:

	Equity Compensation Plan Information		
Plan Category	**Number of securities to be issued upon exercise of outstanding options, warrants and rights**	**Weighted-average exercise price of outstanding options, warrants and rights($) (1)**	**Number of securities remaining available for future equity compensation plans**
Equity compensation plans approved by security holders	10,422,437(2)	1.17	1,101,572(3)
Equity compensation plans not approved by security holders	800,000(4)	0.22	—
Total	11,222,437	1.10	1,101,572

(1) The weighted-average exercise price is calculated based solely on the exercise prices of the outstanding options and do not reflect the shares that will be issued upon the vesting of outstanding awards of RSAs and RSUs, which have no exercise price.

(2) This number includes the following outstanding awards granted under the Equity Plan: 7,356,758 shares subject to outstanding stock options, 262,500 shares subject to outstanding RSAs and 2,803,179 shares subject to outstanding RSUs.

(3) Subject to certain adjustments, as of December 28, 2019, we were authorized to issue a maximum of 13,805,566 shares of our common stock pursuant to awards granted under the Equity Plan.

(4) Consists of 800,000 stock option awards outstanding as of December 28, 2019.

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

Related Party Transactions

Except as described below and except for employment arrangements and compensation for Board service, which are described in Item 11 above, since December 31, 2017, there has not been, nor is there currently proposed, any transaction or series of transactions in which our Company was or is to be a participant, in which the amount involved exceeds the lesser of $120,000 or 1% of the average of our total assets at year-end for our last two completed fiscal years, and in which any director, officer or beneficial owner of more than 5% of our common stock, or member of any such person's immediate family, had or will have a direct or indirect material interest.

On May 21, 2018, a trust controlled by Chun K. Hong, our President, Chief Executive Officer and Chairman of the Board, purchased 5,405,405 shares of our common stock, par value $0.001 per share, at a price per share of $0.148 for $800,000 pursuant to a Board approved arm's length Share Purchase Agreement entered into with our Company on May 17, 2018.

Our Vice President of Netlist Base and Commodity Sales (formally, our Vice President of Operations), Paik K. Hong, is the brother of Chun K. Hong, our President, Chief Executive Officer and Chairman of the Board. For 2019, Mr. P. K. Hong earned cash salary of $225,001, cash bonus of $112,500 and was granted 411,750 shares of restricted stock units with grant-date fair value of $223,992 measured in accordance with ASC 718. For 2018, Mr. P. K. Hong earned cash salary of $200,000 and was granted 75,000 shares of restricted stock with grant-date fair value of $18,945 measured in accordance with ASC 718. The grant-date fair value was determined using the fair value of the underlying shares of our common stock. In March 2020, our Audit Committee approved the increase in his annual base salary to $250,000.

We have entered into indemnification agreements with each of our directors and executive officers. In general, these agreements require us to indemnify each such individual to the fullest extent permitted under Delaware law against certain liabilities that may arise by reason of their service for us, and to advance expenses incurred as a result of any such proceeding as to which any such individual could be indemnified.

Policies and Procedures for Review and Approval of Related Party Transactions

Pursuant to its written charter and in accordance with applicable Nasdaq rules, our Audit Committee is responsible for reviewing and approving in advance any transactions with a related party. The Audit Committee intends to approve only those related party transactions that are considered to be in the best interests of our Company and our stockholders. In considering whether to approve any transaction, the Audit Committee considers such factors as it deems appropriate, which may include: the related party's relationship with our Company and interest in the transaction; the material facts of the transaction, including the value of the transaction, or in the case of indebtedness, the principal amount that would be involved; the benefits of the transaction to our Company; an assessment of whether the transaction is on terms that are comparable to the terms that may be available in a similar transaction with an unrelated party; the impracticability or cost of securing alternative arrangements; and such other factors as the Audit Committee deems relevant.

Director Independence

Our common stock was listed on The Nasdaq Capital Market until September 27, 2018. On September 27, 2018, our common stock began trading on the OTCQX® Best Market. OTCQX® Best Market does not require that a majority of the board of directors be independent. Our Board has continued to consider the independence of our directors under the listing standards of The Nasdaq Capital Market.

Our Board has determined that each of our current directors and each of our directors serving at any time in 2019 and 2018, other than our President and Chief Executive Officer, Mr. Hong, is independent. In addition, our Board has determined that each director serving currently or at any time in 2019 and 2018 as a member of our Audit Committee, Compensation Committee or Nominating and Corporate Governance Committee were independent under the listing standards of The Nasdaq Capital Market.

Item 14. Principal Accounting Fees and Services

Fees Paid to Independent Registered Public Accounting Firm

The following table presents the aggregate fees billed to us by our independent registered public accounting firm, KMJ Corbin & Company LLP ("KMJ"), for the years ended December 28, 2019 and December 29, 2018:

	2019($)	2018($)
Audit Fees (1)	126,800	137,600
Audit-Related Fees (2)	—	—
Tax Fees (2)	—	—
All Other Fees (2)	—	—
Total Fees	126,800	137,600

(1) Audit fees consist of fees billed to us for professional services rendered for the audit of our annual consolidated financial statements and the review of our interim condensed consolidated financial statements included in our quarterly reports. These fees also include fees billed to us for professional services that are normally provided in connection with statutory and regulatory filings or engagements, including the review of our registration statements on Form S-3 and Form S-8 and certain other related matters, such as the delivery of comfort letters and consents in connection with these registration statements.

(2) KMJ did not bill to us any audit-related fees, tax fees or other fees in 2019 or 2018.

Pre-Approval Policies and Procedures

Our Audit Committee's charter requires our Audit Committee to pre-approve all audit and permissible non-audit services to be performed for us by our independent registered public accounting firm, except for certain "de minimus" non-audit services that may be ratified by the Audit Committee in accordance with applicable SEC rules, in order to assure that the provision of such services is compatible with maintaining the independence of our independent registered public accounting firm. Our Audit Committee pre-approved all services performed by KMJ in 2019 and 2018.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a)(1) **Consolidated Financial Statements.**

The following financial statements are included immediately following the signature page to this report and are filed in Part II, Item 8 of this report:

	Page
Report of Independent Registered Public Accounting Firm	F-2
Consolidated Balance Sheets	F-3
Consolidated Statements of Operations	F-4
Consolidated Statements of Stockholders' Deficit	F-5
Consolidated Statements of Cash Flows	F-6
Notes to Consolidated Financial Statements	F-7

(a)(2) **Financial Statement Schedules.**

All financial statement schedules have been omitted, as they are not required, not applicable, or the required information is otherwise included.

(a)(3) Exhibits.

EXHIBIT INDEX

			Incorporated by Reference			
Exhibit No.	**Description**	**Filed Herewith**	**Form**	**File No.**	**Exhibit**	**Filing Date**
3.1	Restated Certificate of Incorporation of Netlist, Inc.		10-Q	001-33170	3.1	August 15, 2017
3.1.1	Certificate of Amendment to the Restated Certificate of Incorporation of Netlist, Inc.		10-Q	001-33170	3.1.1	August 15, 2017
3.1.2	Certificate of Amendment of the Restated Certificate of Incorporation of Netlist, Inc.		8-K	001-33170	3.1	August 17, 2018
3.1.3	Certificate of Designation of the Series A Preferred Stock of Netlist, Inc.		10-Q	001-33170	3.1.2	August 15, 2017
3.2	Amended and Restated Bylaws of Netlist, Inc.		8-K	001-33170	3.1	December 20, 2012
3.2.1	Certificate of Amendment to Amended and Restated Bylaws of Netlist, Inc.		8-K	001-33170	3.1	December 29, 2017
4.1	Description of the Registrant's Securities	X				
4.2	Form of Warrant issued pursuant to the Securities Purchase Agreement, dated July 17, 2013		8-K	001-33170	4.1	July 18, 2013
4.3	Senior Secured Convertible Promissory Note, dated November 18, 2015, issued by Netlist, Inc. to SVIC No. 28 New Technology Business Investment LLP		8-K	001-33170	4.1	November 19, 2015
4.4	Stock Purchase Warrant, dated November 18, 2015, issued by Netlist, Inc. to SVIC No. 28 New Technology Business Investment LLP		8-K	001-33170	4.2	November 19, 2015
4.5	Stock Purchase Warrant, dated November 18, 2015, issued by Netlist, Inc.		10-K	001-33170	4.4	March 31, 2017

Exhibit No.	Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
4.6	Rights Agreement, dated as of April 17, 2017, by and between Netlist, Inc. and Computershare Trust Company, N.A., as rights agent		8-K	001-33170	4.1	April 17, 2017
4.7	Amendment No. 1 to Rights Agreement, dated as of April 16, 2018, by and between Netlist, Inc. and Computershare Trust Company, N.A., as rights agent.		8-K	001-33170	4.1	April 17, 2018
4.8	Amendment No. 2 to Rights Agreement, dated as of April 16, 2019, by and between the Company and Computershare Trust Company, N.A., as rights agent		8-K	001-33170	4.1	April 17, 2019
4.9	Form of Warrant Agreement to Purchase Common Stock issued pursuant to the Securities Purchase Agreement, dated September 12, 2018.		8-K	001-33170	4.1	September 14, 2018
5.1	Opinion of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.	X				
10.1#	Form of Indemnity Agreement for officers and directors		S-1	333-136735	10.12	August 18, 2006
10.2#	Employment Agreement, dated September 5, 2006, between Netlist, Inc. and Chun K. Hong		S-1	333-136735	10.13	September 27, 2006
10.3#	Amended and Restated 2006 Equity Incentive Plan of Netlist, Inc.		10-K	001-33170	10.3	March 22, 2019
10.4#	Form of Restricted Stock Award Agreement issued pursuant to the Amended and Restated 2006 Equity Incentive Plan of Netlist, Inc.		10-Q	001-33170	10.2	May 17, 2010
10.5#	Form of Stock Option Award Agreement issued pursuant to the Amended and Restated 2006 Equity Incentive Plan of Netlist, Inc.		10-K	001-33170	10.6	March 31, 2017
10.6	Loan and Security Agreement, dated October 31, 2009, between Silicon Valley Bank and Netlist, Inc.		8-K	001-33170	10.1	November 2, 2009
10.7	Intercompany Subordination Agreement, dated October 31, 2009, among Silicon Valley Bank, Netlist, Inc., and Netlist Technology Texas, L.P.		8-K	001-33170	10.2	November 2, 2009
10.8	Guarantor Security Agreement, dated October 31, 2009, between Silicon Valley Bank and Netlist Technology Texas LP		8-K	001-33170	10.3	November 2, 2009
10.9	Intellectual Property Security Agreement, dated October 31, 2009, between Silicon Valley Bank and Netlist, Inc.		8-K	001-33170	10.4	November 2, 2009
10.10	Amendment to Loan Documents, dated March 24, 2010, between Silicon Valley Bank and Netlist, Inc.		10-Q	001-33170	10.1	May 7, 2010
10.11	Amendment to Loan Documents, dated June 30, 2010, between Silicon Valley Bank and Netlist, Inc.		10-Q	001-33170	10.2	August 12, 2010

Exhibit No.	Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
10.12	Amendment to Loan Documents, dated September 30, 2010, between Silicon Valley Bank and Netlist, Inc.		10-Q	001-33170	10.1	November 16, 2010
10.13	Amendment to Loan Documents, dated May 11, 2011, between Silicon Valley Bank and Netlist, Inc.		10-Q	001-33170	10.1	May 12, 2011
10.14	Amendment to Loan Documents, dated August 10, 2011, between Silicon Valley Bank and Netlist, Inc.		10-Q	001-33170	10.1	August 15, 2011
10.15	Amendment to Loan Documents, dated May 14, 2012, between Silicon Valley Bank and Netlist, Inc.		10-Q	001-33170	10.1	May 15, 2012
10.16	Forbearance to Loan and Security Agreement, dated March 27, 2013, between Netlist, Inc. and Silicon Valley Bank		10-K	001-33170	10.32	March 29, 2013
10.17	Amendment to Loan Documents, dated July 17, 2013, between Netlist, Inc. and Silicon Valley Bank		10-Q	001-33170	10.6	November 12, 2013
10.18	Amendment to Loan Documents, dated September 30, 2014, between Netlist, Inc. and Silicon Valley Bank		10-K	001-33170	10.24	March 27, 2015
10.19	Senior Secured Convertible Promissory Note and Warrant Purchase Agreement, dated November 18, 2015, between Netlist, Inc. and SVIC No. 28 New Technology Business Investment LLP		8-K	001-33170	10.1	November 19, 2015
10.20	Registration Rights Agreement, dated November 18, 2015, between Netlist, Inc. and SVIC No. 28 New Technology Business Investment LLP		8-K	001-33170	10.2	November 19, 2015
10.21	Amendment to Loan Documents, dated January 29, 2016, between Netlist, Inc. and Silicon Valley Bank		8-K	001-33170	10.1	February 1, 2016
10.22	Amendment to Loan and Security Agreement, dated March 27, 2017, between Netlist, Inc. and Silicon Valley Bank		8-K	001-33170	10.1	March 29, 2017
10.23	Amendment to Loan and Security Agreement, dated April 12, 2017, by and between Netlist, Inc. and Silicon Valley Bank		10-Q	001-33170	10.1	August 15, 2017
10.24	Amendment to Loan and Security Agreement, dated March 20, 2018, by and between Netlist, Inc. and Silicon Valley Bank		8-K	001-33170	10.1	March 26, 2018
10.25	Amendment to Loan and Security Agreement, dated March 21, 2019, by and between Netlist, Inc. and Silicon Valley Bank		10-K	001-33170	10.25	March 22, 2019

Exhibit No.	Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
10.26	Amendment to Loan and Security Agreement, dated February 27, 2020, by and between Netlist, Inc. and Silicon Valley Bank	X				
10.27§	Investment Agreement, dated May 3, 2017, by and between Netlist, Inc. and TR Global Funding V, LLC		10-Q	001-33170	10.2	August 15, 2017
10.28	Security Agreement, dated May 3, 2017, by and between Netlist, Inc. and TR Global Funding V, LLC		10-Q	001-33170	10.3	August 15, 2017
10.29	Intercreditor Agreement, dated May 3, 2017, by and between SVIC No. 28 New Technology Business Investment L.L.P. and TR Global Funding V, LLC and consented and agreed to by Netlist, Inc.		10-Q	001-33170	10.4	August 15, 2017
10.30	Intercreditor Agreement, dated May 3, 2017, by and between Silicon Valley Bank and TR Global Funding V, LLC and consented and agreed to by Netlist, Inc.		10-Q	001-33170	10.5	August 15, 2017
10.31	Amended and Restated Intercreditor Agreement, dated April 20, 2017, by and between SVIC No. 28 New Technology Business Investment L.L.P and Silicon Valley Bank and consented and agreed to by Netlist, Inc.		10-Q	001-33170	10.6	August 15, 2017
10.32	Securities Purchase Agreement, dated as of August 27, 2018, by and between Netlist, Inc. and Iliad Research and Trading, L.P.		8-K	001-33170	10.1	August 31, 2018
10.33	Convertible Promissory Note, dated as of August 27, 2018, by and between Netlist, Inc. and Iliad Research and Trading, L.P.		8-K	001-33170	10.2	August 31, 2018
10.34	Form of Securities Purchase Agreement dated September 12, 2018, by and among Netlist, Inc. and the purchasers identified therein.		8-K	001-33170	10.1	September 14, 2018
10.35	Placement Agent Agreement dated September 12, 2018 by and between Netlist, Inc. and Roth Capital Partners, LLC.		8-K	001-33170	10.2	September 14, 2018
10.36	Purchase Agreement, dated June 24, 2019, between Netlist, Inc. and Lincoln Park Capital Fund, LLC		8-K	001-33170	1.1	June 24, 2019
10.37	Purchase Agreement, dated March 5, 2020, between Netlist, Inc. and Lincoln Park Capital Fund, LLC	X				
21.1	Subsidiaries of Netlist, Inc.	X				
23	Consent of KMJ Corbin & Company LLP	X				
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a)	X				

Exhibit No.	Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a)	X				
32+	Certification by Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350	X				
101.INS	XBRL Instance Document	X				
101.SCH	XBRL Taxonomy Extension Schema Document	X				
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	X				
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	X				
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	X				
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	X				

+ Furnished herewith.
# Management contract or compensatory plan or arrangement.
§ Confidential treatment has been granted with respect to portions of this exhibit.

Item 16. Form 10-K Summary.

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: March 10, 2020

Netlist, Inc.

By: /s/ Chun K. Hong
Chun K. Hong
President, Chief Executive Officer and Chairman of the Board

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Chun K. Hong Chun K. Hong	President, Chief Executive Officer and Chairman of the Board (Principal Executive Officer)	March 10, 2020
/s/ Gail Sasaki Gail Sasaki	Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	March 10, 2020
/s/ Jun S. Cho Jun S. Cho	Director	March 10, 2020
/s/ Kiho Choi Kiho choi	Director	March 10, 2020
/s/ Blake A. Welcher Blake A. Welcher	Director	March 10, 2020

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and Board of Directors of Netlist, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Netlist, Inc. and subsidiaries (the "Company") as of December 28, 2019 and December 29, 2018, the related consolidated statements of operations, stockholders' deficit, and cash flows for each of the years then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 28, 2019 and December 29, 2018, and the results of its operations and its cash flows for each of the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

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

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

/s/ KMJ Corbin & Company LLP

We have served as the Company's auditor since 2005.

Costa Mesa, California
March 10, 2020

NETLIST, INC. AND SUBSIDIARIES
Consolidated Balance Sheets
(in thousands, except par value amounts)

	December 28, 2019	December 29, 2018
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 8,966	$ 14,802
Restricted cash	2,750	1,850
Accounts receivable, net of allowances of $61 (2019) and $39 (2018)	3,672	2,917
Inventories	3,496	2,946
Prepaid expenses and other current assets	627	677
Total current assets	19,511	23,192
Property and equipment, net	286	279
Operating lease right-of-use assets	968	—
Other assets	1,376	1,394
Total assets	$ 22,141	$ 24,865
LIABILITIES AND STOCKHOLDERS' DEFICIT		
Current Liabilities:		
Accounts payable	$ 9,134	$ 9,497
Revolving line of credit	2,990	2,293
Accrued payroll and related liabilities	740	604
Accrued expenses and other current liabilities	793	343
Note payable	412	376
Total current liabilities	14,069	13,113
Convertible promissory notes and accrued interest, net	15,793	17,346
Operating lease liabilities	498	—
Other liabilities	144	78
Total liabilities	30,504	30,537
Commitments and contingencies		
Stockholders' deficit:		
Preferred stock, $0.001 par value—10,000 shares authorized: Series A preferred stock, $0.001 par value; 1,000 shares authorized; none issued and outstanding	—	—
Common stock, $0.001 par value—300,000 shares authorized; 169,539 (2019) and 139,283 (2018) shares issued and outstanding	169	139
Additional paid-in capital	179,086	169,355
Accumulated deficit	(187,618)	(175,166)
Total stockholders' deficit	(8,363)	(5,672)
Total liabilities and stockholders' deficit	$ 22,141	$ 24,865

See accompanying notes to consolidated financial statements.

NETLIST, INC. AND SUBSIDIARIES
Consolidated Statements of Operations
(in thousands, except per share amounts)

	Year Ended	
	December 28, 2019	**December 29, 2018**
Net sales	$ 26,103	$ 33,529
Cost of sales	23,533	31,228
Gross profit	2,570	2,301
Operating expenses:		
Research and development	2,383	2,899
Intellectual property legal fees	4,131	8,918
Selling, general and administrative	7,546	6,856
Total operating expenses	14,060	18,673
Operating loss	(11,490)	(16,372)
Other expense, net:		
Interest expense, net	(945)	(739)
Other expense, net	(4)	(11)
Total other expense, net	(949)	(750)
Loss before provision (benefit) for income taxes	(12,439)	(17,122)
Provision (benefit) for income taxes	13	(2)
Net loss	$ (12,452)	$ (17,120)
Net loss per common share:		
Basic and diluted	$ (0.08)	$ (0.16)
Weighted-average common shares outstanding:		
Basic and diluted	148,132	107,071

See accompanying notes to consolidated financial statements.

NETLIST, INC. AND SUBSIDIARIES
Consolidated Statements of Stockholders' Deficit
(in thousands)

	Series A Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balance, December 30, 2017	—	$ —	79,314	$ 80	$ 152,640	$ (158,046)	$ (5,326)
Stock-based compensation	—	—	—	—	737	—	737
Exercise of stock options	—	—	30	—	11	—	11
Issuance of restricted stock	—	—	525	—	—	—	—
Issuance of common stock, net	—	—	59,414	59	15,703	—	15,762
Warrants issued in lieu of payments	—	—	—	—	74	—	74
Estimated fair value of conversion option, in connection with convertible debt	—	—	—	—	190	—	190
Net loss	—	—	—	—	—	(17,120)	(17,120)
Balance, December 29, 2018	—	—	139,283	139	169,355	(175,166)	(5,672)
Stock-based compensation	—	—	—	—	989	—	989
Exercise of stock options	—	—	175	—	49	—	49
Restricted stock units vested and distributed	—	—	749	1	(1)	—	—
Tax withholdings related to net share settlements of equity awards	—	—	(222)	—	(77)	—	(77)
Issuance of common stock, net, and commitment shares	—	—	20,387	20	6,332	—	6,352
Common stock issued on conversion of Iliad Note	—	—	9,167	9	2,439	—	2,448
Net loss	—	—	—	—	—	(12,452)	(12,452)
Balance, December 28, 2019	—	$ —	169,539	$ 169	$ 179,086	$ (187,618)	$ (8,363)

See accompanying notes to consolidated financial statements.

NETLIST, INC. AND SUBSIDIARIES
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended	
	December 28, 2019	December 29, 2018
Cash flows from operating activities:		
Net loss	$ (12,452)	$ (17,120)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	172	254
Interest accrued on convertible promissory notes	415	361
Amortization of debt discounts	480	334
Non-cash lease expense	534	—
Stock-based compensation	989	737
Issuance of warrant in lieu of payment	—	74
Changes in operating assets and liabilities:		
Accounts receivable	(755)	80
Inventories	(550)	1,159
Prepaid expenses and other current assets	480	359
Accounts payable	(363)	3,375
Accrued payroll and related liabilities	136	(203)
Accrued expenses and other current liabilities	(571)	22
Net cash used in operating activities	(11,485)	(10,568)
Cash flows from investing activities:		
Acquisition of property and equipment	(83)	(74)
Net cash used in investing activities	(83)	(74)
Cash flows from financing activities:		
Net borrowings under line of credit	697	269
Proceeds from issuance of debt, net of $170 discount	—	2,100
Debt issuance costs	—	(23)
Principal repayments under finance lease	(13)	—
Payments on debt	(376)	(345)
Proceeds from issuance of common stock, net	6,352	15,762
Proceeds from exercise of stock options	49	11
Payments for taxes related to net share settlement of equity awards	(77)	—
Net cash provided by financing activities	6,632	17,774
Net change in cash, cash equivalents and restricted cash	(4,936)	7,132
Cash, cash equivalents and restricted cash at beginning of period	16,652	9,520
Cash, cash equivalents and restricted cash at end of period	$ 11,716	$ 16,652
Reconciliation of cash, cash equivalents and restricted cash at end of period:		
Cash and cash equivalents	$ 8,966	$ 14,802
Restricted cash	2,750	1,850
Cash, cash equivalents and restricted cash at end of period	$ 11,716	$ 16,652

See accompanying notes to consolidated financial statements.

NETLIST, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1—Description of Business

Netlist, Inc. and its wholly-owned subsidiaries (collectively the "Company" or "Netlist") provides high-performance modular memory subsystems to customers in diverse industries that require enterprise and storage class memory solutions to empower critical business decisions. The Company has a history of introducing disruptive new products, such as one of the first load-reduced dual in-line memory modules ("LRDIMM") based on its distributed buffer architecture, which has been adopted by the industry for DDR4 LRDIMM. The Company was also one of the first to bring NAND flash memory ("NAND flash") to the memory channel with its NVvault non-volatile dual in-line memory modules ("NVDIMM") using software-intensive controllers and merging dynamic random access memory integrated circuits ("DRAM ICs" or "DRAM") and NAND flash to solve data bottleneck and data retention challenges encountered in high-performance computing environments. The Company has introduced a new generation of storage class memory products called HybriDIMM to address the growing need for real-time analytics in Big Data applications, in-memory databases, high performance computing and advanced data storage solutions. The Company also resells solid state drive, NAND flash, DRAM products and other component products to end-customers that are not reached in the distribution models of the component manufacturers, including storage customers, appliance customers, system builders and cloud and datacenter customers.

Due to the ground-breaking product development of its engineering teams, Netlist has built a robust portfolio of over 130 issued and pending U.S. and foreign patents, many seminal, in the areas of hybrid memory, storage class memory, rank multiplication and load reduction. Since its inception, the Company has dedicated substantial resources to the development, protection and enforcement of technology innovations it believes are essential to its business. The Company's early pioneering work in these areas has been broadly adopted in industry-standard registered dual in-line memory module ("RDIMM") LRDIMM and NVDIMM. Netlist's objective is to continue to innovate in its field and invest further in its intellectual property portfolio, with the goal of monetizing its intellectual property through a combination of product sales and licensing, royalty or other revenue-producing arrangements, which may result from joint development or similar partnerships or defense of the Company's patents through enforcement actions against parties it believes are infringing them.

Netlist was incorporated in June 2000 and is headquartered in Irvine, California. The Company has established a manufacturing facility in the People's Republic of China ("PRC"), which became operational in July 2007. The Company operates in one reportable segment, which is the design and manufacture of high-performance memory subsystems for the server, high-performance computing and communications markets.

Liquidity

The Company incurred net loss of $12.5 million and $17.1 million for the years ended December 28, 2019 and December 29, 2018, respectively. The Company has historically financed its operations primarily with revenues generated from operations, including product sales and proceeds from issuances of equity and debt securities including convertible debt (see Note 5). The Company has also funded its operations with a revolving line of credit under a bank credit facility and a funding arrangement for costs associated with certain of its legal proceedings (see Notes 4, 5 and 8).

On November 14, 2017, the Company entered into an At Market Issuance Sales Agreement (the "Sales Agreement") with B. Riley FBR, Inc. (the "Agent") to sell shares of its common stock, with aggregate gross proceeds of up to $9.0 million, from time to time, through an "at-the-market" equity offering program under which the Agent acted as sales agent (the "ATM Program") (see Note 9). On August 29, 2018, the Company completed the offering under the ATM Program after raising net proceeds of approximately $8.6 million through the sale of 40,680,368 shares of its common stock, after deducting sales commissions and other offering expenses paid by the Company.

On May 17, 2018, the Company entered into a Board approved arm's length Share Purchase Agreement with a trust controlled by C.K. Hong, its President, Chief Executive Officer and Chairman of the Board, pursuant to which the Company sold to the trust 5,405,405 shares of its common stock at a price per share of $0.148 (the closing price of its

common stock as of the signing of the agreement) (See Note 9). The net proceeds received by the Company were $0.8 million.

On August 27, 2018, the Company entered into a Securities Purchase Agreement with Iliad Research and Trading, L.P. ("Iliad") ("Iliad Purchase Agreement"), pursuant to which the Company issued a convertible promissory note in the principal amount of $2.3 million ("Iliad Note") with an original issue discount of $0.2 million. The Iliad Note bore interest at an annual rate of 8% and would mature on August 27, 2020, unless earlier repurchased, redeemed or converted in accordance with its terms. During the year ended December 28, 2019, Iliad fully-converted the outstanding principal and accrued interest on the Iliad Note to shares of the Company's common stock, and as a result, there were no outstanding principal and accrued interest on the Iliad Note as of December 28, 2019 (See Note 5).

On September 12, 2018, the Company entered into a Securities Purchase Agreement with certain investors, pursuant to which the Company issued and sold to the investors in a registered offering an aggregate of 22,222,220 shares of its common stock and warrants to purchase up to an aggregate of 11,111,110 shares of its common stock at a per share purchase price of $0.45 per share (See Note 9). The net proceeds to the Company from this offering were approximately $9.2 million, after deducting placement agent fees and offering costs paid by the Company. The warrant has a term of five years commencing on the date when it first became exercisable on March 14, 2019 (181 days following the date of its issuance) and has an exercise price of $0.655 per share.

On June 24, 2019, the Company entered into a purchase agreement (the "2019 Purchase Agreement") with Lincoln Park Capital Fund, LLC ("Lincoln Park"), pursuant to which the Company had the right to sell to Lincoln Park up to an aggregate of $10 million in shares of its common stock over the 36-month term of the 2019 Purchase Agreement subject to the conditions and limitations set forth in the 2019 Purchase Agreement. During the year ended December 28, 2019, Lincoln Park purchased an aggregate of 19,044,762 shares of the Company's common stock for a net purchase price of $6.4 million (see Note 9).

On March 5, 2020, the Company entered into a purchase agreement (the "2020 Purchase Agreement") with Lincoln Park, pursuant to which the Company has the right to sell to Lincoln Park up to an aggregate of $20 million in shares of its common stock over the 36-month term of the 2020 Purchase Agreement subject to the conditions and limitations set forth in the 2020 Purchase Agreement (see Note 9).

Inadequate working capital would have a material adverse effect on the Company's business and operations and could cause the Company to fail to execute its business plan, fail to take advantage of future opportunities or fail to respond to competitive pressures or customer requirements. A lack of sufficient funding may also require the Company to significantly modify its business model and/or reduce or cease its operations, which could include implementing cost-cutting measures or delaying, scaling back or eliminating some or all of its ongoing and planned investments in corporate infrastructure, research and development projects, business development initiatives and sales and marketing activities, among other activities. While the Company's estimates of its operating revenues and expenses and working capital requirements could be incorrect and the Company may use its cash resources faster than it anticipates, management believes the Company's existing cash balance together with cash receipts from revenues, borrowing availability under a bank credit facility (see Note 4), funds available to be raised from the Lincoln Park arrangement (see Note 9) and funds raised through the debt and equity offerings, will be sufficient to meet the Company's anticipated cash needs for at least the next 12 months.

Note 2—Summary of Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP"). The Company has evaluated events occurring subsequent to December 28, 2019, through the filing date of this Annual Report on Form 10-K and concluded that there were no events that required recognition and disclosures, other than those discussed elsewhere in the notes hereto. Certain prior period amounts have been reclassified to conform to the current period's presentation.

Principles of Consolidation

The consolidated financial statements include the accounts of the Company. All intercompany balances and transactions have been eliminated in consolidation.

Fiscal Year

The Company's fiscal year is the 52- or 53-week period that ends on the Saturday closest to December 31. The 2019 and 2018 fiscal years ended on December 28, 2019 and December 29, 2018, respectively, and consisted of 52 weeks.

Use of Estimates

The preparation of the consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, net sales and expenses. Significant items subject to such estimates and assumptions include provisions for uncollectible receivables and sales returns, warranty liability, valuation of inventories, fair value of financial instruments, useful lives and impairment of property and equipment, inputs used to value stock-based compensation and convertible debt instruments and the realization of deferred tax assets. Actual results may differ from these estimates.

Revenue Recognition

Revenue is recognized when control is transferred to customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods and services. Revenue recognition is evaluated through the five steps outlined within the guidance. Substantially all of the Company's net sales relate to products sold at a point in time through ship-and-bill performance obligations. At contract inception, an assessment of the goods and services promised in the contracts with customers is performed and a performance obligation is identified for each distinct promise to transfer to the customer a good or service (or bundle of goods or services). To identify the performance obligations, the Company considers all of the goods or services promised in the contract regardless of whether they are explicitly stated or are implied by customary business practices. Contracts with customers are comprised of customer purchase orders, invoices (including the Company's standard terms and conditions) and written contracts.

Performance Obligations

Net sales and related cost of sales are primarily the result of promises to transfer products to customers. For performance obligations related to substantially all of the ship-and-bill products, control transfers at a point in time when title transfers upon shipment of the product to the customer, and for some sales, control transfers when title is transferred at time of receipt by the customer. Once a product has shipped or has been delivered, the customer is able to direct the use of, and obtain substantially all of the remaining benefits from, the asset. The Company considers control to have transferred upon shipment or delivery, because the Company has a present right to payment at that time, the customer has legal title to the asset, the Company has transferred physical possession of the asset, and the customer has the significant risks and rewards of ownership of the asset.

Amounts billed to its customers for shipping and handling are recorded in net sales. Shipping and handling costs incurred by the Company are included in cost of sales in the accompanying consolidated statements of operations.

Significant Payment Terms

For ship-and-bill type contracts with customers, the invoice states the final terms of the sale, including the description, quantity, and price of each product purchased. Payment terms are typically due within 30 days after delivery but, in limited instances, can range up to 60 days after delivery. Accordingly, the Company's contracts with customers do not include a significant financing component.

Variable Consideration

Customers are generally allowed limited rights of return for up to 30 days, except for sales of excess component inventories, which contain no right-of-return privileges. Product returns give rise to variable consideration that decreases the transaction price. Estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of the anticipated performance and all information (historical, current and forecasted) that is reasonably available.

Returns for products sold are estimated using the expected value method and are recorded as a reduction in reported revenues at the time of sale based upon historical product return experience and is adjusted for known trends to arrive at the amount of consideration to which the Company expects to receive. Estimated amounts are included in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved.

Warranties

The Company offers standard product warranties generally ranging from one to three years to its memory subsystem products customers, depending on the negotiated terms of any purchase agreements, and has no other post-shipment obligations or separately priced extended warranty or product maintenance contracts. These warranties require the Company to repair or replace defective product returned to the Company during the warranty period at no cost to the customer. Warranties are not offered on sales of component products. The Company records an estimate for warranty related costs at the time of sale based on its historical and estimated future product return rates and expected repair or replacement costs. Estimated future warranty costs are recorded in the period in which the sale is recorded and are included in cost of sales in the accompanying consolidated statements of operations.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash and short-term investments with original maturities of three months or less.

Restricted Cash

The Company's restricted cash consists of cash to secure standby letters of credit (see Note 4).

Fair Value of Financial Instruments

The Company accounts for certain assets and liabilities at fair value. The hierarchy below lists three levels of fair value based on the extent to which inputs used in measuring fair value are observable in the market. The Company categorizes each of its fair value measurements in one of those three levels based on the lowest level input that is significant to the fair value measurement in its entirety.

- *Level 1* – inputs are based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access. An active market is defined as a market in which transactions for the assets or liabilities occur with sufficient frequency and volume to provide pricing information on an ongoing basis.
- *Level 2* – inputs are based on quoted prices of similar instruments in active markets, quoted prices for identical or similar instruments in market that are not active, and model-based valuation techniques for which all significant assumptions are observable in the market or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- *Level 3* – inputs are generally unobservable inputs for the asset or liability, which are typically based on management's estimates of assumptions that market participants would use in pricing the assets and liabilities. The fair values are therefore determined using model-based techniques, including option pricing models and discounted cash flow models.

The Company's financial instruments consist principally of cash and cash equivalents, restricted cash, a revolving line of credit, and convertible promissory notes. The Company considers the carrying values of cash and cash equivalents and restricted cash to approximate the fair value for these financial instruments based upon an evaluation of the underlying characteristics, market data and because of the short period of time between origination of the instruments and their expected realization. The Company estimates the fair values of its revolving line of credit and convertible promissory notes by using current applicable rates for similar instruments as of the balance sheet date and an assessment of its credit rating. The carrying value of the Company's revolving line of credit at December 28, 2019 and December 29, 2018 approximates fair value because the Company's interest rate yield is near current market rates for comparable debt instruments. The Company estimates the fair value of its convertible promissory notes by using a discounted cash flow analysis using borrowing rates available to the Company for debt instruments with similar terms and maturities. The Company has determined that the valuation of its convertible promissory notes is classified in Level 2 of the fair value hierarchy. The carrying value and estimated fair value of the senior secured convertible promissory note as of December 28, 2019 were $14.6 million and $11.7 million, respectively. The carrying value and estimated fair value of the senior secured convertible promissory note as of December 29, 2018 were $14.3 million and $11.7 million, respectively. The carrying value and estimated fair value of the unsecured convertible note were $2.0 million and $1.7 million as of December 29, 2018, respectively. There were no outstanding principal and accrued interest on the unsecured convertible note as of December 28, 2019.

Accounts Receivable, net

The Company extends credit to its customers. An allowance for doubtful accounts is maintained for estimated losses resulting from the inability of the Company's customers to make required payments. The Company specifically analyzes the age of customer balances, historical bad debt experiences, customer creditworthiness and changes in customer payment terms when making estimates of the collectability of the Company's accounts receivable balances. If the Company determines that the financial condition of any of its customers has deteriorated, whether due to customer specific or general economic issues, an increase in the allowance may be made. After all attempts to collect a receivable have failed, the receivable is written off.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist principally of cash and cash equivalents, and accounts receivable. The Company invests its cash equivalents primarily in money market mutual funds. Cash equivalents are maintained with high quality institutions, the composition and maturities of which are regularly monitored by management. At times, deposits held with financial institutions may exceed the amount of insurance provided by the Federal Deposit Insurance Corporation and the Securities Investor Protection Corporation.

The Company's accounts receivable are primarily derived from sales to original equipment manufacturers in the server, high-performance computing and communications markets, as well as from sales to storage customers, appliance customers, system builders and cloud and datacenter customers. The Company performs credit evaluations of its customers' financial condition and limits the amount of credit extended when deemed necessary, but generally requires no collateral. The Company believes the concentration of credit risk in its accounts receivables is moderated by its credit evaluation process, relatively short collection terms, a high level of credit worthiness of its customers (see Note 12), foreign credit insurance, and letters of credit issued in its favor. The allowance for credit losses is maintained, and such losses historically have not been significant and have been within management's expectations.

Inventories

Inventories are valued at the lower of cost or the net realizable value. Cost is determined on an average cost basis which approximates actual cost on a first-in, first-out basis and includes raw materials, labor and manufacturing overhead. Net realizable value is the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal, and transportation. The Company evaluates inventory balances for excess quantities and obsolescence on a regular basis by analyzing estimated demand, inventory on hand, sales levels and other information and reduce inventory balances to net realizable value for excess and obsolete inventory based on this

analysis. At the point of the write-down recognition, a new, lower cost basis for that inventory is established, and subsequent changes in facts and circumstances do not result in the restoration or increase in that newly established cost basis.

Property and Equipment

Property and equipment are recorded at cost and depreciated on a straight-line basis over their estimated useful lives, which generally range from three to seven years. Leasehold improvements are recorded at cost and amortized on a straight-line basis over the shorter of their estimated useful lives or the remaining lease term. Expenditures for repairs and maintenance are expensed as incurred. Upon retirement or sale, the cost and related accumulated depreciation and amortization of disposed assets are removed from the accounts and any resulting gain or loss is included in other income, net.

Impairment of Long-Lived Assets

The Company evaluates the recoverability of the carrying value of long-lived assets held and used by the Company in its operations for impairment on at least an annual basis or whenever events or changes in circumstances indicate that their carrying value may not be recoverable. When such factors and circumstances exist, the Company compares the projected undiscounted future net cash flows associated with the related asset or group of assets over their estimated useful lives against their respective carrying amount. These projected future cash flows may vary significantly over time as a result of increased competition, changes in technology, fluctuations in demand, consolidation of the Company's customers and reductions in average sales prices. If the carrying value is determined not to be recoverable from future operating cash flows, the asset is deemed impaired and an impairment loss is recognized to the extent the carrying value exceeds the estimated fair value of the asset. The fair value of the asset or asset group is based on market value when available, or when unavailable, on discounted expected cash flows. The management believes there is no impairment of long-lived assets as of December 28, 2019 and December 29, 2018.

Leases

The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, accrued expenses and other current liabilities, and operating lease liabilities on its consolidated balance sheets. Finance leases are included in property and equipment, accrued expenses and other current liabilities, and other liabilities in its consolidated balance sheets.

ROU assets represent the right of the Company to use an underlying asset for the lease term and lease liabilities represent the obligation of the Company to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As most of the Company's leases do not provide an implicit rate, the Company uses its incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments. The Company uses the implicit rate when readily determinable. The operating lease ROU asset also includes any lease payments made and excludes lease incentives. The lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Lease expense for lease payments is recognized on a straight-line basis over the lease term.

The Company has lease agreements with lease and non-lease components, which are accounted for as a single lease component. The Company does not present short-term leases on the balance sheet, as those leases have a lease term of twelve months or less at inception and do not contain purchase options or renewal terms that the Company is reasonably certain to exercise.

Stock-Based Compensation

Stock-based awards are comprised principally of stock options, restricted stock awards ("RSAs") and restricted stock units ("RSUs"). Stock-based compensation cost is measured at the grant date based on the fair value of the award and is recognized as an expense over the requisite service period, which is the vesting period, on a straight-line basis, net

of estimated forfeitures. The Company uses the Black-Scholes option pricing model to determine the grant date fair value of stock options. The model requires the Company to estimate the expected volatility and expected term of the stock options, which are highly complex and subjective variables. The expected volatility is based on the historical volatility of the Company's common stock. The expected term is computed using the simplified method as the Company's best estimate given its lack of actual exercise history. The risk-free rate selected to value any particular grant is based on the U.S. Treasury rate that corresponds to the expected term of the grant effective as of the date of the grant. The expected dividend assumption is based on the Company's history and management's expectation regarding dividend payouts. The grant-date fair value of restricted stock and RSUs equals the closing price of the Company's common stock on the grant date.

Prior to the adoption of FASB ASU No. 2018-07, *Compensation – Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting* ("ASU 2018-07" or "Topic 718") in the second quarter of 2018, the Company accounted for equity-based awards to non-employees in accordance with ASC Topic 505, *Equity*. All transactions in which goods or services were the consideration received for the issuance of equity instruments were accounted for based on the fair value of the consideration received or the fair value of the equity instrument issued, whichever was more reliably measurable. The measurement date used to determine the estimated fair value of the equity instrument issued was the earlier of the date on which the third-party performance was complete or the date on which it was probable that performance would occur. Upon the adoption of ASU No. 2018-07, the Company accounts for all stock-based awards in accordance with Topic 718.

Income Taxes

Deferred income tax assets and liabilities are recognized for temporary differences between the financial statement carrying amounts of assets and liabilities and the amounts that are reported in the income tax returns. Deferred taxes are evaluated for realization on a jurisdictional basis. The Company records valuation allowances to reduce deferred tax assets to the amount that is more likely than not to be realized. In making this assessment, management analyzes future taxable income, reversing temporary differences and ongoing tax planning strategies. Should a change in circumstances lead to a change in judgment about the realizability of deferred tax assets in future years, the Company will adjust related valuation allowances in the period that the change in circumstances occurs, along with a corresponding increase or charge to income.

The Company recognizes the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained upon examination by the taxing authorities based on the technical merits of the Company's position. The tax benefit recognized in the financial statements for a particular tax position is based on the largest benefit that is more likely than not to be realized. The amount of unrecognized tax benefits is adjusted as appropriate for changes in facts and circumstances, such as significant amendments to existing tax laws, new regulations or interpretations by the taxing authorities, new information obtained during a tax examination, or resolution of an examination. The Company recognizes both accrued interest and penalties associated with uncertain tax positions as a component of provision for income taxes in the consolidated statements of operations.

The application of tax laws and regulations is subject to legal and factual interpretation, judgment and uncertainty. Tax laws and regulations may change as a result of changes in fiscal policy, changes in legislation, the evolution of regulations and court rulings. Therefore, the actual liability for U.S. or foreign taxes may be materially different from the Company's estimates, which could require the Company to record additional tax liabilities or to reduce previously recorded tax liabilities, as applicable.

Contingent Legal Expenses

Contingent legal fees are expensed in the consolidated statements of operations in the period that the related revenues are recognized. In instances where there are no recoveries from potential infringers, no contingent legal fees are paid; however, the Company may be liable for certain out of pocket legal costs incurred pursuant to the underlying legal services agreement.

Research and Development Expenses

Research and development expenditures are expensed in the period incurred.

Foreign Currency Remeasurement

The functional currency of the Company's foreign subsidiaries is the U.S. dollar. Local currency financial statements are remeasured into U.S. dollars at the exchange rate in effect as of the balance sheet date for monetary assets and liabilities and the historical exchange rate for nonmonetary assets and liabilities. Expenses are remeasured using the average exchange rate for the period, except items related to nonmonetary assets and liabilities, which are remeasured using historical exchange rates. All remeasurement gains and losses are included in determining net loss. Transaction gains and losses were not significant during the years ended December 28, 2019 or December 29, 2018.

Net Loss Per Share

The Company computes net loss per share using the two-class method required for participating securities. The Company considers restricted stock to be participating securities because holders of such shares have nonforfeitable dividend rights in the event of the Company's declaration of a dividend for common shares. Under the two-class method, undistributed earnings are allocated to common stock and the participating securities according to their respective participating rights in undistributed earnings, as if all the earnings for the period had been distributed. No allocation of undistributed earnings to participating securities was performed for periods with net losses as such securities do not have a contractual obligation to share in the losses of the Company.

Basic net loss per share is calculated by dividing net loss by the weighted-average common shares outstanding during the period following the two-class method. Diluted net loss per share is calculated by dividing the net loss by the weighted-average shares and dilutive potential common shares outstanding during the period. Dilutive potential shares consist of dilutive shares issuable upon the exercise of outstanding stock options and warrants computed using the treasury stock method, shares issuable under the conversion feature of convertible notes using the "if-converted" method, and shares issuable upon the vesting of restricted stock. In periods of losses, basic and diluted loss per share are the same, as the effect of stock options, warrants, convertible notes and unvested restricted stock awards on loss per share is anti-dilutive.

Adoption of New Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-02, *Leases* (Topic 842), as amended ("ASC 842"), which modifies lease accounting for lessees to increase transparency and comparability by recording lease assets and liabilities for operating leases and disclosing key information about leasing arrangements. The Company adopted ASC 842 effective December 30, 2018 using a modified retrospective method and did not restate comparative periods. As permitted under the transition guidance, the Company carried forward the assessment of whether its contracts contain or are leases, classification of its leases and remaining lease terms. The Company also used hindsight in determining lease terms. Based on the lease portfolio as of December 30, 2018, the Company recognized approximately $1.5 million of operating lease right-of-use assets and operating lease liabilities on its consolidated balance sheet upon adoption, primarily relating to real estate. No adjustments were required to be made to accumulated deficit upon adoption.

Recent Accounting Pronouncements

In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740) Simplifying the Accounting for Income Taxes* ("ASU 2019-12"), which eliminates certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. ASU 2019-12 also clarifies and simplifies other aspects of the accounting for income taxes. ASU 2019-12 is effective for the Company beginning January 3, 2021 with early adoption permitted for any interim period before the effective date. Certain amendments of ASU 2019-12 may be adopted on a retrospective

basis, modified retrospective basis or prospective basis. The Company is currently evaluating the impact ASU 2019-12 will have on its consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract (a consensus of the FASB Emerging Issues Task Force)*("ASU 2018-15"), which amends the accounting for implementation, setup, and other upfront costs in a hosting arrangement that is a service contract. ASU 2018-15 is effective for the Company beginning December 29, 2019 with early adoption permitted for any interim period before the effective date. The Company does not expect the adoption of ASU 2018-15 will have a material impact on its consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement* ("ASU 2018-13"), which removes, modifies, and adds various disclosure requirements on fair value measurements in Topic 820. ASU 2018-13 is effective for the Company beginning December 29, 2019 with early adoption permitted upon the issuance of this ASU. The amendments of ASU 2018-13 on changes in unrealized gains and losses, the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and the narrative description of measurement uncertainty should be applied prospectively for only the most recent interim or annual period presented in the initial fiscal year of adoption. All other amendments should be applied retrospectively to all periods presented upon their effective date. An entity is permitted to early adopt any removed or modified disclosures upon issuance of this ASU and delay adoption of the additional disclosures until their effective date. The Company does not expect the adoption of ASU 2018-13 will have a material impact on its consolidated financial statements.

Note 3—Supplemental Financial Information

Inventories

Inventories consisted of the following (in thousands):

	December 28, 2019	December 29, 2018
Raw materials	$ 1,052	$ 1,072
Work in process	25	25
Finished goods	2,419	1,849
	$ 3,496	$ 2,946

Property and Equipment, net

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

	December 28, 2019	December 29, 2018
Machinery and equipment	$ 7,867	$ 8,850
Computer equipment and software	2,447	3,878
Leasehold improvements	737	833
Furniture and fixtures	55	420
	11,106	13,981
Less: accumulated depreciation and amortization	(10,820)	(13,702)
	$ 286	$ 279

Substantially all the Company's property and equipment, net, are located within the United States as of December 28, 2019 and December 29, 2018.

Other Assets

Other assets consisted of the following (in thousands):

	December 28, 2019	December 29, 2018
Refundable withholding tax	$ 1,320	$ 1,320
Other assets	56	74
	$ 1,376	$ 1,394

Refundable withholding tax represents the amount of tax withheld by the Company's customer in the Republic of Korea in November 2015 and is determined to be refundable from the Korean tax authority.

Disaggregation of Net Sales

The following table shows disaggregated net sales by major source (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
Resales of third-party products	$ 19,982	$ 25,148
Sale of the Company's modular memory subsystems	6,121	8,381
Total net sales	$ 26,103	$ 33,529

Net sales by country presented below are based on the billing location of the customer (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
United States	$ 19,919	$ 23,533
China(1)	2,167	4,151
Other countries	4,017	5,845
Total net sales	$ 26,103	$ 33,529

(1) China includes Hong Kong and Taiwan.

The United States was the only country that accounted for more than 10% of the Company's net sales for the year ended December 28, 2019. For the year ended December 29, 2018, the United States and China were the only countries that accounted for more than 10% of the Company's net sales.

Computation of Net Loss Per Share

The following table shows the computation of basic and diluted net loss per share of common stock (in thousands, except per share data):

	Year Ended	
	December 28, 2019	December 29, 2018
Numerator: Net loss	$ (12,452)	$ (17,120)
Denominator: Weighted-average common shares outstanding—basic and diluted	148,132	107,071
Net loss per share—basic and diluted	$ (0.08)	$ (0.16)

No allocation of undistributed earnings to participating securities was performed for periods with net losses as such securities do not have a contractual obligation to share in the losses of the Company.

The table below sets forth potentially dilutive weighted average common share equivalents, consisting of shares issuable upon the exercise of outstanding stock options and warrants using the treasury stock method, shares issuable upon conversion of the SVIC Note and the Iliad Note (see Note 5) using the "if-converted" method, and the vesting of restricted stock awards. These potential weighted average common share equivalents have been excluded from the diluted net loss per share calculations above as their effect would be anti-dilutive (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
Weighted average common share equivalents	13,357	15,125

Cash Flow Information

The following table shows supplemental disclosures of cash flow information and non-cash financing activities (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
Supplemental disclosure of cash flow information:		
Cash paid for Interest	$ 62	$ 55
Supplemental disclosure of non-cash financing activities:		
Common stock issued on conversion of convertible note payable and accrued interest	$ 2,448	$ —
Debt financing of insurance	$ 412	$ 721
Iliad debt discount	$ —	$ 190

Note 4—Credit Agreements

SVB Credit Agreement

On October 31, 2009 ("Effective Date"), the Company and Silicon Valley Bank ("SVB") entered into a credit agreement (as amended, the "SVB Credit Agreement"), which provides for a revolving line of credit up to $5.0 million. The borrowing base is limited to 85% of the eligible accounts receivable (increased from 80% as of August 29, 2018), subject to certain adjustments. As of December 28, 2019, the borrowings under the SVB Credit Agreement bear interest based on the Wall Street Journal "prime rate" plus 2.75% and mature on March 30, 2020. On February 27, 2020, the SVB Credit Agreement was amended to extend the maturity date to April 30, 2021. The SVB Credit Agreement requires letters of credit to be secured by cash, which is classified as restricted cash in the accompanying consolidated balance sheets. As of December 28, 2019 and December 29, 2018, (i) outstanding letters of credit were $2.8 million and $1.9 million, respectively, (ii) outstanding borrowings were of $3.0 million and $2.3 million, respectively, and (iii) availability under the revolving line of credit was $0.2 million and $0.2 million, respectively.

On April 12, 2017, the Company and SVB entered into an amendment to the SVB Credit Agreement to, among other things, obtain SVB's consent in connection with the Company's rights agreement with Computershare Trust Company, N.A., as rights agent (see Note 9), and make certain administrative changes in connection with the Company's funding arrangement with TR Global Funding V, LLC, an affiliate of TRGP Capital Management, LLC ("TRGP") (see Note 8).

For all periods before April 20, 2017, all obligations under the SVB Credit Agreement were secured by a first priority security interest in the Company's tangible and intangible assets, other than its patent portfolio, which was subject to a first priority security interest held by Samsung Venture Investment Co., ("SVIC") (see Note 5). Certain of these lien priorities were modified in April and May 2017 in connection with the Company's establishment of a funding arrangement with TRGP for certain of the Company's litigation expenses in connection with certain of its legal proceedings against SK hynix Inc., a South Korean memory semiconductor supplier ("SK hynix"). On May 3, 2017, TRGP entered into an intercreditor agreement with each of SVIC and SVB, and on April 20, 2017, SVIC and SVB entered into an intercreditor agreement with each other (such intercreditor agreements, collectively, the "Intercreditor Agreements"). Pursuant to the terms of the Intercreditor Agreements, SVB's security interests in the Company's assets have been modified as follows: SVB has a first priority security interest in all of the Company's tangible and intangible assets other than its patent portfolio and its claims underlying and any proceeds it may receive from the SK hynix proceedings; a second priority security interest in the Company's patent portfolio other than the patents that are the subject of the SK hynix proceedings; and a third priority security interest in the Company's patents that are the subject of the SK hynix proceedings (see Note 8).

The SVB Credit Agreement subjects the Company to certain affirmative and negative covenants, including financial covenants with respect to the Company's liquidity and restrictions on the payment of dividends. As of December 28, 2019, the Company was in compliance with its covenants under the SVB Credit Agreement.

Note 5—Debt

The following table shows the summary of the Company's outstanding indebtedness (in thousands):

	December 28, 2019	December 29, 2018
Senior secured convertible note, due December 2021, including accrued interest of $1,233 (2019) and $934 (2018), respectively	$ 16,233	$ 15,934
Unsecured convertible note, due August 2020, including accrued interest of $62 (2018)	—	2,332
Note payable	412	376
Unamortized debt discounts and issuance costs	(440)	(920)
	16,205	17,722
Less: current portion	(412)	(376)
	$ 15,793	$ 17,346

Senior Secured Convertible Note

On November 18, 2015, in connection with entering into the JDLA with Samsung, the Company issued to SVIC a senior secured convertible note ("SVIC Note") and stock purchase warrant ("SVIC Warrant"). The SVIC Note has an original principal amount of $15.0 million, accrues interest at a rate of 2.0% per year, is due and payable in full on December 31, 2021, and is convertible into shares of the Company's common stock at a conversion price of $1.25 per share, subject to certain adjustments, on the maturity date of the SVIC Note. Upon a change of control of the Company prior to the maturity date of the SVIC Note, the SVIC Note may, at the Company's option, be assumed by the surviving entity or be redeemed upon the consummation of such change of control for the principal and accrued but unpaid interest as of the redemption date. The SVIC Warrant grants SVIC a right to purchase 2,000,000 shares of the Company's common stock at an exercise price of $0.30 per share, subject to certain adjustments, is only exercisable in the event the Company exercises its right to redeem the SVIC Note prior to its maturity date, and expires on December 31, 2025.

The SVIC Warrant was valued at $1.2 million, based on its relative fair value, and was recorded as a debt discount. The Company also recorded $0.2 million of debt issuance costs as a debt discount for professional services fees rendered in connection with the transaction. These amounts are amortized to interest expense over the term of the SVIC Note using the interest method. For the years ended December 28, 2019 and December 29, 2018, the Company amortized $0.2 million and $0.2 million, respectively, to interest expense in the accompanying consolidated statements of operations. The effective interest rate, including accretion of the SVIC Note to par and amortization of debt issuance costs, was approximately 3.4%. As of December 28, 2019 and December 29, 2018, the outstanding principal and accrued

interest on the SVIC Note was $16.2 million and $15.9 million, respectively, and the outstanding SVIC Note balance, net of unamortized debt discounts and issuance costs, was $15.8 million and $15.2 million, respectively.

In connection with the SVIC Note, SVIC was granted a first priority security interest in the Company's patent portfolio and a second priority security interest in all of the Company's other tangible and intangible assets. Upon issuance of the SVIC Note, the Company, SVB and SVIC entered into an Intercreditor Agreement pursuant to which SVB and SVIC agreed to their relative security interests in the Company's assets. In May 2017, SVIC, SVB and TRGP entered into additional Intercreditor Agreements to modify certain of these lien priorities (see Note 8). Additionally, upon issuance of the SVIC Note and the SVIC Warrant, the Company and SVIC entered into a Registration Rights Agreement pursuant to which the Company is obligated to register with the Securities and Exchange Commission, upon demand by SVIC, the shares of the Company's common stock issuable upon conversion of the SVIC Note or upon exercise of the SVIC Warrant.

The SVIC Note subjects the Company to certain affirmative and negative operating covenants. As of December 28, 2019, the Company was in compliance with its covenants under the SVIC Note.

Unsecured Convertible Note

On August 27, 2018, the Company entered into the Iliad Purchase Agreement, pursuant to which the Company issued the $2.3 million Iliad Note with an original issue discount of $0.2 million. The Iliad Note bore interest at an annual rate of 8% and would mature on August 27, 2020, unless earlier repurchased, redeemed or converted in accordance with its terms.

The Iliad Note provided Iliad with the right to convert, at any time, all or any part of the outstanding principal and accrued but unpaid interest into shares of the Company's common stock at a conversion price of $0.36 per share ("Lender Conversion Price"). Further, beginning on April 1, 2019, the Iliad Note also provided Iliad with the right to redeem all or any portion of the Iliad Note ("Redemption Amount") up to a maximum monthly amount of $0.35 million. The payments of each Redemption Amount might either be made in cash, by converting such Redemption Amount into shares of the Company's common stock ("Redemption Conversion Shares"), or a combination thereof, at the Company's election.

The number of Redemption Conversion Shares equaled the portion of the applicable Redemption Amount being converted divided by the lesser of the Lender Conversion Price or the Market Price, that was 85% of the Company's lowest closing bid price during the 20 trading days immediately preceding the applicable redemption date ("Redemption Conversion Price"), provided that the Market Price should not be less than $0.11 per share (the "Redemption Price Floor"). In the event any applicable redemption conversion price was below the Redemption Price Floor, then either: (i) the Company would honor the redemption conversion at the then effective redemption conversion price for a Redemption Amount not to exceed $0.15 million if the redemption conversion price was equal to or greater than $0.06 per share or (ii) the Company would pay the applicable Redemption Amount up to $0.15 million in cash and not in Redemption Conversion Shares.

The $2.1 million of proceeds received from the issuance of the Iliad Note was initially allocated between long-term debt (the liability component) at $1.9 million and additional paid-in capital (the equity component) at $0.2 million, in the consolidated balance sheet. The carrying amount of the liability component was calculated using the fair value of a similar liability without a conversion feature. The carrying amount of the equity component, representing the conversion option, was determined by deducting the fair value of the liability component from the proceeds received. The amount allocated to the equity component along with the original issue discount and fees paid to Iliad was amortized to interest expense over the expected life of 14 months using the interest method. For the years ended December 28, 2019 and December 29, 2018, the Company amortized $0.3 million and $0.1 million, respectively, to interest expense in the accompanying consolidated statements of operations. The effective interest rate, including accretion of the Iliad Note to par and amortization of debt issuance costs, was approximately 22.5%. The equity component was not remeasured as long as it continued to meet the conditions for equity classification. The issuance costs incurred related to the issuance of the Iliad Note were not material.

The Iliad Note was not secured and did not have any financial covenants requirements the Company needed to comply. The Company made certain customary representations and warranties and had agreed to customary covenants and obligations. The Iliad Purchase Agreement and Iliad Note contained customary events of default upon the occurrence and during the continuance of which all obligations under the Iliad Purchase Agreement and Iliad Note might be declared immediately due and payable.

During the year ended December 28, 2019, Iliad fully-converted the outstanding principal and accrued interest on the Iliad Note to shares of the Company's common stock as follows: (1) $1.9 million of the outstanding principal and accrued interest on the Iliad Note to 7,778,270 shares of the Company's common stock at the Redemption Conversion Price and (2) $0.5 million of the outstanding principal and accrued interest on the Iliad Note to 1,388,890 shares of the Company's common stock at the Lender Conversion Price. As a result of these conversions, as of December 28, 2019, there were no outstanding principal and accrued interest on the Iliad Note. As of December 29, 2018, the outstanding principal and accrued interest on the Iliad Note was $2.3 million and the outstanding Iliad Note balance, net of unamortized debt discounts and issuance costs, was $2.0 million.

Contractual Maturities of Debt Obligations

The aggregate contractual maturities of all borrowings due subsequent to December 28, 2019, including accrued interest, are as follows (in thousands):

Fiscal Year	**Amount**
2020	$ 412
2021	16,233
Total	$ 16,645

Note 6—Leases

The Company has operating and finance leases primarily associated with office and manufacturing facilities and certain equipment. The determination of which discount rate to use when measuring the lease obligation was deemed a significant judgment.

Lease cost and supplemental cash flow information related to operating and finance leases were as follows (in thousands):

	Year Ended December 28, 2019
Lease cost	
Operating lease cost	$ 623
Finance lease cost	
Amortization of right-of-use assets	$ 14
Interest on lease liabilities	3
Total finance lease cost	$ 17
Cash paid for amounts included in the measurement of lease liabilities	
Operating cash flows from operating leases	$ 592
Operating cash flows from finance leases	3
Financing cash flows from finance leases	13
Right-of-use assets obtained in exchange for lease obligations	
Finance leases	$ 96

Supplemental balance sheet information related to leases was as follows:

(in thousands)	December 28, 2019
Operating Leases	
Operating lease right-of-use assets	$ 968
Accrued expenses and other current liabilities	$ 511
Operating lease liabilities	498
Total operating lease liabilities	$ 1,009
Finance Leases	
Property and equipment, at cost	$ 96
Accumulated depreciation	(14)
Property and equipment, net	$ 82
Accrued expenses and other current liabilities	$ 18
Other long-term liabilities	65
Total finance lease liabilities	$ 83
Weighted Average Remaining Lease Term (in years)	
Operating lease	2.1
Finance lease	4.3
Weighted Average Discount Rate	
Operating lease	7.9 %
Finance lease	5.1 %

Maturities of lease liabilities as of December 28, 2019 were as follows (in thousands):

Fiscal Year	Operating Leases	Finance Leases
2020	$ 570	$ 22
2021	364	22
2022	163	22
2023	—	22
2024	—	5
Total lease payments	1,097	93
Less: imputed interest	(88)	(10)
Total	$ 1,009	$ 83

A summary of future minimum lease payments under operating leases as of December 29, 2018 was as follows (in thousands):

Fiscal Year	Amount
2019	$ 399
2020	208
Total minimum lease payments	$ 607

Note 7—Income Taxes

United States and foreign loss before provision (benefit) for income taxes was as follows (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
United States	$ (11,916)	$ (16,568)
Foreign	(523)	(554)
	$ (12,439)	$ (17,122)

The provision (benefit) for income taxes consisted of the following (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
Current:		
Federal	$ —	$ —
State	13	(2)
Total current	13	(2)
Deferred:		
Federal	(2,256)	(2,133)
State	(769)	(1,760)
Foreign	166	(74)
Change in valuation allowance	2,859	3,967
Total deferred	—	—
Provision (benefit) for income taxes	$ 13	$ (2)

Income taxes differ from the amounts computed by applying the statutory federal income tax rate of 21% for 2019 and 2018. The reconciliation of this difference is as follows (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
Statutory federal income tax rate	21%	21%
Change in valuation allowance	(18%)	(19%)
Other	(3%)	(2%)
Effective tax rate	—%	—%

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The significant components of the deferred tax assets and liabilities are as follows (in thousands):

	December 28, 2019	December 29, 2018
Deferred tax assets:		
Operating loss carryforward	$ 32,014	$ 29,365
Tax credit carryforwards	3,664	3,578
Foreign operating loss carryforward	759	925
Reserves and allowances	643	505
Stock-based compensation	368	458
Other	672	264
Total deferred tax assets	38,120	35,095
Deferred tax liabilities:		
Operating lease right-of-use assets	(261)	—
Prepaid expenses	(161)	(171)
Basis difference in warrant and note	(106)	(191)
Total deferred tax liabilities	(528)	(362)
Net deferred tax assets	37,592	34,733
Valuation allowance	(37,592)	(34,733)
	$ —	$ —

The Company evaluates whether a valuation allowance should be established against its deferred tax assets based on the consideration of all available evidence using a “more likely than not” standard. In making such judgments, significant weight is given to evidence that can be objectively verified. As of December 28, 2019 and December 29, 2018, a valuation allowance of $37.6 million and $34.7 million, respectively, has been provided based on the Company’s assessment that it is more likely than not that sufficient taxable income will not be generated to realize the tax benefits of the temporary differences. The valuation allowance increased by $2.9 million and $3.9 million during the years ended December 28, 2019 and December 29, 2018, respectively. These increases in the years ended December 28, 2019 and December 29, 2018 primarily relate to the increases in the net operating loss (“NOL”) carryforward.

As of December 28, 2019, the Company had (i) $131.8 million of federal NOL carryforwards, of which $104.2 million will expire from 2029 through 2037, and $27.6 million of which will be carried forward indefinitely, (ii) $71.9 million of state NOL carryforwards, which begin to expire in 2029, (iii) federal tax credit carryforwards of $1.8 million, which begin to expire in 2026, and (iv) state tax credit carryforwards of $1.9 million, which will be carried forward indefinitely. In addition, as of December 28, 2019, the Company had $2.5 million of foreign NOL carryforwards from various jurisdictions, which begin to expire in 2020. Utilization of the NOL and tax credit carryforwards is subject to an annual limitation due to the ownership percentage change limitations provided by Section 382 of the Internal Revenue Code (the “Code”) and similar state and foreign law provisions. Under Section 382 of the Code, substantial changes in our ownership may limit the amount of NOL and tax credit carryforwards that are available to offset taxable income. The annual limitation would not automatically result in the loss of NOL and tax credit carryforwards but may limit the amount available in any given future period. Additional limitations on the use of these tax attributes could occur in the event of possible disputes arising in examination from various taxing authorities.

The Company files income tax returns with federal, state and foreign jurisdictions. The Company is no longer subject to Internal Revenue Service (“IRS”) or state examinations for periods prior to 2015, although certain carryforward attributes that were generated prior to 2015 may still be adjusted by the IRS.

The Company includes interest and penalties related to uncertain tax positions within the provision for income taxes. As of December 28, 2019 and December 29, 2018, the interest or penalties accrued related to unrecognized tax benefits were insignificant, and during the years ended December 28, 2019 and December 29, 2018, the interest and penalties related to uncertain tax position recorded were insignificant. As of December 28, 2019, the Company had no unrecognized tax benefits that would significantly change in the next 12 months.

Note 8—Commitments and Contingencies

Contingent Legal Expenses

The Company may retain the services of law firms that specialize in patent licensing and enforcement and patent law in connection with its licensing and enforcement activities. These law firms may be retained on a contingent fee basis whereby such law firms are paid on a scaled percentage of any negotiated fee, settlements or judgments awarded based on how and when the fees, settlements or judgments are obtained.

TRGP Agreement and Related Intercreditor Agreements

On May 3, 2017, the Company and TRGP entered into an investment agreement (the "TRGP Agreement"), which generally provides that TRGP will directly fund the costs incurred by or on behalf of the Company in connection with certain legal proceedings against SK hynix (see "Litigation and Patent Reexaminations" in this Note 8 below), including costs incurred since January 1, 2017 and costs to be incurred in the future in the Company's first action in the U.S. International Trade Commission ("ITC") and its U.S. district court proceedings, but excluding the Company's second ITC action and its proceedings in international courts (all such funded costs, collectively, the "Funded Costs"). In exchange for such funding, the Company has agreed that, if the Company recovers any proceeds in connection with the funded SK hynix proceedings, it will pay to TRGP the amount of the Funded Costs paid by TRGP plus an escalating premium based on when any such proceeds are recovered, such that the premium will equal a specified low-to-mid double-digit percentage of the amount of the Funded Costs and such percentage will increase by a specified low double-digit amount each quarter after a specified date until any such proceeds are recovered. In addition, pursuant to the terms of a separate security agreement between the Company and TRGP dated May 3, 2017 (the "Security Agreement"), the Company has granted to TRGP (i) a first priority lien on, and security in, the claims underlying the funded SK hynix proceedings and any proceeds that may be received by the Company in connection with these proceedings, and (ii) a second priority lien on, and security in, the Company's patents that are the subject of the funded SK hynix proceedings.

The TRGP Agreement does not impose financial covenants on the Company. Termination events under the TRGP Agreement include, among others, any failure by the Company to make payments to TRGP thereunder upon receipt of recoveries in the SK hynix proceedings; the occurrence of certain bankruptcy events; certain breaches by the Company of its covenants under the TRGP Agreement or the related Security Agreement; and the occurrence of a change of control of the Company. If any such termination event occurs, subject to certain cure periods for certain termination events, TRGP would have the right to terminate its obligations under the TRGP Agreement, including its obligation to make any further payments of Funded Costs after the termination date. In the event of any such termination by TRGP, the Company would continue to be obligated to pay TRGP the portion of any proceeds the Company may recover in connection with the SK hynix proceedings that TRGP would have been entitled to receive absent such termination, as described above, and TRGP may also be entitled to seek additional remedies pursuant to the dispute resolution provisions of the TRGP Agreement.

In connection with the TRGP Agreement, in May 2017, TRGP, SVIC and SVB entered into the Intercreditor Agreements. Pursuant to the terms of the Intercreditor Agreements, TRGP, SVB and SVIC have agreed to their relative security interest priorities in the Company's assets, such that: (i) TRGP has a first priority security interest in the Company's claims underlying the funded SK hynix proceedings and any proceeds that may be received by the Company in connection with these proceedings, and a second priority security interest in the Company's patents that are the subject of the funded SK hynix proceedings, (ii) SVIC has a first priority security interest in the Company's complete patent portfolio and a second priority security interest in all of the Company's other tangible and intangible assets (other than the Company's claims underlying and any proceeds it may receive from the SK hynix proceedings funded under the TRGP Agreement), and (iii) SVB has a first priority security interest in all of the Company's tangible and intangible assets other than its patent portfolio and its claims underlying and any proceeds it may receive from the SK hynix proceedings funded under the TRGP Agreement, a second priority security interest in the Company's patent portfolio other than the patents that are the subject of the SK hynix proceedings funded under the TRGP Agreement, and a third priority security interest in the Company's patents that are the subject of the SK hynix proceedings funded under the TRGP Agreement. The Company consented and agreed to the terms of each of the Intercreditor Agreements.

Legal expenses incurred by the Company but paid by TRGP pursuant to the terms of the TRGP Agreement are excluded from the consolidated financial statements. During the years ended December 29, 2018 and December 30, 2017, the Company excluded legal expenses of $1.8 million and $10.2 million, respectively, as a result of TRGP's payment of these expenses under the TRGP Agreement. The Company does not anticipate any further legal expenses will be paid by TRGP under this agreement. During the year ended December 28, 2019, there were no legal expenses excluded as a result of TRGP's payment of these expenses under the TRGP Agreement. Any settlement or other cash proceeds the Company may recover in the future in connection with the funded SK hynix proceedings would be reduced by the aggregate amount of legal expenses excluded by the Company as a result of TRGP's payment of these expenses under the TRGP Agreement, plus the premium amount due to TRGP under the terms of the TRGP Agreement at the time of any such recovery. On January 23, 2020, the Company and TRGP entered into an amendment to the TRGP Agreement to alter the recovery sharing formula related to claims against SK hynix for alleged infringement of the Company's patents.

Litigation and Patent Reexaminations

The Company owns numerous patents and continues to seek to grow and strengthen its patent portfolio, which covers various aspects of the Company's innovations and includes various claim scopes. The Company plans to pursue avenues to monetize its intellectual property portfolio, in which it would generate revenue by selling or licensing its technology, and it intends to vigorously enforce its patent rights against alleged infringers of such rights. The Company dedicates substantial resources to protecting and enforcing its intellectual property rights, including with patent infringement proceedings it files against third parties and defense of its patents against challenges made by way of reexamination and review proceedings at the U.S. Patent and Trademark Office ("USPTO") and Patent Trial and Appeal Board ("PTAB"). The Company expects these activities to continue for the foreseeable future, with no guarantee that any ongoing or future patent protection or litigation activities will be successful, or that the Company will be able to monetize its intellectual property portfolio. The Company is also subject to litigation based on claims that it has infringed on the intellectual property rights of others.

Any litigation, regardless of its outcome, is inherently uncertain, involves a significant dedication of resources, including time and capital, and diverts management's attention from other activities of the Company. As a result, any current or future infringement claims or patent challenges by or against third parties, whether or not eventually decided in the Company's favor or settled, could materially adversely affect the Company's business, financial condition and results of operations. Additionally, the outcome of pending or future litigation and related patent reviews and reexaminations, as well as any delay in their resolution, could affect the Company's ability to continue to sell its products, protect against competition in the current and expected markets for its products or license or otherwise monetize its intellectual property rights in the future.

Google Litigation

On December 4, 2009, the Company filed a patent infringement lawsuit against Google, Inc. ("Google") in the U.S. District Court for the Northern District of California (the "Northern District Court"), seeking damages and injunctive relief based on Google's alleged infringement of the Company's U.S. Patent No. 7,619,912 (the "'912 patent"), which relates generally to technologies to implement rank multiplication. In February 2010, Google answered the Company's complaint and asserted counterclaims against the Company seeking a declaration that the patent is invalid and not infringed, and claiming that the Company committed fraud, negligent misrepresentation and breach of contract based on the Company's activities in the Joint Electron Device Engineering Council ("JEDEC") standard-setting organization. The counterclaim seeks unspecified compensatory damages. Accruals have not been recorded for loss contingencies related to Google's counterclaim because it is not probable that a loss has been incurred and the amount of any such loss cannot be reasonably estimated. In October 2010, Google requested and was later granted an *Inter Partes* Reexamination of the '912 patent by the USPTO. The reexamination proceedings are described below. In connection with the reexamination request, the Northern District Court granted the Company's and Google's joint request to stay the '912 patent infringement lawsuit against Google until the completion of the reexamination proceedings. On January 31, 2019, the PTAB, in response to Google's rehearing request, denied rehearing of the PTAB's previous decision upholding the validity of claims in Netlist's '912 patent. On April 16, 2019, Google filed an appeal to this decision.

Inphi Litigation

On September 22, 2009, the Company filed a patent infringement lawsuit against Inphi Corporation ("Inphi") in the U.S. District Court for the Central District of California (the "Central District Court"). The complaint, as amended, alleges that Inphi is contributorily infringing and actively inducing the infringement of U.S. patents owned by the Company, including the '912 patent, U.S. Patent No. 7,532,537 (the "'537 patent"), which relates generally to memory modules with load isolation and memory domain translation capabilities, and U.S. Patent No. 7,636,274 (the "'274 patent"), which is related to the '537 patent and relates generally to load isolation and memory domain translation technologies. The Company is seeking damages and injunctive relief based on Inphi's use of the Company's patented technology. Inphi denied infringement and claimed that the three patents are invalid. In June 2010, Inphi requested and was later granted *Inter Partes* Reexaminations of the '912, '537 and '274 patents by the USPTO. The reexamination proceedings are described below (except for the reexamination proceeding related to the '537 patent, which have concluded with the confirmation of all of the claims of such patent). In connection with the reexamination requests, Inphi filed a motion to stay the patent infringement lawsuit with the Central District Court until completion of the reexamination proceedings, which was granted. On April 16, 2019, Inphi filed an appeal to the PTAB's January 31, 2019 decision upholding the validity of claims in Netlist's '912 patent.

'912 Patent Reexamination

As noted above, in April 2010, June 2010 and October 2010, Google and Inphi submitted requests for an *Inter Partes* Reexamination of the '912 patent by the USPTO, claiming that the '912 patent is invalid and requesting that the USPTO reject the patent's claims and cancel the patent. Additionally, in October 2010, Smart Modular, Inc. ("Smart Modular") submitted another such reexamination request. On January 18, 2011, the USPTO granted such reexamination requests, and in February 2011, the USPTO merged the Inphi, Google and Smart Modular '912 patent reexaminations into a single proceeding. On March 21, 2014, the USPTO issued an Action Closing Prosecution ("ACP"), an office action that states the USPTO examiner's position on patentability and closes further prosecution, and on June 18, 2014 the USPTO issued a Right of Appeal Notice ("RAN"), a notice that triggers the rights of the involved parties to file a notice of appeal to the ACP, each of which confirmed the patentability of 92 of the '912 patent's claims and rejected the patent's 11 other claims. The parties involved filed various notices of appeal, responses and requests, and on November 24, 2015, the PTAB held a hearing on such appeals. On May 31, 2016, the PTAB issued a decision affirming certain of the examiner's decisions and reversing others. On February 9, 2017, the PTAB granted the Company's request to reopen prosecution before the USPTO examiner and remanded the consolidated proceeding to the examiner to consider the patentability of certain of the pending claims in view of the PTAB's May 31, 2016 decision and comments from the parties. On October 3, 2017, the examiner issued a determination as to the patentability of certain of the pending claims, which were found to be unpatentable. On June 1, 2018, the PTAB reversed the Examiner and found the pending amended claims to be patentable. On July 2, 2018, Google requested rehearing of the PTAB's decision. On January 31, 2019 the PTAB, in response to Google's rehearing request, denied rehearing of the PTAB's previous decision upholding the validity of claims in Netlist's '912 patent. On April 16, 2019, Inphi and Google filed an appeal to the '912 patent decision. Accruals have not been recorded for loss contingencies related to the '912 patent reexamination proceedings because it is not probable that a loss has been incurred and the amount of any such loss cannot be reasonably estimated.

'627 Patent Reexamination

In September 2011, Smart Modular submitted a request for an *Inter Partes* Reexamination by the USPTO of the Company's U.S. Patent No. 7,864,627 (the "'627 patent"), related to the '912 patent, alleging that the '627 patent is invalid and requesting that the USPTO reject the patent's claims. On November 16, 2011, the USPTO granted Smart Modular's request and initiated reexamination. By June 27, 2014, the USPTO's patent examiner had rejected all of the '627 patent's claims. The Company appealed the examiner's rejections to the PTAB, and on May 31, 2016, the PTAB issued a decision affirming some of the examiner's rejections. On July 31, 2016, the Company submitted a request to the PTAB to reopen prosecution before the examiner to amend the claims. On February 9, 2017, the PTAB granted the Company's request to reopen prosecution and remanded the proceeding to the examiner to consider the patentability of the amended claims in view of the PTAB's May 31, 2016 decision and comments from Smart Modular. On October 2, 2017, the examiner issued a determination that the amended claims should also be rejected. On June 1, 2018, the PTAB

reversed the examiner and found the amended claims to be patentable. Smart Modular did not appeal this latest PTAB decision to the Federal Circuit. On October 3, 2018, the USPTO issued a Notice of Intent to Issue a Reexam Certificate, and on November 5, 2018, the USPTO issued Reexamination Certificate No. 7,864,627 concluding the reexamination. The original '627 patent had eighteen claims, and during the reexamination, five were canceled (claims 1, 4, 15, 19, 20) and the remaining fifteen were amended (claims 2, 3, 5-12, 14-18) into their current form as issued in the reexamination certificate. Accruals have not been recorded for loss contingencies related to the '627 patent reexamination proceedings because it is not probable that a loss has been incurred and the amount of any such loss cannot be reasonably estimated.

'274 Patent Reexamination

As noted above, in April 2010 and June 2010, Inphi submitted requests for an *Inter Partes* Reexamination of the '274 patent by the USPTO. On August 27, 2010, the request was granted. In March 2012 and June 2012, the USPTO issued an ACP and a RAN, respectively, each of which confirmed the patentability of many of the '274 patent's claims. The parties involved filed various notices of appeal, responses and requests, and on November 20, 2013, the PTAB held a hearing on such appeals. On January 16, 2014, the PTAB issued a decision affirming the examiner in part but reversing the examiner on new grounds and rejecting all of the patent's claims. On September 11, 2015, the USPTO examiner issued a determination rejecting the amended claims. On January 23, 2017, the USPTO granted-in-part the Company's petition to enter comments in support of its positions in the proceeding. On May 9, 2017, the PTAB issued a decision on appeal affirming the rejection of all claims. Netlist requested rehearing of the PTAB's decision on June 6, 2017. The PTAB denied the rehearing request on August 8, 2017. On October 6, 2017, Netlist appealed the decision to the Court of Appeals for the Federal Circuit, which Netlist dismissed on March 19, 2018, thereby terminating the proceedings with the rejection of all '274 patent claims becoming final. Accruals have not been recorded for loss contingencies related to the '274 patent reexamination proceedings because it is not probable that a loss has been incurred and the amount of any such loss cannot be reasonably estimated.

Smart Modular '295 Patent Litigation and Reexamination

On September 13, 2012, Smart Modular filed a patent infringement lawsuit against the Company in the U.S. District Court for the Eastern District of California (the "Eastern District Court"). The complaint alleges that the Company willfully infringes and actively induces the infringement of certain claims of U.S. Patent No. 8,250,295 ("the '295 patent") issued to Smart Modular and seeks damages and injunctive relief. The Company answered Smart Modular's complaint in October 2012, denying infringement of the '295 patent, asserting that the '295 patent is invalid and unenforceable, and asserting counterclaims against Smart Modular. Accruals have not been recorded for loss contingencies related to Smart Modular's complaint because it is not probable that a loss has been incurred and the amount of any such loss cannot be reasonably estimated.

On December 7, 2012, the USPTO granted the Company's request for the reexamination of the '295 patent. On April 29, 2014, the USPTO examiner issued an ACP confirming some claims and rejecting others, and on August 4, 2015, the examiner issued a RAN confirming all pending claims. On September 4, 2015, the Company appealed to the PTAB. The parties involved filed various notices of appeal, responses and requests, and on September 22, 2016, the PTAB held a hearing on such appeals. On November 14, 2016, the PTAB issued a decision reversing the examiner and rejected all of the pending claims. On January 23, 2017, Smart Modular filed a request to reopen prosecution. The parties had the opportunity present evidence and arguments and the examiner issued a determination on May 8, 2017, which found all pending claims to be unpatentable. On December 12, 2017, the PTAB agreed with the examiner and found all pending claims to be unpatentable. Smart Modular appealed the PTAB's decision to the Court of Appeals for the Federal Circuit. On March 28, 2018, the Eastern District Court stayed the proceedings related to the '295 patent. On January 18, 2019, the Company and Smart Modular filed a Joint Motion to Dismiss with Prejudice, terminating the proceedings related to the '295 patent in the Eastern District Court.

Smart Modular and SanDisk Litigation

On July 1 and August 23, 2013, the Company filed complaints against Smart Modular, SMART Storage Systems (which was subsequently acquired by SanDisk Corporation ("SanDisk")), Smart Worldwide Holdings ("Smart Worldwide") and Diablo Technologies ("Diablo") in the Central District Court, seeking, among other things, damages and other relief for alleged infringement of several of the Company's patents by the defendants based on the

manufacture and sale of the ULLtraDIMM memory module, alleged antitrust violations by Smart Modular and Smart Worldwide, and alleged trade secret misappropriation and trademark infringement by Diablo. More particularly, the Company asserted claims from U.S. Patent Nos. 7,881,150; 8,001,434; 8,081,536; 8,301,833; 8,359,501; 8,516,185; and 8,516,187 (the "Asserted Patents").

On August 23, 2013, Smart Modular and Diablo each filed a complaint in the Oakland Division of the Northern District Court seeking declaratory judgment of non-infringement and invalidity of the Asserted Patents. Based on various motions filed by the parties, on November 26, 2013, the Central District Court severed and transferred the patent claims related to the ULLtraDIMM memory module to the Northern District Court. On February 12, 2014, the Northern District Court granted the parties' joint stipulation dismissing all claims against Smart Modular without prejudice. On April 15, 2014, the Northern District Court granted the parties' joint stipulation dismissing all claims against Smart Worldwide without prejudice.

Between June 18, 2014 and August 23, 2014, SanDisk, Diablo, and Smart Modular filed numerous petitions in the USPTO requesting *Inter Partes* Review ("IPR") of the Company's Asserted Patents. On April 9, 2015, the Northern District Court stayed the proceedings as to the Company's patent infringement claims pending resolution of all outstanding IPRs. The trade secret misappropriation and trademark infringement claims against Diablo were fully adjudicated on August 17, 2016 (during the pendency of the IPR's) and are no longer pending.

All of the IPRs filed by SanDisk, Diablo and SMART Modular associated with the Asserted Patents with Patent Nos. ending in '185, '187 and '833 have been resolved in the Company's favor and are no longer pending. The IPRs associated with the Asserted Patents with Patent Nos. ending in '150, '434, '501 and '536, and the appeals therefrom, have also concluded, with the Board confirming the patentability of several asserted claims. The litigation, however, remains stayed pending resolution of IPRs filed by Hynix on the same or related patents. On December 8, 2017, Diablo filed for bankruptcy, and on November 9, 2018, the Northern District Court dismissed all claims against Diablo without prejudice. The Company's patent infringement claims as to all Asserted Patents remain pending against SMART Storage Systems and SanDisk, subject to the stay.

SK hynix Litigation

On September 1, 2016, the Company filed legal proceedings for patent infringement against SK hynix in the ITC (the "First ITC Action") and the Central District Court. These proceedings are based on the alleged infringement by SK hynix's RDIMM and LRDIMM enterprise memory products of six of the Company's U.S. patents. On October 31, 2017, the Company filed additional legal proceedings for patent infringement against SK hynix in the ITC (the "Second ITC Action") based on the alleged infringement by SK hynix's RDIMM and LRDIMM products of two additional U.S. patents owned by the Company. In all of the ITC proceedings, the Company has requested exclusion orders that direct U.S. Customs and Border Protection to stop allegedly infringing SK hynix RDIMM and LRDIMM products from entering the United States. In the Central District Court proceedings, the Company is primarily seeking damages.

On October 3, 2016, the ITC instituted an investigation of the trade practices of SK hynix and certain of its subsidiaries in connection with the First ITC Action, and held a hearing on the merits of the investigation from May 8, 2017 until May 11, 2017. On November 14, 2017, the ITC issued a final initial determination for the First ITC Action, finding no infringement of the asserted patents and no violation of Section 337 of the Tariff Act, and on January 16, 2018, the ITC issued a final determination for the First ITC Action, affirming the findings of no infringement and no violation and terminating the investigation. The Company appealed this final determination to the Court of Appeals for the Federal Circuit with oral arguments occurring on December 5, 2019. On December 12, 2019, the Court of Appeals for the Federal Circuit affirmed the invalidity ruling by the PTAB involving the patents in litigation at the first ITC Action and dismissed the appeal of the final determination of the first ITC Action as moot.

On January 11, 2018, the ITC set a 19-month target date of July 3, 2019 for an investigation related to the Second ITC Action, with a final initial determination for the Second ITC Action being filed no later than March 1, 2019. Based on this target date, the ITC scheduled a hearing on the merits of the investigation related to the Second ITC Action to begin on November 9, 2018 and conclude on November 19, 2018. On April 12, 2018, the ITC granted SK hynix's motion for summary determination of non-infringement and terminated the Second ITC Action in its entirety.

On April 23, 2018, the Company filed a petition seeking ITC review of this decision. On May 29, 2018, the ITC Commission remanded the Second ITC Action back to the Administrative Law Judge ("ALJ") to resolve the parties' claim construction disputes and continue the investigation. On June 14, 2018, the ITC extended the target date for the final determination to August 5, 2019, with a final initial determination due by April 5, 2019. Based on this extended target date, the ITC scheduled a hearing on the merits to begin on December 14, 2018 and conclude on December 21, 2018. On September 13, 2018, the ITC rescheduled the hearing on the merits to begin on January 14, 2019 and conclude on January 18, 2019. On January 29, 2019, due to the government shutdown, the ITC again rescheduled the hearing on the merits to begin on March 11, 2019 and conclude on March 15, 2019. On February 8, 2019 Chief Administrative Law Judge of the ITC issued an Order in Investigation No. 337-TA-1089 denying SK hynix's motion for "Summary Determination of Non Infringement of Netlist's U.S. Patent No. 9,535,623 Based On Issue Preclusion." On March 12, 2019, the ALJ postponed the trial due to reasons unrelated to the dispute between the parties. The trial recommenced on July 15, 2019 and ended on July 19, 2019. On October 21, 2019, the ITC issued an initial determination for the Second ITC Action, finding infringement by SK hynix of asserted Netlist U.S. Patent No. 9,606,907 (the "'907 Patent") resulting in a violation of Section 337 of the Tariff Act. On January 31, 2020, the ITC issued a Notice of Commission Determination regarding Investigation No. 337-TA-1089, which stated the ITC would review in part the positive Final Initial Determination and extended the target date for completion of the Investigation from February 21, 2020 to April 7, 2020.

Between December 30, 2016 and January 20, 2017, SK hynix filed numerous petitions in the USPTO requesting IPR of certain of the Company's patents, including the patents asserted in the First ITC Action and the Central District Court proceedings, which have now concluded and certain of which are now on appeal to the Court of Appeals for the Federal Circuit. Between December 19, 2017 and February 7, 2018, SK hynix filed additional petitions in the USPTO requesting IPR of the patents asserted in the Second ITC Action, which are now proceeding. On March 21, 2019, the PTAB issued a Final Written Decision finding Netlist's U.S. Patent No. 9,535,623 invalid. Netlist has filed notice of intent to appeal. On June 27, 2019, the PTAB issued Final Written Decisions on two IPR proceedings regarding Netlist's U.S. Patent No. 9,606,907 (the "'907 Patent") based on the reference Ellsberry, holding that claims 1-39 and 42-65 of the '907 Patent are unpatentable, but claims 40 and 41 are not unpatentable. On July 12, 2019, Netlist filed a Motion to Terminate under 35 U.S.C. § 315(e)(1) the remaining two IPR proceedings regarding the '907 Patent based on the references Halbert and Amidi. On July 19, 2019, SK hynix filed and served their opposition to Netlist's Motion To Terminate. The PTAB issued a decision to Terminate IPR IPR2018-0036 on August 5, 2019.

On July 17, 2017, the Central District Court granted in part SK hynix's request to stay the infringement proceedings pending further order of the court.

On July 11, 2017, the Company filed legal proceedings for patent infringement against SK hynix and certain of its distributors in the courts of Germany and the PRC based on the alleged infringement by SK hynix's LRDIMM products of certain of the Company's patents in those jurisdictions. On January 25, 2018, the court in Germany held a preliminary hearing and then held the trial on December 6, 2018. In December 2017, SK hynix filed petitions challenging the validity of the patents asserted by the Company in Germany and the PRC. On June 3, 2018, the patent asserted in the PRC was found to be invalid. On June 19, 2018, the Company withdrew the patent infringement suits filed in the PRC. On January 31, 2019, the court in Germany dismissed the infringement action, and ordered the Company to bear the costs of the action. Netlist has elected not to appeal the German court's finding.

Other Contingent Obligations

In the ordinary course of its business, the Company has made certain indemnities, commitments and guarantees pursuant to which it may be required to make payments in relation to certain transactions. These include, among others: (i) intellectual property indemnities to the Company's customers and licensees in connection with the use, sale and/or license of Company products; (ii) indemnities to vendors and service providers pertaining to claims based on the Company's negligence or willful misconduct; (iii) indemnities involving the accuracy of representations and warranties in certain contracts; (iv) indemnities to directors and officers of the Company to the maximum extent permitted under the laws of the State of Delaware; (v) indemnities to TRGP, SVIC, SVB and Iliad pertaining to all obligations, demands, claims, and liabilities claimed or asserted by any other party in connection with transactions contemplated by the applicable investment or loan documents, as applicable; and (vi) indemnities or other claims related to certain real estate

leases, under which the Company may be required to indemnify property owners for environmental and other liabilities or may face other claims arising from the Company's use of the applicable premises. The duration of these indemnities, commitments and guarantees varies and, in certain cases, may be indefinite. The majority of these indemnities, commitments and guarantees do not provide for any limitation of the maximum potential for future payments the Company could be obligated to make. Historically, the Company has not been obligated to make significant payments as a result of these obligations, and no liabilities have been recorded for these indemnities, commitments and guarantees in the accompanying consolidated balance sheets.

Note 9—Stockholders' Equity

Serial Preferred Stock

The Company's authorized capital stock includes 10,000,000 shares of serial preferred stock, with a par value of $0.001 per share. No shares of preferred stock were outstanding at December 28, 2019 or December 29, 2018.

On April 17, 2017, the Company entered into a rights agreement (the "Rights Agreement") with Computershare Trust Company, N.A., as rights agent. In connection with the adoption of the Rights Agreement and pursuant to its terms, the Company's board of directors authorized and declared a dividend of one right (each, a "Right") for each outstanding share of the Company's common stock to stockholders of record at the close of business on May 18, 2017 (the "Record Date"), and authorized the issuance of one Right for each share of the Company's common stock issued by the Company (except as otherwise provided in the Rights Agreement) between the Record Date and the Distribution Date (as defined below).

Each Right entitles the registered holder, subject to the terms of the Rights Agreement, to purchase from the Company, when exercisable and subject to adjustment, one unit consisting of one one-thousandth of a share (a "Unit") of Series A Preferred Stock of the Company (the "Preferred Stock"), at a purchase price of $6.56 per Unit, subject to adjustment. Subject to the provisions of the Rights Agreement, including certain exceptions specified therein, a distribution date for the Rights (the "Distribution Date") will occur upon the earlier of (i) 10 business days following a public announcement that a person or group of affiliated or associated persons (an "Acquiring Person") has acquired or otherwise obtained beneficial ownership of 15% or more of the then-outstanding shares of the Company's common stock, and (ii) 10 business days (or such later date as may be determined by the Company's board of directors) following the commencement of a tender offer or exchange offer that would result in a person or group becoming an Acquiring Person. The Rights are not exercisable until the Distribution Date and, unless earlier redeemed or exchanged by the Company pursuant to the terms of the Rights Agreement, will expire on the earlier of (i) the close of business on April 17, 2018, the first anniversary of the adoption of the Rights Agreement, and (ii) the date of any settlement, adjudication, dismissal with prejudice, abandonment by the Company or other conclusive and final resolution of the Company's legal proceedings against SK hynix (see Note 8).

On April 16, 2018, the Company entered into an amendment (the "Amendment") to the Rights Agreement, which amended the definition of "Expiration Date" in the Rights Agreement to incorporate all of the Company's legal proceedings against SK hynix, and amends the definition of "Final Expiration Date" in the Rights Agreement to mean the close of business on April 17, 2019. On April 17, 2019, the Company entered into a second amendment (the "Second Amendment") to the Rights Agreement, which further amended the definition of "Expiration Date" in the Rights Agreement to extend the final expiration for an additional two years to April 17, 2021. As a result, the Rights will expire and become unexercisable on or before the close of business on April 17, 2021.

In connection with the adoption of the Rights Agreement, the Company's board of directors approved a Certificate of Designation of the Series A Preferred Stock (the "Certificate of Designation") designating 1,000,000 shares of the Company's serial preferred stock as Series A Preferred Stock and setting forth the rights, preferences and limitations of the Preferred Stock. The Company filed the Certificate of Designation with the Secretary of State of the State of Delaware on April 17, 2017.

Common Stock

The Company has one class of common stock with a par value of $0.001 per share. On August 15, 2018, the Company's stockholders approved an amendment to the Restated Certificate of Incorporation to increase the number of shares of the common stock authorized for issuance from 150,000,000 to 300,000,000.

2017 ATM Program

On November 14, 2017, the Company entered into the Sales Agreement with the Agent to sell shares of its common stock, with aggregate gross proceeds of up to $9.0 million, from time to time, through the ATM Program. Under the Sales Agreement, the Company set the parameters for the sale of shares, including the number of shares to be issued, the time period during which sales were requested to be made, limitation on the number of shares that could be sold in any one trading day and any minimum price below which sales could be made. On August 29, 2018, the Company completed the offering under the ATM Program after raising net proceeds of approximately $8.6 million through the sale of 40,680,368 shares of its common stock, after deducting sales commissions and other offering expenses paid by the Company. During the year ended December 29, 2018, the Company received net proceeds of approximately $5.8 million through the sale of 31,786,146 shares of its common stock, after deducting sales commissions and other offering expenses paid by the Company.

Share Purchase Agreement

On May 17, 2018, the Company entered into a Board approved arm's length Share Purchase Agreement with a trust controlled by C.K. Hong, its President, Chief Executive Officer and Chairman of the Board, pursuant to which the Company sold to the trust 5,405,405 shares of its common stock, par value $0.001 per share, at a price per share of $0.148 (the closing price of its common stock as of the signing of the purchase agreement). The net proceeds received by the Company were $0.8 million.

2018 Offering

On September 12, 2018, the Company entered into a Securities Purchase Agreement with certain investors, pursuant to which the Company issued and sold to the investors in a registered offering ("2018 Offering") an aggregate of 22,222,220 shares of its common stock and warrants to purchase up to an aggregate of 11,111,110 shares of its common stock at a per share purchase price of $0.45 per share (see below *Warrants*). The 2018 Offering closed on September 14, 2018. The net proceeds to the Company from the 2018 Offering were approximately $9.2 million, after deducting placement agent fees and offering costs paid by the Company. The warrant has a term of five years commencing on the date when it first became exercisable on March 14, 2019 (181 days following the date of its issuance) and has an exercise price of $0.655 per share. The exercise price and the number of warrant shares issuable upon exercise of warrant are subject to adjustment in the event of, among other things, certain transactions affecting the Company's common stock (including without limitation stock splits and stock dividends), and certain fundamental transactions (including without limitation a merger or other sale-of-company transaction).

2019 Lincoln Park Purchase Agreement

On June 24, 2019, the Company entered into the 2019 Purchase Agreement with Lincoln Park, pursuant to which the Company has the right to sell to Lincoln Park up to an aggregate of $10 million in shares of its common stock subject to the conditions and limitations set forth in the 2019 Purchase Agreement. As consideration for entering into the 2019 Purchase Agreement, the Company issued to Lincoln Park 818,420 shares of its common stock as initial commitment shares in a noncash transaction on June 24, 2019 and will issue up to 818,420 additional shares of its common stock as additional commitment shares on a pro rata basis in connection with any additional purchases. The Company will not receive any cash proceeds from the issuance of these additional commitment shares.

Pursuant to the 2019 Purchase Agreement, on any business day and as often as every other business day over the 36-month term of the 2019 Purchase Agreement, the Company has the right, from time to time, at its sole discretion and subject to certain conditions, to direct Lincoln Park to purchase up to 400,000 shares of its common stock, with such

amount increasing as the closing sale price of its common stock increases; provided Lincoln Park's obligation under any single such purchase would not exceed $1.0 million, unless the Company and Lincoln Park mutually agree to increase the maximum amount of such single regular purchase. If the Company directs Lincoln Park to purchase the maximum number of shares of common stock it then may sell in a regular purchase, then in addition to such regular purchase, and subject to certain conditions and limitations in the 2019 Purchase Agreement, the Company may direct Lincoln Park to purchase an additional amount of common stock that may not exceed the lesser of (i) 300% of the number of shares purchased pursuant to the corresponding regular purchase or (ii) 30% of the total number of shares of its common stock traded during a specified period on the applicable purchase date as set forth in the 2019 Purchase Agreement. Under certain circumstances and in accordance with the 2019 Purchase Agreement, the Company may direct Lincoln Park to purchase shares in multiple accelerated purchases on the same trading day.

During the year ended December 28, 2019, Lincoln Park purchased an aggregate of 19,044,762 shares of the Company's common stock for a net purchase price of $6.4 million. In connection with the purchases, the Company issued to Lincoln Park an aggregate of 523,633 shares of its common stock as additional commitment shares in noncash transactions.

The Company controls the timing and amount of any sales of its common stock to Lincoln Park. There is no upper limit on the price per share that Lincoln Park must pay for the Company's common stock under the 2019 Purchase Agreement, but in no event will shares be sold to Lincoln Park on a day the closing price is less than the floor price specified in the 2019 Purchase Agreement. In all instances, the Company may not sell shares of its common stock to Lincoln Park under the 2019 Purchase Agreement if that will result in Lincoln Park beneficially owning more than 9.99% of its common stock.

The 2019 Purchase Agreement does not limit the Company's ability to raise capital from other sources at the Company's sole discretion, except that, subject to certain exceptions, the Company may not enter into any Variable Rate Transaction (as defined in the 2019 Purchase Agreement, including the issuance of any floating conversion rate or variable priced equity-like securities) during the 36 months after the date of the 2019 Purchase Agreement. The Company has the right to terminate the 2019 Purchase Agreement at any time, at no cost to the Company.

2020 Lincoln Park Purchase Agreement

On March 5, 2020, the Company entered into the 2020 Purchase Agreement with Lincoln Park, pursuant to which the Company has the right to sell to Lincoln Park up to an aggregate of $20 million in shares of its common stock over the 36-month term of the 2020 Purchase Agreement subject to the conditions and limitations set forth in the 2020 Purchase Agreement. As consideration for entering into the 2020 Purchase Agreement, the Company issued to Lincoln Park 1,529,052 shares of its common stock as initial commitment shares in a noncash transaction on March 6, 2020 and will issue up to 917,431 additional shares of its common stock as additional commitment shares on a pro rata basis in connection with any additional purchases. The Company will not receive any cash proceeds from the issuance of these additional commitment shares.

Pursuant to the 2020 Purchase Agreement, on any business day and as often as every other business day over the 36-month term of the 2020 Purchase Agreement, the Company has the right, from time to time, at its sole discretion and subject to certain conditions, to direct Lincoln Park to purchase up to 400,000 shares of its common stock, with such amount increasing as the closing sale price of its common stock increases; provided Lincoln Park's obligation under any single such purchase will not exceed $1.0 million, unless the Company and Lincoln Park mutually agree to increase the maximum amount of such single regular purchase. If the Company directs Lincoln Park to purchase the maximum number of shares of common stock it then may sell in a regular purchase, then in addition to such regular purchase, and subject to certain conditions and limitations in the 2020 Purchase Agreement, the Company may direct Lincoln Park to purchase an additional amount of common stock that may not exceed the lesser of (i) 300% of the number of shares purchased pursuant to the corresponding regular purchase or (ii) 30% of the total number of shares of its common stock traded during a specified period on the applicable purchase date as set forth in the 2020 Purchase Agreement. Under certain circumstances and in accordance with the 2020 Purchase Agreement, the Company may direct Lincoln Park to purchase shares in multiple accelerated purchases on the same trading day.

The Company controls the timing and amount of any sales of its common stock to Lincoln Park. There is no upper limit on the price per share that Lincoln Park must pay for the Company's common stock under the 2020 Purchase Agreement, but in no event will shares be sold to Lincoln Park on a day the closing price is less than the floor price specified in the 2020 Purchase Agreement. In all instances, the Company may not sell shares of its common stock to Lincoln Park under the 2020 Purchase Agreement if that will result in Lincoln Park beneficially owning more than 9.99% of its common stock.

The 2020 Purchase Agreement does not limit the Company's ability to raise capital from other sources at the Company's sole discretion, except that, subject to certain exceptions, the Company may not enter into any Variable Rate Transaction (as defined in the 2020 Purchase Agreement, including the issuance of any floating conversion rate or variable priced equity-like securities) during the 36 months after the date of the 2020 Purchase Agreement. The Company has the right to terminate the 2020 Purchase Agreement at any time, at no cost to the Company.

Warrants

In April and July 2018, the Company issued warrants to purchase up to 50,000 shares and 150,000 shares of its common stock at an exercise price of $0.25 to $0.15 per share, respectively, to a consulting firm as partial consideration for their services rendered. Separately, in July 2018, the Company issued warrants to purchase up to 300,000 shares of its common stock at an exercise price of $0.11 per share to a software development company as partial consideration to enter into a joint software development agreement. The aggregate fair value of the warrants issued to these firms, calculated using the Black-Scholes option pricing model, was not significant. In September 2018, in connection with the 2018 Offering, the Company issued warrants to purchase up to an aggregate of 11,111,110 shares of its common stock at a per share purchase price of $0.655 per share. As of December 28, 2019, there were outstanding warrants to purchase an aggregate of 15,010,012 shares of the Company's common stock with a weighted-average exercise price of $0.62. There were no activities during the year ended December 28, 2019.

Note 10—Stock-Based Awards

The Company's Amended and Restated 2006 Equity Incentive Plan (the "Amended 2006 Plan") provides for broad-based equity grants to its employees and non-employee service providers. The Company also periodically grants equity-based awards outside the Amended 2006 Plan to certain new hires as an inducement to enter into employment with the Company. Subject to certain adjustments, as of December 28, 2019, the Company was authorized to issue a maximum of 13,805,566 shares of its common stock pursuant to awards granted under the Amended 2006 Plan. Pursuant to the terms of the Amended 2006 Plan, beginning January 1, 2017, the automatic annual increase to the number of shares of common stock that may be issued pursuant to awards granted under the Amended 2006 Plan is equal to the lesser of (i) 2.5% of the number of shares of common stock issued and outstanding as of the first day of the applicable calendar year, and (ii) 1,200,000 shares of common stock, subject to adjustment for certain corporate actions. As of December 28, 2019, the Company had 1,101,572 shares of common stock available for issuance pursuant to future awards to be granted under the Amended 2006 Plan.

Stock Options

Stock options granted under the Amended 2006 Plan generally vest at a rate of at least 25% per year over four years and expire 10 years from the date of grant. The weighted-average assumptions used in the Black-Scholes option pricing model and the resulting weighted-average grant date fair value of stock options granted were as follows:

	Year Ended	
	December 28, 2019	December 29, 2018
Expected term (in years)	6.06	6.20
Expected volatility	108 %	108 %
Risk-free interest rate	1.92 %	2.75 %
Expected dividends	$ —	$ —
Weighted-average grant date fair value per share	$ 0.29	$ 0.21

The following table summarizes the activity related to stock options during the year ended December 28, 2019:

	Number of Shares (in thousands)	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 29, 2018	8,186	$ 1.18	5.88	$ 223
Granted	790	$ 0.35		
Exercised	(175)	$ 0.28		
Expired or forfeited	(1,444)	$ 0.89		
Outstanding at December 28, 2019	7,357	$ 1.17	5.54	$ 127
Exercisable at December 28, 2019	5,799	$ 1.37	4.69	$ 49
Vested and expected to vest at December 28, 2019	7,097	$ 1.20	5.41	$ 114

There was no significant intrinsic value of options exercised during the years ended December 28, 2019 and December 29, 2018.

Restricted Stock Awards and Restricted Stock Units

RSAs granted under the Amended 2006 Plan vest annually on each anniversary of the grant date over a two-year term. RSUs granted for employees and consultants generally vest semi-annually from the grant date over a four-year term, and RSUs granted for independent directors fully-vest on the grant date. The following table summarizes the activity related to RSAs and RSUs during the year ended December 28, 2019:

	Number of Shares (in thousands)	Weighted-Average Grant-Date Fair Value per Share
Balance nonvested at December 29, 2018	525	$ 0.25
Granted	3,727	$ 0.55
Vested	(1,012)	$ 0.47
Forfeited	(174)	$ 0.54
Balance nonvested at December 28, 2019	3,066	$ 0.52

Stock-Based Compensation

The following table summarizes the stock-based compensation expense by line item in the consolidated statements of operations (in thousands):

	Year Ended	
	December 28, 2019	December 29, 2018
Cost of sales	$ 26	$ 26
Research and development	213	236
Selling, general and administrative	750	475
Total	$ 989	$ 737

As of December 28, 2019, the Company had approximately $1.6 million, net of estimated forfeitures, of unearned stock-based compensation, which it expects to recognize over a weighted-average period of approximately 2.9 years.

Note 11—Defined Contribution Plan

The Company has a defined contribution plan under Section 401(k) of the Code ("401(k)") covering full-time domestic employees who meet certain eligibility requirements. Under the 401(k) plan, eligible employees may contribute up to 100% of their eligible compensation on either a pre-tax or after-tax Roth 401(k) basis, or up to the annual maximum allowed by the IRS. The Company may make matching contributions on the contributions of a participant on a discretionary basis. During the year ended December 28, 2019, the Company did not make any matching contributions. For the year ended December 29, 2018, the contribution expense was insignificant.

Note 12—Major Customers, Suppliers and Products

The Company's net sales have historically been concentrated in a small number of customers. The following table sets forth the percentage of net sales made to customers that each comprise 10% or more of total net sales:

	Year Ended	
	December 28, 2019	December 29, 2018
Customer A	* %	18 %

* Less than 10% of total net sales

As of December 28, 2019, one customer represented approximately 25% of aggregate gross accounts receivable. As of December 29, 2018, two customers represented approximately 22% and 15% of aggregate gross accounts receivable, respectively. The loss of any of the Company's significant customers or a reduction in sales to or difficulties collecting payments from any of these customers could significantly reduce the Company's net sales and adversely affect its operating results. The Company mitigates risks associated with foreign receivables by purchasing comprehensive foreign credit insurance.

The Company resells certain component products to end-customers that are not reached in the distribution models of the component manufacturers, including storage customers, appliance customers, system builders and cloud and datacenter customers. For the years ended December 28, 2019 and December 29, 2018, resales of these products represented approximately 77% and 75%, respectively, of the Company's net sales.

The Company's purchases are typically concentrated in a small number of suppliers. The following table shows the percentage of purchases made from suppliers that each comprise 10% or more of total purchases:

	Year Ended	
	December 28, 2019	December 29, 2018
Supplier A	37 %	13 %
Supplier B	17 %	* %
Supplier C	* %	17 %
Supplier D	* %	15 %

* Less than 10% of purchases during the period

While the Company believes alternative suppliers may be available, its dependence on a small number of suppliers and the lack of any guaranteed sources for the essential components of its products and the components it resells exposes the Company to several risks, including the inability to obtain an adequate supply of these components, increases in their costs, delivery delays and poor quality. If the Company is not able to obtain these components in the amounts needed on a timely basis and at commercially reasonable prices, it may not be able to develop or introduce new products, it may experience significant increases in its cost of sales if it is forced to procure components from alternative suppliers and is not able to negotiate favorable terms with these suppliers, it may experience interruptions or failures in the delivery of its products, or it may be forced to cease sales of products dependent on the components or resales of the components it resells to customers directly. Any of these events could have a material adverse effect on the Company's business, operating results and financial condition.

Exhibit 4.1

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

The following is a description of the common stock, par value $0.001 per share (the "Common Stock"), and the series A preferred stock purchase rights of Netlist, Inc. (the "Company," "we," "us," or "our") which are the securities of the Company registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act").

DESCRIPTION OF CAPITAL STOCK

The following description of our capital stock is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to our restated certificate of incorporation, as amended (the "Certificate of Incorporation") and our amended and restated bylaws, as amended (the "Bylaws"), each of which is incorporated herein by reference as an exhibit to the Annual Report on Form 10-K filed with the Securities and Exchange Commission, of which this Exhibit 4. 1 is a part. We encourage you to read our Certificate of Incorporation, our Bylaws and the applicable provisions of the General Corporation Law of the State of Delaware (the "DGCL") for additional information.

Authorized Capital Stock

Our authorized capital stock consists of 300,000,000 shares of Common Stock and 10,000,000 shares of serial preferred stock, par value $0.001 per share. Our board of directors has designated and authorized the issuance of a series of up to 1,000,000 shares of our serial preferred stock as Series A Preferred Stock.

Common Stock

Fully Paid and non-assessable. All outstanding shares of our Common Stock are fully paid and non-assessable.

Voting Rights. Holders of our Common Stock are entitled to one vote per share on all matters voted on by the shareholders, including the election of directors. Our Common Stock does not have cumulative voting rights.

Dividend Rights. Subject to any preferential dividend rights granted to the holders of any shares of our preferred stock that may at the time be outstanding, holders of our Common Stock are entitled to receive dividends as may be declared from time to time by our board of directors out of funds legally available therefor.

Liquidation Rights. Upon liquidation, dissolution or winding-up, the holders of our Common Stock are entitled to receive, after payment or provision for payment of all of our debts and liabilities, all of our assets available for distribution subject to the prior rights of any holders of preferred stock then outstanding.

No Preemptive and Similar Rights. Our Common Stock has no preemptive or other subscription rights, and there are no conversion rights or redemption or sinking fund provisions with respect to such shares of Common Stock.

Listing. Our Common Stock is listed and traded on the OTCQX Best Market under the symbol "NLST."

Preferred Stock

Under our Certificate of Incorporation, without further stockholder action, our board of directors is authorized, subject to any limitations prescribed by the DGCL to provide for the issuance of the shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the designation, powers, preferences and rights of the shares of each such series and any qualifications, limitations or restrictions thereof, and to increase or decrease the number of shares of any such series (but not below the number of shares of such series then outstanding).

Series A Preferred Stock Purchase Rights

On April 17, 2017, we entered into a rights agreement (the "Rights Agreement") with Computershare Trust Company, N.A., as rights agent. In connection with the adoption of the Rights Agreement and pursuant to its terms, our board of directors authorized and declared a dividend of one right (each, a "Right") for each outstanding share of our Common Stock to stockholders of record at the close of business on May 18, 2017 (the "Record Date"), and authorized the issuance of one Right for each share of Common Stock issued by us (except as otherwise provided in the Rights Agreement) between the Record Date and the Distribution Date (as defined below).

Each Right entitles the registered holder, subject to the terms of the Rights Agreement, to purchase from us, when exercisable and subject to adjustment, one unit consisting of one one-thousandth of a share (a "Unit") of Series A Preferred Stock, par value $0.001 per share, at a purchase price of $6.56 per Unit, subject to adjustment. Subject to the provisions of the Rights Agreement, including certain exceptions specified therein, a distribution date for the Rights (the "Distribution Date") will occur upon the earlier of (i) 10 business days (or such later date as may be determined by our board of directors) following a public announcement that a person or group of affiliated or associated persons (an "Acquiring Person") has acquired or otherwise obtained beneficial ownership of 15% or more of the then-outstanding shares of our Common Stock, and (ii) 10 business days (or such later date as may be determined by our board of directors) following the commencement of a tender offer or exchange offer that would result in a person or group becoming an Acquiring Person. The Rights are not exercisable until the Distribution Date and, unless earlier redeemed or exchanged by us pursuant to the terms of the Rights Agreement, will expire on the close of business on April 17, 2021.

In connection with the adoption of the Rights Agreement, our board of directors approved a Certificate of Designation of the Series A Preferred Stock (the "Certificate of Designation") designating 1,000,000 shares of our serial preferred stock as Series A Preferred Stock and setting forth the rights, preferences and limitations of the Series A Preferred Stock.

The above summary of the Rights, the Rights Agreement and Series A Preferred Stock does not purport to be complete. You should refer to the Rights Agreement, as amended, and the Certificate of Designation which are included as an exhibit to the Annual Report on Form 10-K.

Certain Provisions of Our Certificate of Incorporation, Bylaws

Our Certificate of Incorporation and Bylaws vest the power to call special meetings of stockholders at any time in the chairman of the board, President or the board of directors.

To be properly brought before an annual meeting of stockholders, (i) any stockholder nomination for the board of directors must be delivered to our Secretary not later than 90 days prior to the date of the annual meeting, and (ii) any stockholder proposal other than nominations for our board of directors must be delivered to our Secretary not less than 120 days or more than 180 days prior to the first anniversary of the date on which we first released our proxy materials (or, in the absence of proxy materials, its notice of meeting) for the previous year's annual meeting of stockholders. However, if we did not hold an annual meeting the previous year, or if the date of the annual meeting is advanced more than 30 days prior to or delayed by more than 30 days after the anniversary of the preceding year's annual meeting, then to be timely, notice by the stockholder must be delivered to the Secretary not later than the close of business on the later of (i) the 90th day prior to such annual meeting or (ii) the 15th day following the day on which public announcement of the date of such meeting is first made. Such notice must contain information specified in the Bylaws as to the director nominee or proposal of other business, information about the stockholder making the nomination or proposal and the beneficial owner, if any, on behalf of whom the nomination or proposal is made, including name and address, class and number of shares owned, and representations regarding the intention to make such a proposal or nomination and to solicit proxies in support of it. With respect to director nominees, we may require any proposed nominee to furnish information concerning his or her eligibility to serve as our director.

Unless otherwise provided in our Certificate of Incorporation, our stockholders may not act by written consent.

Certain Anti-Takeover Effects of Delaware Law

We are subject to Section 203 of the DGCL. In general, Section 203 of the DGCL prohibits a publicly held Delaware corporation from engaging in various business combination transactions with any interested stockholder for a period of three years following the time that such person became an interested stockholder, unless:

- the business combination or the transaction which resulted in the stockholder becoming an interested stockholder is approved by the board of directors prior to the time the interested stockholder obtained such status;

- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding those shares owned (i) by persons who are directors and also officers and (ii) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or

- at or subsequent to such time the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders by the affirmative vote of at

least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

A “business combination” is defined to include mergers, asset sales, and other transactions resulting in financial benefit to a stockholder. In general, an “interested stockholder” is a person who owns (or is an affiliate or associate of the corporation and, within the prior three years, did own) 15% or more of the corporation’s voting stock or any entity or person affiliated with or controlling or controlled by such entity or person. The statute could prohibit or delay mergers or other takeover or change in control attempts with respect to our company and, accordingly, may discourage attempts to acquire us even though such a transaction may offer our stockholders the opportunity to sell their stock at a price above the prevailing market price.

Exhibit 5.1

3580 Carmel Mountain Road
Suite 300
San Diego, CA 92130
858 314 1500
mintz.com

March 10, 2020

Netlist, Inc.
175 Technology Drive, Suite 150
Irvine, California 92618

Re: **Securities Registered under Registration Statement on Form S-3**

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-3 (File No. 333-228348) (as amended or supplemented, the "Registration Statement") filed on November 13, 2018 with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), relating to the registration of the offer by Netlist, Inc., a Delaware corporation (the "Company") of up to $50,000,000 of any combination of securities of the types specified therein, that was declared effective by the Commission on November 28, 2018. Reference is made to our opinion letter dated November 13, 2018 and included as Exhibit 5.1 to the Registration Statement. We are delivering this supplemental opinion letter in connection with the prospectus supplement (the "Prospectus Supplement") filed on March 9, 2020 by the Company with the Commission pursuant to Rule 424 under the Securities Act. The Prospectus Supplement relates to the offering by the Company of (i) up to $20,000,000 aggregate offering amount of shares of the Company's Common Stock, par value $0.001 per share, and (ii) up to 2,446,483 shares of the Company's Common Stock, par value $0.001 per share ((i) and (ii) together, the "Shares") covered by the Registration Statement. We understand that the Shares are to be offered and sold in the manner described in the Prospectus Supplement pursuant to a Purchase Agreement between the Company and Lincoln Park Capital Fund, LLC (the "Purchase Agreement").

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions set forth below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinions set forth below, on certificates of officers of the Company.

The opinion set forth below is limited to the Delaware General Corporation Law (which includes reported judicial decisions interpreting the Delaware General Corporation Law).

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the Purchase Agreement, will be validly issued, fully paid and non-assessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement and to the references to our firm under the caption "Legal Matters" in the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ Mintz, Levin, Cohn, Ferris Glovsky & Popeo, P.C.

MINTZ, LEVIN, COHN, FERRIS, GLOVSKY & POPEO, P.C

Exhibit 10.26

AMENDMENT
TO
LOAN AND SECURITY AGREEMENT

THIS **AMENDMENT TO LOAN AND SECURITY AGREEMENT** (this "Amendment") is entered into as of February 27, 2020, by and between SILICON VALLEY BANK ("Bank" or "Silicon") and NETLIST, INC., a Delaware corporation ("Borrower"). Borrower's chief executive office is located at 175 Technology Drive, Suite 150, Irvine, CA 92618

RECITALS

A. Bank and Borrower are parties to that certain Loan and Security Agreement with an Effective Date of October 31, 2009 (as the same may from time to time be amended, modified, supplemented or restated, 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 (i) extend the Revolving Line Maturity Date and (ii) make certain other revisions to the Loan Agreement as more fully set forth herein.

D. Bank has agreed to so amend certain provisions of the Loan Agreement and to provide its consent, 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, effective as of the date hereof:

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

2. Amendments to Loan Agreement.

2.1 Modified Definition of Revolving Line Maturity Date. The definition of "Revolving Line Maturity Date" set forth in Section 13.1 of the Loan Agreement is hereby deleted in its entirety and replaced with the following:

"**Revolving Line Maturity Date**" is April 30, 2021.

2.2 Modified Exhibit B. The Compliance Certificate attached to the Loan Agreement as Exhibit B is hereby deleted in its entirety and replaced with the Compliance

Certificate attached hereto as **Schedule 1**.

3. Limitation of Amendments.

3.1 The amendments set forth in Section 2, above, are 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 Documents, as amended by this Amendment;

4.3 The organizational documents of Borrower delivered to Bank on 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 Documents, 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 Documents, 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 Documents, 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. Release by Borrower. Borrower hereby agree as follows:

5.1 FOR GOOD AND VALUABLE CONSIDERATION, Borrower hereby forever relieves, releases, and discharges Bank and its present or former employees, officers, directors, agents, representatives, attorneys, and each of them, from any and all claims, debts, liabilities, demands, obligations, promises, acts, agreements, costs and expenses, actions and causes of action, of every type, kind, nature, description or character whatsoever, whether known or unknown, suspected or unsuspected, absolute or contingent, arising out of or in any manner whatsoever connected with or related to facts, circumstances, issues, controversies or claims existing or arising from the beginning of time through and including the date of execution of this Amendment (collectively "**Released Claims**"). Without limiting the foregoing, the Released Claims shall include any and all liabilities or claims arising out of or in any manner whatsoever connected with or related to the Loan Documents, the Recitals hereto, any instruments, agreements or documents executed in connection with any of the foregoing or the origination, negotiation, administration, servicing and/or enforcement of any of the foregoing.

5.2 In furtherance of this release, Borrower expressly acknowledges and waives any and all rights under Section 1542 of the California Civil Code, which provides as follows:

> **"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR EXPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT, IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY."** (Emphasis added.)

5.3 By entering into this release, Borrower recognizes that no facts or representations are ever absolutely certain and it may hereafter discover facts in addition to or different from those which it presently knows or believes to be true, but that it is the intention of Borrower hereby to fully, finally and forever settle and release all matters, disputes and differences, known or unknown, suspected or unsuspected; accordingly, if Borrower should subsequently discover that any fact that it relied upon in entering into this release was untrue, or that any understanding of the facts was incorrect, Borrower shall not be entitled to set aside this release by reason thereof, regardless of any claim of mistake of fact or law or any other circumstances whatsoever. Borrower acknowledges that it is not relying upon and has not relied

upon any representation or statement made by Bank with respect to the facts underlying this release or with regard to any of such party's rights or asserted rights.

5.4 This release may be pleaded as a full and complete defense and/or as a cross-complaint or counterclaim against any action, suit, or other proceeding that may be instituted, prosecuted or attempted in breach of this release. Borrower acknowledges that the release contained herein constitutes a material inducement to Bank to enter into this Amendment, and that Bank would not have done so but for Bank's expectation that such release is valid and enforceable in all events.

5.5 Borrower hereby represents and warrants to Bank, and Bank is relying thereon, as follows:

(a) Except as expressly stated in this Amendment, neither Bank nor any agent, employee or representative of Bank has made any statement or representation to Borrower regarding any fact relied upon by Borrower in entering into this Amendment.

(b) Borrower has made such investigation of the facts pertaining to this Amendment and all of the matters appertaining thereto, as it deems necessary.

(c) The terms of this Amendment are contractual and not a mere recital.

(d) This Amendment has been carefully read by Borrower, the contents hereof are known and understood by Borrower, and this Amendment is signed freely, and without duress, by Borrower

(e) Borrower represents and warrants that it is the sole and lawful owner of all right, title and interest in and to every claim and every other matter which it releases herein, and that it has not heretofore assigned or transferred, or purported to assign or transfer, to any person, firm or entity any claims or other matters herein released. Borrower shall indemnify Bank, defend and hold it harmless from and against all claims based upon or arising in connection with prior assignments or purported assignments or transfers of any claims or matters released herein

6. Ratification of Intellectual Property Security Agreement. **Borrower hereby ratifies, confirms and reaffirms, all and singular, the terms and conditions of a certain Intellectual Property Security Agreement dated as of October 31, 2009 between Borrower and Bank, and acknowledges, confirms and agrees that said Intellectual Property Security Agreement (a) contains an accurate and complete listing of all Intellectual Property Collateral (as defined therein) and (b) shall remain in full force and effect**.

7. Ratification of Perfection Certificate. **Borrower hereby ratifies, confirms and reaffirms, all and singular, the terms and disclosures contained in a certain Perfection Certificate dated as of January 25, 2017, and acknowledges, confirms and agrees that the disclosures and information Borrower provided to Bank in such Perfection Certificate have not changed, as of the date hereof**.

8. 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.

9. 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.

10. Bank Expenses. Borrower shall pay to Bank, when due, all Bank Expenses (including reasonable attorneys' fees and expenses), when due, incurred in connection with or pursuant to this Amendment.

11. 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 an amendment fee with respect to the renewal of the Loan Agreement in an amount equal to $15,000. The above-mentioned fee shall be fully earned and payable concurrently with the execution and delivery of this Amendment and shall be non-refundable and in addition to all interest and other fees payable to Bank under the Loan Documents. Bank is authorized to charge such fees to Borrower's loan account.

[Signature page follows.]

IN WITNESS WHEREOF, the parties hereto have caused this Amendment to be duly executed and delivered as of the date first written above.

BANK	**BORROWER**
Silicon Valley Bank	Netlist, Inc.
By: /s/ ANDREW SKALITZY	By: /s/ GAIL SAKAKI
Name: Andrew Skalitzy	Name: Gail Sasaki
Title: VP	Title: CFO, VP, Secretary

Schedule 1

EXHIBIT B

COMPLIANCE CERTIFICATE

TO: SILICON VALLEY BANK Date:
FROM: NETLIST, INC.

The undersigned authorized officer of NETLIST, INC. ("Borrower") certifies that under the terms and conditions of the Loan and Security Agreement between Borrower and Bank (the "Agreement"), (1) Borrower is in complete compliance for the period ending _____ with all required covenants except as noted below, (2) there are no Events of Default, (3) all representations and warranties in the Agreement are true and correct in all material respects on this date except as noted below; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date, (4) Borrower, and each of its Subsidiaries, has timely filed all required tax returns and reports, and Borrower has timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower except as otherwise permitted pursuant to the terms of Section 5.9 of the Agreement, and (5) no Liens have been levied or claims made against Borrower or any of its Subsidiaries relating to unpaid employee payroll or benefits of which Borrower has not previously provided written notification to Bank. Attached are the required documents supporting the certification. The undersigned certifies that these are prepared in accordance with GAAP consistently applied from one period to the next except as explained in an accompanying letter or footnotes. The undersigned acknowledges that no borrowings may be requested at any time or date of determination that Borrower is not in compliance with any of the terms of the Agreement, and that compliance is determined not just at the date this certificate is delivered. Capitalized terms used but not otherwise defined herein shall have the meanings given them in the Agreement.

Please indicate compliance status by circling Yes/No under "Complies" column.

Reporting Covenant	Required	Complies
Monthly financial statements with Compliance Certificate	Monthly within 30 days	Yes No
Annual financial statement (CPA Audited)	Concurrently with Form 10-K	Yes No
10-Q, 10-K and 8-K	Within 5 days after filing with SEC	Yes No
Annual Projections	Within 30 days of start of FYE	Yes No
A/R & A/P Agings	Monthly within 20 days	Yes No
Borrowing Base Reports	(i) if no Credit Extensions outstanding, monthly (within twenty (20) days after the end of each month) and at the time of each request for an Advance; and (ii) if Credit Extensions outstanding, weekly and at the time of each request for an Advance	Yes No
The following intellectual property was registered after the Effective Date (if no registrations, state "None") _____		

Financial Covenant	Required	Actual	Complies
Maintain on a Monthly Basis:			
Minimum Liquidity Ratio	4.00 : 1.00	____ : 1.00	Yes No

The following financial covenant analysis and information set forth in Schedule 1 attached hereto are true and accurate as of the date of this Certificate.

The following are the exceptions with respect to the certification above: (If no exceptions exist, state "No exceptions to note.")

_____

_____

_____

NETLIST, INC.

By: _____

Name: _____

Title: _____

BANK USE ONLY

Received by: _____

AUTHORIZED SIGNER

Date: _____

Verified: _____

AUTHORIZED SIGNER

Date: _____

Compliance Status: Yes No

Schedule 1 to Compliance Certificate

Financial Covenants of Borrower

In the event of a conflict between this Schedule and the Loan Agreement, the terms of the Loan Agreement shall govern.

Dated: _____

I. Liquidity Ratio (Section 6.9(a))

Required: 4.00 : 1.00
Actual:

A.	Borrower's cash and Cash Equivalents that are unencumbered (except for Bank's security interest) and unrestricted and maintained at Bank	$ _____
B.	Availability Amount	$ _____
C.	Sum of line A plus line B	$ _____
D.	Net Income plus depreciation plus amortization (including amortizing debt discount) plus non-cash expenses related to stock compensation for trailing three months	$ _____
E.	Gross margins associated with deferred NRE revenue for trailing three months	$ _____
F.	EBDA (line D minus line E)	$ _____
G.	Average Trailing 3 Month EBDA (line F divided by 3)	$ _____
H.	Liquidity Ratio (line C divided by line G)	_____ :1.00

Is line H equal to or greater than 4.00 : 1.00 ?

_____ No, not in compliance _____ Yes, in compliance

Exhibit 10.37

PURCHASE AGREEMENT

PURCHASE AGREEMENT (the "Agreement"), dated as of March 5, 2020, by and between **NETLIST, INC.**, a Delaware corporation (the "Company"), and **LINCOLN PARK CAPITAL FUND, LLC**, an Illinois limited liability company (the "Investor").

WHEREAS:

Subject to the terms and conditions set forth in this Agreement, the Company wishes to sell to the Investor, and the Investor wishes to buy from the Company, up to Twenty Million Dollars ($20,000,000) of the Company's common stock, $0.001 par value per share (the "Common Stock"). The shares of Common Stock to be purchased hereunder are referred to herein as the "Purchase Shares."

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 Investor hereby agree as follows:

1. CERTAIN DEFINITIONS.

For purposes of this Agreement, the following terms shall have the following meanings:

(a) "Accelerated Purchase Date" means, with respect to any Accelerated Purchase made pursuant to Section 2(b) hereof, the Business Day immediately following the applicable Purchase Date with respect to the corresponding Regular Purchase referred to in clause (i) of the second sentence of Section 2(b) hereof.

(b) "Accelerated Purchase Minimum Price Threshold" means, with respect to an Accelerated Purchase made pursuant to Section 2(b) hereof, the minimum per share price threshold set forth by the Company (if any) in the applicable Accelerated Purchase Notice.

(c) "Accelerated Purchase Notice" means, with respect to an Accelerated Purchase made pursuant to Section 2(b) hereof, an irrevocable written notice from the Company to the Investor directing the Investor to purchase the number of Purchase Shares specified by the Company therein as the Accelerated Purchase Share Amount to be purchased by the Investor (such specified Accelerated Purchase Share Amount subject to adjustment in accordance with Section 2(b) hereof as necessary to give effect to the Purchase Share amount limitations applicable to such Accelerated Purchase Share Amount as set forth in this Agreement) at the applicable Accelerated Purchase Price on the applicable Accelerated Purchase Date for such Accelerated Purchase.

(d) "Accelerated Purchase Price" means, with respect to an Accelerated Purchase made pursuant to Section 2(b) hereof, the lower of (i) ninety-seven percent (97%) of the VWAP for the period beginning at 9:30:01 a.m., Eastern time, on the applicable Accelerated Purchase Date, or such other time publicly announced by the Principal Market as the official open (or commencement) of trading on the Principal Market on such applicable Accelerated Purchase Date (the "Accelerated Purchase Commencement Time"), and ending at the earliest of (A) 4:00:00 p.m., Eastern time, on such applicable Accelerated Purchase Date, or such other time publicly announced by the Principal Market as the official close of trading on the Principal Market on such applicable Accelerated Purchase Date, (B) such time, from and after the Accelerated Purchase Commencement Time for such Accelerated Purchase, that the total number (or volume) of shares of Common Stock traded on the Principal Market has exceeded the applicable

Accelerated Purchase Share Volume Maximum, and (C) such time, from and after the Accelerated Purchase Commencement Time for such Accelerated Purchase, that the Sale Price has fallen below the applicable Accelerated Purchase Minimum Price Threshold (such earliest of (i)(A), (i)(B) and (i)(C) above, the "Accelerated Purchase Termination Time"), and (ii) the Closing Sale Price of the Common Stock on such applicable Accelerated Purchase Date (to be appropriately adjusted for any applicable reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(e) "Accelerated Purchase Share Amount" means, with respect to an Accelerated Purchase made pursuant to Section 2(b) hereof, the number of Purchase Shares directed by the Company to be purchased by the Investor in an applicable Accelerated Purchase Notice, which number of Purchase Shares shall not exceed the lesser of (i) 300% of the number of Purchase Shares directed by the Company to be purchased by the Investor pursuant to the corresponding Regular Purchase Notice for the corresponding Regular Purchase referred to in clause (i) of the second sentence of Section 2(b) hereof (such corresponding Regular Purchase being subject to the Purchase Share limitations contained in Section 2(a) hereof) and (ii) an amount equal to (A) the Accelerated Purchase Share Percentage multiplied by (B) the total number (or volume) of shares of Common Stock traded on the Principal Market during the period on the applicable Accelerated Purchase Date beginning at the Accelerated Purchase Commencement Time for such Accelerated Purchase and ending at the Accelerated Purchase Termination Time for such Accelerated Purchase.

(f) "Accelerated Purchase Share Percentage" means, with respect to an Accelerated Purchase made pursuant to Section 2(b) hereof, thirty percent (30%).

(g) "Accelerated Purchase Share Volume Maximum" means, with respect to an Accelerated Purchase made pursuant to Section 2(b) hereof, a number of shares of Common Stock equal to (i) the number of Purchase Shares specified by the Company in the applicable Accelerated Purchase Notice as the Accelerated Purchase Share Amount to be purchased by the Investor in such Accelerated Purchase, divided by (ii) the Accelerated Purchase Share Percentage (to be appropriately adjusted for any applicable reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(h) "Additional Accelerated Purchase Date" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, the Business Day (i) that is the Accelerated Purchase Date with respect to the corresponding Accelerated Purchase referred to in clause (i) of the proviso in the second sentence of Section 2(c) hereof and (ii) on which the Investor receives, prior to 1:00 p.m., Eastern time, on such Business Day, a valid Additional Accelerated Purchase Notice for such Additional Accelerated Purchase in accordance with this Agreement.

(i) "Additional Accelerated Purchase Minimum Price Threshold" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, the minimum per share price threshold (if any) set forth by the Company in the applicable Additional Accelerated Purchase Notice.

(j) "Additional Accelerated Purchase Notice" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, an irrevocable written notice from the Company to the Investor directing the Investor to purchase the number of Purchase Shares specified by the Company therein as the Additional Accelerated Purchase Share Amount to be purchased by the Investor (such specified Additional Accelerated Purchase Share Amount subject to adjustment in accordance with Section 2(c) hereof as necessary to give effect to the Purchase Share amount limitations applicable to such Additional Accelerated Purchase Share Amount as set forth in this Agreement) at the applicable Additional Accelerated Purchase Price on the applicable Additional Accelerated Purchase Date for such Additional Accelerated Purchase.

(k) "Additional Accelerated Purchase Price" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, the lower of (i) ninety-seven percent (97%) of the VWAP for the period on the applicable Additional Accelerated Purchase Date, beginning at the latest of (A) the applicable Accelerated Purchase Termination Time with respect to the corresponding Accelerated Purchase referred to in clause (i) of the proviso in the second sentence of Section 2(c) hereof on such Additional Accelerated Purchase Date, (B) the applicable Additional Accelerated Purchase Termination Time with respect to the most recently completed prior Additional Accelerated Purchase on such Additional Accelerated Purchase Date, as applicable, and (C) the time at which all Purchase Shares subject to all prior Accelerated Purchases and Additional Accelerated Purchases (as applicable), including, without limitation, those that have been effected on the same Business Day as the applicable Additional Accelerated Purchase Date with respect to which the applicable Additional Accelerated Purchase relates, have theretofore been received by the Investor as DWAC Shares in accordance with this Agreement (such latest of (i)(A), (i)(B) and (i)(C) above, the "Additional Accelerated Purchase Commencement Time"), and ending at the earliest of (X) 4:00 p.m., Eastern time, on such Additional Accelerated Purchase Date, or such other time publicly announced by the Principal Market as the official close of trading on the Principal Market on such Additional Accelerated Purchase Date, (Y) such time, from and after the Additional Accelerated Purchase Commencement Time for such Additional Accelerated Purchase, that total number (or volume) of shares of Common Stock traded on the Principal Market has exceeded the applicable Additional Accelerated Purchase Share Volume Maximum, and (Z) such time, from and after the Additional Accelerated Purchase Commencement Time for such Additional Accelerated Purchase, that the Sale Price has fallen below the applicable Additional Accelerated Purchase Minimum Price Threshold (such earliest of (i)(X), (i)(Y) and (i)(Z) above, the "Additional Accelerated Purchase Termination Time"), and (ii) the Closing Sale Price of the Common Stock on such Additional Accelerated Purchase Date (to be appropriately adjusted for any applicable reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(l) "Additional Accelerated Purchase Share Amount" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, the number of Purchase Shares directed by the Company to be purchased by the Investor on an Additional Accelerated Purchase Notice, which number of Purchase Shares shall not exceed the lesser of (i) 300% of the number of Purchase Shares directed by the Company to be purchased by the Investor pursuant to the corresponding Regular Purchase Notice for the corresponding Regular Purchase referred to in clause (i) of the proviso in the second sentence of Section 2(c) hereof (such corresponding Regular Purchase being subject to the Purchase Share limitations contained in Section 2(a) hereof) and (ii) an amount equal to (A) the Additional Accelerated Purchase Share Percentage multiplied by (B) the total number (or volume) of shares of Common Stock traded on the Principal Market during the period on the applicable Additional Accelerated Purchase Date beginning at the Additional Accelerated Purchase Commencement Time for such Additional Accelerated Purchase and ending at the Additional Accelerated Purchase Termination Time for such Additional Accelerated Purchase.

(l) "Additional Accelerated Purchase Share Percentage" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, thirty percent (30%).

(m) "Additional Accelerated Purchase Share Volume Maximum" means, with respect to an Additional Accelerated Purchase made pursuant to Section 2(c) hereof, a number of shares of Common Stock equal to (i) the number of Purchase Shares specified by the Company in the applicable Additional Accelerated Purchase Notice as the Additional Accelerated Purchase Share Amount to be purchased by the Investor in such Additional Accelerated Purchase, divided by (ii) the Additional Accelerated Purchase Share Percentage (to be appropriately adjusted for any applicable reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(n) "Alternate Adjusted Regular Purchase Share Limit" means, with respect to a Regular Purchase made pursuant to Section 2(b) hereof, the maximum number of Purchase Shares which, taking into account the applicable per share Purchase Price therefor calculated in accordance with this Agreement, would enable the Company to deliver to the Investor, on the applicable Purchase Date for such Regular Purchase, a Regular Purchase Notice for a Purchase Amount equal to, or as closely approximating without exceeding, Seventy-Five Thousand Dollars ($75,000).

(o) "Available Amount" means, initially, Twenty Million Dollars ($20,000,000) in the aggregate, which amount shall be reduced by the Purchase Amount each time the Investor purchases shares of Common Stock pursuant to Section 2 hereof.

(p) "Bankruptcy Law" means Title 11, U.S. Code, or any similar federal or state law for the relief of debtors.

(q) "Base Prospectus" means the Company's final base prospectus, dated November 28, 2018, a preliminary form of which is included in the Registration Statement, including the documents incorporated by reference therein.

(r) "Business Day" means any day on which the Principal Market is open for trading, including any day on which the Principal Market is open for trading for a period of time less than the customary time.

(s) "Closing Sale Price" means, for any security as of any date, the last closing sale price for such security on the Principal Market as reported by the Principal Market.

(t) "Confidential Information" means any information disclosed by either party to the other party, either directly or indirectly, in writing, orally or by inspection of tangible objects (including, without limitation, documents, prototypes, samples, plant and equipment), which is designated as "Confidential," "Proprietary" or some similar designation. Information communicated orally shall be considered Confidential Information if such information is confirmed in writing as being Confidential Information within ten (10) Business Days after the initial disclosure. Confidential Information may also include information disclosed to a disclosing party by third parties. Confidential Information shall not, however, include any information which (i) was publicly known and made generally available in the public domain prior to the time of disclosure by the disclosing party; (ii) becomes publicly known and made generally available after disclosure by the disclosing party to the receiving party through no action or inaction of the receiving party; (iii) is already in the possession of the receiving party without confidential restriction at the time of disclosure by the disclosing party as shown by the receiving party's files and records immediately prior to the time of disclosure; (iv) is obtained by the receiving party from a third party without a breach of such third party's obligations of confidentiality; (v) is independently developed by the receiving party without use of or reference to the disclosing party's Confidential Information, as shown by documents and other competent evidence in the receiving party's possession; or (vi) is required by law to be disclosed by the receiving party, provided that the receiving party gives the disclosing party prompt written notice of such requirement prior to such disclosure and assistance in obtaining an order protecting the information from public disclosure.

(u) "Custodian" means any receiver, trustee, assignee, liquidator or similar official under any Bankruptcy Law.

(v) "DTC" means The Depository Trust Company, or any successor performing substantially the same function for the Company.

(w) "DWAC Shares" means shares of Common Stock that are (i) issued in electronic form, (ii) freely tradable and transferable and without restriction on resale and (iii) timely credited by the Company to the Investor's or its designee's specified Deposit/Withdrawal at Custodian (DWAC) account with DTC under its Fast Automated Securities Transfer (FAST) Program, or any similar program hereafter adopted by DTC performing substantially the same function.

(x) "Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

(y) "Floor Price" means $0.10, which shall be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction and, effective upon the consummation of any such reorganization, recapitalization, non-cash dividend, stock split or other similar transaction, the Floor Price shall mean the lower of (i) the adjusted price and (ii) $1.00.

(z) "Fully Adjusted Regular Purchase Share Limit" means, with respect to any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction from and after the date of this Agreement, the Regular Purchase Share Limit (as defined in Section 2(a) hereof) in effect on the applicable date of determination, after giving effect to the full proportionate adjustment thereto made pursuant to Section 2(a) hereof for or in respect of such reorganization, recapitalization, non-cash dividend, stock split or other similar transaction.

(aa) "Initial Prospectus Supplement" means the prospectus supplement of the Company dated March 9, 2020 relating to the Securities, including the accompanying Base Prospectus, to be prepared and filed by the Company with the SEC pursuant to Rule 424(b)(5) under the Securities Act and in accordance with Section 5(a) hereof, together with all documents and information incorporated therein by reference.

(bb) "Material Adverse Effect" means any material adverse effect on (i) the enforceability of any Transaction Document, (ii) the results of operations, assets, business or financial condition of the Company and its Subsidiaries, taken as a whole, other than any material adverse effect that resulted primarily from (A) any change in the United States or foreign economies or securities or financial markets in general that does not have a disproportionate effect on the Company and its Subsidiaries, taken as a whole, (B) any change that generally affects the industry in which the Company and its Subsidiaries operate that does not have a disproportionate effect on the Company and its Subsidiaries, taken as a whole, (C) any change arising in connection with earthquakes, hostilities, acts of war, sabotage or terrorism or military actions or any escalation or material worsening of any such hostilities, acts of war, sabotage or terrorism or military actions existing as of the date hereof, (D) any action taken by the Investor, its affiliates or its or their successors and assigns with respect to the transactions contemplated by this Agreement, (E) the effect of any change in applicable laws or accounting rules that does not have a disproportionate effect on the Company and its Subsidiaries, taken as a whole, or (F) any change resulting from compliance with terms of this Agreement or the consummation of the transactions contemplated by this Agreement, or (iii) the Company's ability to perform in any material respect on a timely basis its obligations under any Transaction Document to be performed as of the date of determination.

(cc) "Maturity Date" means the first day of the month immediately following the thirty-six (36) month anniversary of the Commencement Date.

(dd) "Person" means an individual or entity including but not limited to any limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization and a government or any department or agency thereof.

(ee) "Principal Market" means the OTCQX operated by the OTC Markets Group, Inc. (or any nationally recognized successor thereto); provided, however, that in the event the Company's Common Stock is ever listed or traded on The NASDAQ Capital Market, The NASDAQ Global Market, The NASDAQ Global Select Market, the New York Stock Exchange, the NYSE American, the NYSE Arca, the OTC Bulletin Board, or the OTCQB operated by the OTC Markets Group, Inc. (or any nationally recognized successor to any of the foregoing), then the "Principal Market" shall mean such other market or exchange on which the Company's Common Stock is then listed or traded.

(ff) "Prospectus" means the Base Prospectus, as supplemented by any Prospectus Supplement (including the Initial Prospectus Supplement), including the documents and information incorporated by reference therein.

(gg) "Prospectus Supplement" means any prospectus supplement to the Base Prospectus (including the Initial Prospectus Supplement) filed with the SEC pursuant to Rule 424(b) under the Securities Act in connection with the transactions contemplated by this Agreement, including the documents and information incorporated by reference therein.

(hh) "Registration Statement" means the effective registration statement on Form S-3 (Commission File No. 333-228348) filed by the Company with the SEC pursuant to the Securities Act for the registration of shares of its Common Stock, including the Securities, and certain other securities of the Company, as such Registration Statement has been or may be amended and supplemented from time to time, including all documents filed as part thereof or incorporated by reference therein, and including all information deemed to be a part thereof at the time of effectiveness pursuant to Rule 430B of the Securities Act, including any comparable successor registration statement filed by the Company with the SEC pursuant to the Securities Act for the registration of shares of its Common Stock, including the Securities.

(ii) "Purchase Amount" means, with respect to a Regular Purchase, an Accelerated Purchase or an Additional Accelerated Purchase made hereunder, as applicable, the portion of the Available Amount to be purchased by the Investor pursuant to Section 2 hereof.

(jj) "Purchase Date" means, with respect to a Regular Purchase made pursuant to Section 2(a) hereof, the Business Day on which the Investor receives, after 4:00 p.m., Eastern time, but prior to 5:00 p.m., Eastern time, on such Business Day, a valid Regular Purchase Notice for such Regular Purchase in accordance with this Agreement.

(kk) "Purchase Price" means, with respect to a Regular Purchase made pursuant to Section 2(a) hereof, the lower of: (i) the lowest Sale Price on the Purchase Date for such Regular Purchase and (ii) the arithmetic average of the three (3) lowest Closing Sale Prices for the Common Stock during the twelve (12) consecutive Business Days ending on the Business Day immediately preceding such Purchase Date for such Regular Purchase (in each case, to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction that occurs on or after the date of this Agreement).

(ll) "Regular Purchase Notice" means, with respect to a Regular Purchase pursuant to Section 2(a) hereof, an irrevocable written notice from the Company to the Investor directing the Investor to buy a specified number of Purchase Shares (subject to the Purchase Share limitations contained in Section 2(a) hereof) at the applicable Purchase Price for such Regular Purchase in accordance with this Agreement.

(mm) "Sale Price" means any trade price for the shares of Common Stock on the Principal Market as reported by the Principal Market.

(oo) "SEC" means the U.S. Securities and Exchange Commission.

(pp) "Securities" means, collectively, the Purchase Shares and the Commitment Shares.

(qq) "Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

(rr) "Subsidiary" means any Person the Company wholly-owns or controls, or in which the Company, directly or indirectly, owns a majority of the voting stock or similar voting interest, in each case that would be disclosable pursuant to Item 601(b)(21) of Regulation S-K promulgated under the Securities Act.

(ss) "Transaction Documents" means, collectively, this Agreement and the schedules and exhibits hereto and each of the other agreements, documents, certificates and instruments entered into or furnished by the parties hereto in connection with the transactions contemplated hereby and thereby.

(tt) "Transfer Agent" means Computershare Trust Company, N.A., or such other Person who is then serving as the transfer agent for the Company in respect of the Common Stock.

(uu) "VWAP" means in respect of an Accelerated Purchase Date and an Additional Accelerated Purchase Date, as applicable, the volume weighted average price of the Common Stock on the Principal Market, as reported on the Principal Market.

2. PURCHASE OF COMMON STOCK.

Subject to the terms and conditions set forth in this Agreement, the Company has the right to sell to the Investor, and the Investor has the obligation to purchase from the Company, Purchase Shares as follows:

(a) Commencement of Regular Sales of Common Stock. Upon the satisfaction of all of the conditions set forth in Sections 7 and 8 hereof (the "Commencement" and the date of satisfaction of such conditions the "Commencement Date"), and thereafter, the Company shall have the right, but not the obligation, to direct the Investor, by its delivery to the Investor of a Regular Purchase Notice from time to time in accordance with this Agreement, to purchase up to Four Hundred Thousand (400,000) Purchase Shares, subject to adjustment as set forth below in this Section 2(a) (such maximum number of Purchase Shares, as may be adjusted from time to time, the "Regular Purchase Share Limit"), at the Purchase Price on the Purchase Date (each such purchase a "Regular Purchase"); provided, however, that (i) the Regular Purchase Share Limit shall be increased to Four Hundred Fifty Thousand (450,000) Purchase Shares, if the Closing Sale Price of the Common Stock on the applicable Purchase Date is not below $0.40, (ii) the Regular Purchase Share Limit shall be increased to Five Hundred Fifty Thousand (550,000) Purchase Shares, if the Closing Sale Price of the Common Stock on the applicable Purchase Date is not below $0.65, and (iii) the Regular Purchase Share Limit shall be increased to Six Hundred Fifty Thousand (650,000) Purchase Shares, if the Closing Sale Price of the Common Stock on the applicable Purchase Date is not below $0.90 (all of which share and dollar amounts shall be appropriately proportionately adjusted for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction; *provided* that if, after giving effect to the full proportionate adjustment to the Regular Purchase Share Limit therefor, the Fully Adjusted Regular Purchase Share Limit then in effect would preclude the Company from delivering to the Investor, on a Purchase Date for a Regular Purchase hereunder, a Regular Purchase Notice for a Purchase Amount equal to or greater than Seventy-Five Thousand Dollars ($75,000) (which shall be determined by multiplying (X) the Fully Adjusted Regular Purchase Share Limit then in effect on such Purchase Date, by (Y) the applicable Purchase Price per Purchase Share for such Regular Purchase calculated in accordance with this Agreement), the Regular Purchase Share Limit shall not be fully adjusted

to equal the applicable Fully Adjusted Regular Purchase Share Limit, but rather shall be adjusted to equal the applicable Alternate Adjusted Regular Purchase Share Limit); and provided, further, however, that the Investor's maximum committed obligation under any single Regular Purchase, other than any Regular Purchase with respect to which an Alternate Adjusted Regular Purchase Share Limit shall apply, shall not exceed One Million Dollars ($1,000,000). If the Company delivers any Regular Purchase Notice for a Purchase Amount in excess of the limitations contained in the immediately preceding sentence, such Regular Purchase Notice shall be void *ab initio* to the extent of the amount by which the number of Purchase Shares set forth in such Regular Purchase Notice exceeds the number of Purchase Shares which the Company is permitted to include in such Purchase Notice in accordance herewith, and the Investor shall have no obligation to purchase such excess Purchase Shares in respect of such Regular Purchase Notice; provided, however, that the Investor shall remain obligated to purchase the number of Purchase Shares which the Company is permitted to include in such Regular Purchase Notice; and provided, further, however, that the parties may mutually agree to increase the Regular Purchase Share Limit applicable to any Regular Purchase and/or the Investor's maximum committed obligation under any Regular Purchase on the applicable Purchase Date therefor, and all of the Purchase Shares subject to such increased Regular Purchase shall be purchased by the Investor at the applicable Purchase Price therefor calculated in accordance with this Agreement. The Company may deliver a Regular Purchase Notice to the Investor as often as every Business Day, so long as (i) the Closing Sale Price of the Common Stock on such Business Day is not less than the Regular Purchase Floor Price and (ii) all Purchase Shares subject to all prior Regular Purchases have theretofore been received by the Investor as DWAC Shares in accordance with this Agreement.

(b) Accelerated Purchases. Subject to the terms and conditions of this Agreement, beginning one (1) Business Day following the Commencement Date and thereafter, in addition to purchases of Purchase Shares as described in Section 2(a) above, the Company shall also have the right, but not the obligation, to direct the Investor, by its delivery to the Investor of an Accelerated Purchase Notice from time to time in accordance with this Agreement, to purchase the applicable Accelerated Purchase Share Amount at the Accelerated Purchase Price on the Accelerated Purchase Date therefor in accordance with this Agreement (each such purchase, an "Accelerated Purchase"). The Company may deliver an Accelerated Purchase Notice to the Investor only on a Purchase Date on which (i) the Company also properly submitted a Regular Purchase Notice providing for a Regular Purchase of a number of Purchase Shares not less than the Regular Purchase Share Limit then in effect on such Purchase Date in accordance with this Agreement (including, without limitation, giving effect to any automatic increase to the Regular Purchase Share Limit as a result of the Closing Sale Price of the Common Stock exceeding certain thresholds set forth in Section 2(a) above on such Purchase Date and any other adjustments to the Regular Purchase Share Limit, in each case pursuant to Section 2(a) above) and (ii) the Closing Sale Price of the Common Stock is not less than the Floor Price. If the Company delivers any Accelerated Purchase Notice directing the Investor to purchase an amount of Purchase Shares that exceeds the Accelerated Purchase Share Amount that the Company is then permitted to include in such Accelerated Purchase Notice in accordance with the terms of this Agreement, such Accelerated Purchase Notice shall be void *ab initio* to the extent of the amount by which the number of Purchase Shares set forth in such Accelerated Purchase Notice exceeds the Accelerated Purchase Share Amount that the Company is then permitted to include in such Accelerated Purchase Notice in accordance with the terms of this Agreement (which shall be confirmed in an Accelerated Purchase Confirmation (defined below)), and the Investor shall have no obligation to purchase such excess Purchase Shares in respect of such Accelerated Purchase Notice; provided, however, that the Investor shall remain obligated to purchase the Accelerated Purchase Share Amount which the Company is permitted to include in such Accelerated Purchase Notice; and provided, further, however, that the parties may mutually agree to increase the Accelerated Purchase Share Amount applicable to any Accelerated Purchase, and all of the Purchase Shares subject to such increased Accelerated Purchase shall be purchased by the Investor at the Accelerated Purchase Price on the Accelerated Purchase Date for such increased Accelerated Purchase in accordance with this Agreement. Within one (1) Business

Day after completion of each Accelerated Purchase Date for an Accelerated Purchase, the Investor will provide to the Company a written confirmation of such Accelerated Purchase setting forth the applicable Accelerated Purchase Share Amount and Accelerated Purchase Price for such Accelerated Purchase (each, an "Accelerated Purchase Confirmation").

(c) Additional Accelerated Purchases. Subject to the terms and conditions of this Agreement, beginning one (1) Business Day following the Commencement Date and thereafter, in addition to purchases of Purchase Shares as described in Section 2(a) and Section 2(b) above, the Company shall also have the right, but not the obligation, to direct the Investor, by its timely delivery to the Investor of an Additional Accelerated Purchase Notice on an Additional Accelerated Purchase Date in accordance with this Agreement, to purchase the applicable Additional Accelerated Purchase Share Amount at the applicable Additional Accelerated Purchase Price therefor in accordance with this Agreement (each such purchase, an "Additional Accelerated Purchase"). The Company may deliver multiple Additional Accelerated Purchase Notices to the Investor on an Additional Accelerated Purchase Date; provided, however, that the Company may deliver an Additional Accelerated Purchase Notice to the Investor only (i) on a Business Day that is also the Accelerated Purchase Date for an Accelerated Purchase with respect to which the Company properly submitted to the Investor an Accelerated Purchase Notice in accordance with this Agreement on the applicable Purchase Date for a Regular Purchase of a number of Purchase Shares not less than the Regular Purchase Share Limit then in effect in accordance with this Agreement (including, without limitation, giving effect to any automatic increase to the Regular Purchase Share Limit as a result of the Closing Sale Price of the Common Stock exceeding certain thresholds set forth in Section 2(a) above on such Purchase Date and any other adjustments to the Regular Purchase Share Limit, in each case pursuant to Section 2(a) above), (ii) if the Closing Sale Price of the Common Stock on the Business Day immediately preceding the Business Day on which such Additional Accelerated Purchase Notice is delivered is not less than the Floor Price, and (iii) if all Purchase Shares subject to all prior Regular Purchases, Accelerated Purchases and Additional Accelerated Purchases, including, without limitation, those that have been effected on the same Business Day as the applicable Additional Accelerated Purchase Date with respect to which the applicable Additional Accelerated Purchase relates, have theretofore been received by the Investor as DWAC Shares in accordance with this Agreement. If the Company delivers any Additional Accelerated Purchase Notice directing the Investor to purchase an amount of Purchase Shares that exceeds the Additional Accelerated Purchase Share Amount that the Company is then permitted to include in such Additional Accelerated Purchase Notice in accordance with the terms of this Agreement, such Additional Accelerated Purchase Notice shall be void *ab initio* to the extent of the amount by which the number of Purchase Shares set forth in such Additional Accelerated Purchase Notice exceeds the Additional Accelerated Purchase Share Amount that the Company is then permitted to include in such Additional Accelerated Purchase Notice in accordance with the terms of this Agreement (which shall be confirmed in an Additional Accelerated Purchase Confirmation (defined below)), and the Investor shall have no obligation to purchase such excess Purchase Shares in respect of such Additional Accelerated Purchase Notice; provided, however, that the Investor shall remain obligated to purchase the Additional Accelerated Purchase Share Amount which the Company is permitted to include in such Additional Accelerated Purchase Notice; and provided, further, however, that the parties may mutually agree to increase the Additional Accelerated Purchase Share Amount applicable to any Additional Accelerated Purchase, and all of the Purchase Shares subject to such increased Additional Accelerated Purchase shall be purchased by the Investor at the Additional Accelerated Purchase Price for such increased Additional Accelerated Purchase in accordance with this Agreement. Within one (1) Business Day after completion of each Additional Accelerated Purchase Date, the Investor will provide to the Company a written confirmation of each Additional Accelerated Purchase on such Additional Accelerated Purchase Date setting forth the applicable Additional Accelerated Purchase Share Amount and Additional Accelerated Purchase Price for each such Additional Accelerated Purchase on such Additional Accelerated Purchase Date (each, an "Additional Accelerated Purchase Confirmation").

(d) Payment for Purchase Shares. For each Regular Purchase, the Investor shall pay to the Company an amount equal to the Purchase Amount with respect to such Regular Purchase as full payment for such Purchase Shares via wire transfer of immediately available funds on the same Business Day that the Investor receives such Purchase Shares, if such Purchase Shares are received by the Investor before 1:00 p.m., Eastern time, or, if such Purchase Shares are received by the Investor after 1:00 p.m., Eastern time, the next Business Day. For each Accelerated Purchase and each Additional Accelerated Purchase, the Investor shall pay to the Company an amount equal to the Purchase Amount with respect to such Accelerated Purchase and Additional Accelerated Purchase, respectively, as full payment for such Purchase Shares via wire transfer of immediately available funds on the second Business Day following the date that the Investor receives such Purchase Shares. If the Company or the Transfer Agent shall fail for any reason or for no reason to electronically transfer any Purchase Shares as DWAC Shares with respect to any Regular Purchase, Accelerated Purchase or Additional Accelerated Purchase (as applicable) within two (2) Business Days following the receipt by the Company of the Purchase Price, Accelerated Purchase Price or Additional Accelerated Purchase Price, respectively, therefor in compliance with this Section 2(d), and if on or after such Business Day the Investor purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Investor of such Purchase Shares that the Investor anticipated receiving from the Company in respect of such Regular Purchase, Accelerated Purchase or Additional Accelerated Purchase (as applicable), then the Company shall, within two (2) Business Days after the Investor's request, either (i) pay cash to the Investor in an amount equal to the Investor's total purchase price (including customary brokerage commissions, if any) for the shares of Common Stock so purchased (the "Cover Price"), at which point the Company's obligation to deliver such Purchase Shares as DWAC Shares shall terminate, or (ii) promptly honor its obligation to deliver to the Investor such Purchase Shares as DWAC Shares and pay cash to the Investor in an amount equal to the excess (if any) of the Cover Price over the total Purchase Amount paid by the Investor pursuant to this Agreement for all of the Purchase Shares to be purchased by the Investor in connection with such purchases. The Company shall not issue any fraction of a share of Common Stock upon any Regular Purchase, Accelerated Purchase or Additional Accelerated Purchase. If the issuance would result in the issuance of a fraction of a share of Common Stock, the Company shall round such fraction of a share of Common Stock up or down to the nearest whole share. All payments made under this Agreement shall be made in lawful money of the United States of America or wire transfer of immediately available funds to such account as the Company may from time to time designate by written notice in accordance with the provisions of this Agreement. Whenever any amount expressed to be due by the terms of this Agreement is due on any day that is not a Business Day, the same shall instead be due on the next succeeding day that is a Business Day.

(e) Beneficial Ownership Limitation. Notwithstanding anything to the contrary contained in this Agreement, the Company shall not issue or sell, and the Investor shall not purchase or acquire, any shares of Common Stock under this Agreement which, when aggregated with all other shares of Common Stock then beneficially owned by the Investor and its affiliates (as calculated pursuant to Section 13(d) of the Exchange Act and Rule 13d-3 promulgated thereunder), would result in the beneficial ownership by the Investor of more than 9.99% of the then issued and outstanding shares of Common Stock (the "Beneficial Ownership Limitation"). Upon the written or oral request of the Investor, the Company shall promptly (but not later than 24 hours) confirm orally or in writing to the Investor the number of shares of Common Stock then outstanding. The Investor and the Company shall each cooperate in good faith in the determinations required hereby and the application hereof. The Investor's written certification to the Company of the applicability of the Beneficial Ownership Limitation, and the resulting effect thereof hereunder at any time, shall be conclusive with respect to the applicability thereof and such result absent manifest error.

3. INVESTOR'S REPRESENTATIONS AND WARRANTIES.

The Investor represents and warrants to the Company that as of the date hereof and as of the Commencement Date:

(a) Organization, Authority. Investor is an entity duly organized, validly existing and in good standing under the laws of the jurisdiction of its organization, with the requisite power and authority to enter into and to consummate the transactions contemplated by this Agreement and otherwise to carry out its obligations hereunder and thereunder

(b) Accredited Investor Status. The Investor is an “accredited investor” as that term is defined in Rule 501(a)(3) of Regulation D promulgated under the Securities Act.

(c) Information. The Investor understands that its investment in the Securities involves a high degree of risk. The Investor (i) is able to bear the economic risk of an investment in the Securities including a total loss thereof, (ii) has such knowledge and experience in financial and business matters that it is capable of evaluating the merits and risks of the proposed investment in the Securities and (iii) has had an opportunity to ask questions of and receive answers from the officers of the Company concerning the financial condition and business of the Company and others matters related to an investment in the Securities. Neither such inquiries nor any other due diligence investigations conducted by the Investor or its representatives shall modify, amend or affect the Investor's right to rely on the Company's representations and warranties contained in Section 4 below. The Investor has sought such accounting, legal and tax advice as it has considered necessary to make an informed investment decision with respect to its acquisition of the Securities.

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

(e) Validity; Enforcement. This Agreement has been duly and validly authorized, executed and delivered on behalf of the Investor and is a valid and binding agreement of the Investor enforceable against the Investor in accordance with its terms, subject as to enforceability to general principles of equity and to applicable bankruptcy, insolvency, reorganization, moratorium, liquidation and other similar laws relating to, or affecting generally, the enforcement of applicable creditors' rights and remedies.

(f) Residency. The Investor is a resident of the State of Illinois.

(g) No Short Selling. The Investor represents and warrants to the Company that at no time prior to the date of this Agreement has any of the Investor, its agents, representatives or affiliates engaged in or effected, in any manner whatsoever, directly or indirectly, any (i) "short sale" (as such term is defined in Rule 200 of Regulation SHO of the Exchange Act) of the Common Stock or (ii) hedging transaction, which establishes a net short position with respect to the Common Stock.

4. REPRESENTATIONS AND WARRANTIES OF THE COMPANY.

The Company represents and warrants to the Investor that, except as set forth in the disclosure schedules attached hereto, which exceptions shall be deemed to be part of the representations and warranties made hereunder, as of the date hereof and as of the Commencement Date:

(a) Organization and Qualification. The Company and each of its Subsidiaries is an entity duly incorporated or otherwise organized, validly existing and in good standing under the laws of the jurisdiction of its incorporation or organization, 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 of its Subsidiaries is in violation or default of any of the provisions of its respective certificate or articles of incorporation, bylaws or other organizational or charter documents. Each of the Company and its Subsidiaries is duly qualified to conduct business and is in good standing 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, could not have or reasonably be expected to result in a Material Adverse Effect and no proceeding has been instituted in any such jurisdiction revoking, limiting or curtailing or seeking to revoke, limit or curtail such power and authority or qualification. The Company has no Subsidiaries except as set forth on Exhibit 21.1 to the Company's Annual Report on Form 10-K for the fiscal year ended December 29, 2018.

(b) Authorization; Enforcement; Validity. (i) The Company has the requisite corporate power and authority to enter into and perform its obligations under this Agreement and each of the other Transaction Documents, and to issue the Securities in accordance with the terms hereof and thereof, (ii) the execution and delivery of the Transaction Documents by the Company and the consummation by it of the transactions contemplated hereby and thereby, including without limitation, the issuance of the Commitment Shares (as defined below in Section 5(e)) and the reservation for issuance and the issuance of the Purchase Shares issuable under this Agreement, have been duly authorized by the Company's Board of Directors and no further consent or authorization is required by the Company, its Board of Directors or its stockholders, (iii) this Agreement has been, and each other Transaction Document shall be on the Commencement Date, duly executed and delivered by the Company and (iv) this Agreement constitutes, and each other Transaction Document upon its execution on behalf of the Company, shall constitute, the valid and binding obligations of the Company enforceable against the Company in accordance with their terms, except as such enforceability may be limited by general principles of equity or applicable bankruptcy, insolvency, reorganization, moratorium, liquidation or similar laws relating to, or affecting generally, the enforcement of creditors' rights and remedies. The Board of Directors of the Company has approved the resolutions (the "Signing Resolutions") substantially in the form as set forth as Exhibit C attached hereto to authorize this Agreement and the transactions contemplated hereby. The Signing Resolutions are valid, in full force and effect and have not been modified or supplemented in any respect. The Company has delivered to the Investor a true and correct copy of minutes of a meeting of the Board of Directors of the Company at which the Signing Resolutions were duly adopted by the Board of Directors or a unanimous written consent adopting the Signing Resolutions executed by all of the members of the Board of Directors of the Company. Except as set forth in this Agreement, no other approvals or consents of the Company's Board of Directors, any authorized committee thereof, and/or stockholders (except as provided in this Agreement) is necessary under applicable laws, the Company's certificate of incorporation, as amended and as in effect on the date hereof (the "Certificate of Incorporation"), and the Company's bylaws, as amended and as in effect on the date hereof (the "Bylaws"), to authorize the Company's execution and delivery of this Agreement and each of the other Transaction Documents to which the Company is a party, and the transactions contemplated hereby and thereby, including, but not limited to, the issuance of the Commitment Shares and the Purchase Shares to the Investor as contemplated by this Agreement.

(c) Capitalization. As of the date hereof, the authorized capital stock of the Company is set forth in the Company's Quarterly Report on Form 10-Q for the quarter ended September 28, 2019. Except as disclosed in the SEC Documents (as defined below) or on Schedule 4(c), (i) no shares of the Company's capital stock are subject to preemptive rights or any other similar rights or any liens or encumbrances suffered or permitted by the Company, (ii) there are no outstanding debt securities, (iii) there are no outstanding options, warrants, scrip, rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities or rights convertible into, any shares of capital stock of the Company

or any of its Subsidiaries, or contracts, commitments, understandings or arrangements by which the Company or any of its Subsidiaries is or may become bound to issue additional shares of capital stock of the Company or any of its Subsidiaries or options, warrants, scrip, rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities or rights convertible into, any shares of capital stock of the Company or any of its Subsidiaries, (iv) there are no agreements or arrangements under which the Company or any of its Subsidiaries is obligated to register the sale of any of their securities under the Securities Act, (v) there are no outstanding securities or instruments of the Company or any of its Subsidiaries which contain any redemption or similar provisions, and there are no contracts, commitments, understandings or arrangements by which the Company or any of its Subsidiaries is or may become bound to redeem a security of the Company or any of its Subsidiaries, (vi) there are no securities or instruments containing anti-dilution or similar provisions that will be triggered by the issuance of the Securities as described in this Agreement and (vii) the Company does not have any stock appreciation rights or "phantom stock" plans or agreements or any similar plan or agreement. The Company has furnished to the Investor true and correct copies of (A) the Certificate of Incorporation, (B) the Bylaws, and (C) summaries of the material terms of all securities convertible into or exercisable for Common Stock, if any, and copies of any documents containing the material rights of the holders thereof in respect thereto, which in the case of this clause (C), are not disclosed in any SEC Document or filed as an exhibit thereto.

(d) Issuance of Securities. Upon issuance and payment therefor in accordance with the terms and conditions of this Agreement, the Purchase Shares shall be validly issued, fully paid and nonassessable and free from all taxes, liens, charges, restrictions, rights of first refusal and preemptive rights with respect to the issue thereof, with the holders being entitled to all rights accorded to a holder of Common Stock. Upon issuance in accordance with the terms and conditions of this Agreement, the Commitment Shares shall be validly issued, fully paid and nonassessable and free from all taxes, liens, charges, restrictions, rights of first refusal and preemptive rights with respect to the issue thereof, with the holders being entitled to all rights accorded to a holder of Common Stock. 37,553,517 shares of Common Stock have been duly authorized and reserved for issuance upon purchase under this Agreement as Purchase Shares. 917,431 shares of Common Stock (subject to equitable adjustment for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction) have been duly authorized and reserved for issuance as Additional Commitment Shares in accordance with this Agreement.

(e) No Conflicts. The execution, delivery and performance of the Transaction Documents by the Company and the consummation by the Company of the transactions contemplated hereby and thereby (including, without limitation, the reservation for issuance and issuance of the Purchase Shares and the Commitment Shares) will not (i) result in a violation of the Certificate of Incorporation, any Certificate of Designations, Preferences and Rights of any outstanding series of preferred stock of the Company or the Bylaws 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 agreement, indenture or instrument to which the Company or any of its Subsidiaries is a party, or result in a violation of any law, rule, regulation, order, judgment or decree (including federal and state securities laws and regulations and the rules and regulations of the Principal Market applicable to the Company or any of its Subsidiaries) or by which any property or asset of the Company or any of its Subsidiaries is bound or affected, except in the case of conflicts, defaults, terminations, amendments, accelerations, cancellations and violations under clause (ii), which could not reasonably be expected to result in a Material Adverse Effect. Neither the Company nor its Subsidiaries is in violation of any term of or in default under its Certificate of Incorporation, any Certificate of Designation, Preferences and Rights of any outstanding series of preferred stock of the Company or Bylaws or their organizational charter or bylaws, respectively. Neither the Company nor any of its Subsidiaries is in violation of any term of or is in default under any material contract, agreement, mortgage, indebtedness, indenture, instrument, judgment, decree or order or any statute, rule or regulation applicable to the Company or its Subsidiaries, except for possible conflicts, defaults, terminations or amendments that could not reasonably be expected to have a

Material Adverse Effect. The business of the Company and its Subsidiaries is not being conducted, and shall not be conducted, in violation of any law, ordinance or regulation of any governmental entity, except for possible violations, the sanctions for which either individually or in the aggregate could not reasonably be expected to have a Material Adverse Effect. Except as specifically contemplated by this Agreement and as required under the Securities Act or applicable state securities laws and the rules and regulations of the Principal Market, the Company is not required to obtain any consent, authorization or order of, or make any filing or registration with, any court or governmental agency or any regulatory or self-regulatory agency in order for it to execute, deliver or perform any of its obligations under or contemplated by the Transaction Documents in accordance with the terms hereof or thereof. Except as set forth elsewhere in this Agreement, all consents, authorizations, orders, filings and registrations which the Company is required to obtain pursuant to the preceding sentence shall be obtained or effected on or prior to the Commencement Date.

(f) SEC Documents; Financial Statements. The Company is, and has been at all times since March 1, 2018, required to file reports, schedules, forms, statements and other documents with the SEC pursuant to Section 13 or 15(d) of the Exchange Act. The Company has filed all reports, schedules, forms, statements and other documents required to be filed by the Company with the SEC under the Exchange Act, including pursuant to Section 13(a) or 15(d) thereof, and under the Securities Act, in each case during the 12-month period immediately preceding the date of this Agreement (the foregoing materials, including the exhibits thereto and documents incorporated by reference therein, being collectively referred to herein as the "SEC Documents"), on a timely basis or has received a valid extension of such time of filing and has filed any such SEC Documents prior to the expiration of any such extension. As of their respective dates, the SEC Documents complied in all material respects with the requirements of the Securities Act and the Exchange Act, as applicable. None of the SEC Documents, when filed, 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. The financial statements of the Company included in the SEC Documents 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 or the notes thereto and except that unaudited financial statements may not contain all footnotes required by GAAP, and fairly present in all material respects the 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. Except as set forth in the SEC Documents, the Company has received no notices or correspondence from the SEC for the one year preceding the date hereof. The SEC has not commenced any enforcement proceedings against the Company or any of its Subsidiaries.

(g) Absence of Certain Changes. Except as disclosed in the SEC Documents, since December 29, 2018, there has been no material adverse change in the business, properties, operations, financial condition or results of operations of the Company or its Subsidiaries. The Company has not taken any steps, and does not currently expect to take any steps, to seek protection pursuant to any Bankruptcy Law nor does the Company or any of its Subsidiaries have any knowledge or reason to believe that its creditors intend to initiate involuntary bankruptcy or insolvency proceedings. The Company is financially solvent and is generally able to pay its debts as they become due.

(h) Absence of Litigation. There is no action, suit, proceeding, inquiry or investigation before or by any court, public board, government agency, self-regulatory organization or body pending or, to the knowledge of the Company or any of its Subsidiaries, threatened against or affecting the Company, the Common Stock or any of the Company's or its Subsidiaries' officers or directors in their capacities as such, which could reasonably be expected to have a Material Adverse Effect.

(i) Acknowledgment Regarding Investor's Status. The Company acknowledges and agrees that the Investor is acting solely in the capacity of arm's length purchaser with respect to the Transaction Documents and the transactions contemplated hereby and thereby. The Company further acknowledges that the Investor is not acting as a financial advisor or fiduciary of the Company (or in any similar capacity) with respect to the Transaction Documents and the transactions contemplated hereby and thereby and any advice given by the Investor or any of its representatives or agents in connection with the Transaction Documents and the transactions contemplated hereby and thereby is merely incidental to the Investor's purchase of the Securities. The Company further represents to the Investor that the Company's decision to enter into the Transaction Documents has been based solely on the independent evaluation by the Company and its representatives and advisors.

(j) No Integrated Offering. Neither the Company, nor any of its affiliates, nor any Person acting on its or their behalf has, directly or indirectly, made any offers or sales of any security or solicited any offers to buy any security, under circumstances that would cause this offering of the Securities to be integrated with prior offerings by the Company in a manner that would require stockholder approval pursuant to the rules of the Principal Market on which any of the securities of the Company are listed or designated. The issuance and sale of the Securities hereunder does not contravene the rules and regulations of the Principal Market.

(k) Intellectual Property Rights. The Company and its Subsidiaries own or possess adequate rights or licenses to use all material trademarks, trade names, service marks, service mark registrations, service names, patents, patent rights, copyrights, inventions, licenses, approvals, governmental authorizations, trade secrets and rights necessary to conduct their respective businesses as now conducted. None of the Company's material trademarks, trade names, service marks, service mark registrations, service names, patents, patent rights, copyrights, inventions, licenses, approvals, government authorizations, trade secrets or other intellectual property rights have expired or terminated, or, by the terms and conditions thereof, could expire or terminate within two years from the date of this Agreement. The Company and its Subsidiaries do not have any knowledge of any infringement by the Company or its Subsidiaries of any material trademark, trade name rights, patents, patent rights, copyrights, inventions, licenses, service names, service marks, service mark registrations, trade secret or other similar rights of others, or of any such development of similar or identical trade secrets or technical information by others, and there is no claim, action or proceeding being made or brought against, or to the Company's knowledge, being threatened against, the Company or its Subsidiaries regarding trademark, trade name, patents, patent rights, invention, copyright, license, service names, service marks, service mark registrations, trade secret or other infringement, which could reasonably be expected to have a Material Adverse Effect.

(l) Environmental Laws. The Company and its Subsidiaries (i) are in compliance with any and all applicable foreign, federal, state and local laws and regulations relating to the protection of human health and safety, the environment or hazardous or toxic substances or wastes, pollutants or contaminants ("Environmental Laws"), (ii) have received all permits, licenses or other approvals required of them under applicable Environmental Laws to conduct their respective businesses and (iii) are in compliance with all terms and conditions of any such permit, license or approval, except where, in each of the three foregoing clauses, the failure to so comply could not reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect.

(m) Title. Except as set forth in the SEC Documents, the Company and its Subsidiaries have good and marketable title in fee simple to all real property owned by them and good and marketable title in all personal property owned by them that is material to the business of the Company and its Subsidiaries, in each case free and clear of all liens, encumbrances and defects ("Liens") and, except for Liens as do not materially affect the value of such property and do not materially interfere with the use made and proposed

to be made of such property by the Company and its Subsidiaries and Liens for the payment of federal, state or other taxes, the payment of which is neither delinquent nor subject to penalties. Any real property and facilities held under lease by the Company and its Subsidiaries are held by them under valid, subsisting and enforceable leases with which the Company and its Subsidiaries are in compliance with such exceptions as are not material and do not interfere with the use made and proposed to be made of such property and buildings by the Company and its Subsidiaries.

(n) Insurance. The Company and each of its Subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as management of the Company believes to be prudent and customary in the businesses in which the Company and its Subsidiaries are engaged. Neither the Company nor any such Subsidiary has been refused any insurance coverage sought or applied for and neither the Company nor any such Subsidiary has any reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business at a cost that would not materially and adversely affect the condition, financial or otherwise, or the earnings, business or operations of the Company and its Subsidiaries, taken as a whole.

(o) Regulatory Permits. The Company and its Subsidiaries possess all material certificates, authorizations and permits issued by the appropriate federal, state or foreign regulatory authorities necessary to conduct their respective businesses, and neither the Company nor any such Subsidiary has received any notice of proceedings relating to the revocation or modification of any such certificate, authorization or permit.

(p) Tax Status. Except as set forth on Schedule 4(p) the Company and each of its Subsidiaries has made or filed all federal and state income and all other material tax returns, reports and declarations required by any jurisdiction to which it is subject (unless and only to the extent that the Company and each of its Subsidiaries has set aside on its books provisions reasonably adequate for the payment of all unpaid and unreported taxes) and has paid all taxes and other governmental assessments and charges that are material in amount, shown or determined to be due on such returns, reports and declarations, except those being contested in good faith and has set aside on its books provision reasonably adequate for the payment of all taxes for periods subsequent to the periods to which such returns, reports or declarations apply. There are no unpaid taxes in any material amount claimed to be due by the taxing authority of any jurisdiction, and the officers of the Company know of no basis for any such claim.

(q) Transactions With Affiliates. Except as set forth in the SEC Documents, none of the officers or directors of the Company and, to the knowledge of the Company, none of the employees of the Company is presently a party to any transaction with the Company or any Subsidiary (other than for services as employees, officers and directors), including any contract, agreement or other arrangement providing for the furnishing of services to or by, providing for rental of real or personal property to or from, or otherwise requiring payments to or from any officer, director or such employee or, to the knowledge of the Company, any entity in which any officer, director, or any such employee has a substantial interest or is an officer, director, trustee or partner, in each case in excess of $120,000 other than for (i) payment of salary or consulting fees for services rendered, (ii) reimbursement for expenses incurred on behalf of the Company and (iii) other employee benefits, including stock option agreements under any stock option plan of the Company.

(r) Application of Takeover Protections. The Company and its board of directors have taken or will take prior to the Commencement Date all necessary action, if any, in order to render inapplicable any control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Certificate of Incorporation or the laws of the state of its incorporation which is or could become applicable to the Investor as a result of the transactions

contemplated by this Agreement, including, without limitation, the Company's issuance of the Securities and the Investor's ownership of the Securities.

(s) Disclosure. Except with respect to the material terms and conditions of the transactions contemplated by the Transaction Documents that will be timely publicly disclosed by the Company, the Company confirms that neither it nor any other Person acting on its behalf has provided the Investor or its agents or counsel with any information that it believes constitutes or might constitute material, non-public information which is not otherwise disclosed in the Registration Statement or the SEC Documents. The Company understands and confirms that the Investor will rely on the foregoing representation in effecting purchases and sales of securities of the Company. All of the disclosure furnished by or on behalf of the Company to the Investor regarding the Company, its business and the transactions contemplated hereby, including the disclosure schedules to this Agreement, taken together, is true and correct in all material respects. The Company acknowledges and agrees that the Investor neither makes nor has made any representations or warranties with respect to the transactions contemplated hereby other than those specifically set forth in Section 3 hereof.

(t) Foreign Corrupt Practices. Neither the Company, nor to the knowledge of the Company, any agent or other Person acting on behalf of the Company, has (i) directly or indirectly, used any funds for unlawful contributions, gifts, entertainment or other unlawful expenses related to foreign or domestic political activity, (ii) made any unlawful payment to foreign or domestic government officials or employees or to any foreign or domestic political parties or campaigns from corporate funds, (iii) failed to disclose fully any contribution made by the Company (or made by any Person acting on its behalf of which the Company is aware) which is in violation of law, or (iv) violated in any material respect any provision of the Foreign Corrupt Practices Act of 1977, as amended.

(u) Registration Statement. The Company has prepared and filed the Registration Statement with the SEC in accordance with the Securities Act. The Registration Statement was declared effective by order of the SEC on November 28, 2018. The Registration Statement is effective pursuant to the Securities Act and available for the issuance of the Securities thereunder, and the Company has not received any written notice that the SEC has issued or intends to issue a stop order or other similar order with respect to the Registration Statement or the Prospectus or that the SEC otherwise has (i) suspended or withdrawn the effectiveness of the Registration Statement or (ii) issued any order preventing or suspending the use of the Prospectus or any Prospectus Supplement, in either case, either temporarily or permanently or intends or has threatened in writing to do so. The "Plan of Distribution" section of the Prospectus permits the issuance of the Securities under the terms of this Agreement. At the time the Registration Statement and any amendments thereto became effective, at the date of this Agreement and at each deemed effective date thereof pursuant to Rule 430B(f)(2) of the Securities Act, the Registration Statement and any amendments thereto complied and will comply in all material respects with the requirements of the Securities Act and did not and will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein not misleading; and the Base Prospectus and any Prospectus Supplement thereto, at the time such Base Prospectus or such Prospectus Supplement thereto was issued and on the Commencement Date, complied and will comply in all material respects with the requirements of the Securities Act and did not and will not contain an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading; provided that this representation and warranty does not apply to statements in or omissions from any Prospectus Supplement made in reliance upon and in conformity with information relating to the Investor furnished to the Company in writing by or on behalf of the Investor expressly for use therein. The Company meets all of the requirements for the use of a registration statement on Form S-3 pursuant to the Securities Act for the offering and sale of the Securities contemplated by this Agreement in reliance on General Instruction I.B.1. of Form S-3, and the SEC has not notified the Company of any objection to the use of the form of the Registration Statement pursuant to

Rule 401(g)(1) of the Securities Act. The Company hereby confirms that the issuance of the Securities to the Investor pursuant to this Agreement would not result in non-compliance with the Securities Act or any of the General Instructions to Form S-3. The Registration Statement, as of its effective date, meets the requirements set forth in Rule 415(a)(1)(x) pursuant to the Securities Act. At the earliest time after the filing of the Registration Statement that the Company or another offering participant made a bona fide offer (within the meaning of Rule 164(h)(2) of the Securities Act) relating to any of the Securities, the Company was not, and as of the date of this Agreement the Company is not, an Ineligible Issuer (as defined in Rule 405 of the Securities Act). The Company has not distributed any offering material in connection with the offering and sale of any of the Securities, and, until the Investor does not hold any of the Securities, shall not distribute any offering material in connection with the offering and sale of any of the Securities, to or by the Investor, in each case, other than the Registration Statement or any amendment thereto, the Prospectus or any Prospectus Supplement required pursuant to applicable law or the Transaction Documents. The Company has not made and shall not make an offer relating to the Securities that would constitute a "free writing prospectus" as defined in Rule 405 under the Securities Act.

(u) DTC Eligibility. The Company, through the Transfer Agent, currently participates in the DTC Fast Automated Securities Transfer (FAST) Program and the Common Stock can be transferred electronically to third parties via the DTC Fast Automated Securities Transfer (FAST) Program.

(v) Sarbanes-Oxley. The Company is in compliance in all material respects with all provisions of the Sarbanes-Oxley Act of 2002, as amended, which are applicable to it as of the date hereof.

(w) Certain Fees. No brokerage or finder's fees or commissions are or will be payable by the Company to any broker, financial advisor or consultant, finder, placement agent, investment banker, bank or other Person with respect to the transactions contemplated by the Transaction Documents. The Investor shall have no obligation with respect to any fees or with respect to any claims made by or on behalf of other Persons for fees of a type contemplated in this Section 4(w) that may be due in connection with the transactions contemplated by the Transaction Documents.

(x) Investment Company. The Company is not, and immediately after receipt of payment for the Securities will not be, an "investment company" within the meaning of the Investment Company Act of 1940, as amended.

(y) Listing and Maintenance Requirements. 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 pursuant to the Exchange Act nor has the Company received any notification that the SEC is currently contemplating terminating such registration. Except as disclosed in the SEC Documents, the Company has not, in the twelve (12) months immediately preceding the date hereof, received any notice from any Person to the effect that the Company is not in compliance with the listing or maintenance requirements of the Principal Market. The Company is, and has no reason to believe that it will not in the foreseeable future continue to be, in compliance with all such listing and maintenance requirements. The Principal Market has not commenced any delisting proceedings against the Company.

(z) Accountants. The Company's accountants are set forth in the SEC Documents and, to the knowledge of the Company, such accountants are an independent registered public accounting firm as required by the Securities Act.

(aa) No Market Manipulation. The Company has not, and to its knowledge no Person acting on its behalf has, (i) taken, directly or indirectly, any action designed to cause or to result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of any of the

Securities, (ii) sold, bid for, purchased, or, paid any compensation for soliciting purchases of, any of the Securities, or (iii) paid or agreed to pay to any Person any compensation for soliciting another to purchase any other securities of the Company.

(bb) Shell Company Status. The Company is not currently, and has never been, an issuer identified in Rule 144(i)(1) under the Securities Act.

5. COVENANTS.

(a) Filing of Current Report and Registration Statement. The Company agrees that it shall, within the time required under the Exchange Act, file with the SEC a report on Form 8-K relating to the transactions contemplated by, and describing the material terms and conditions of, the Transaction Documents (the "Current Report"). The Company further agrees that it shall, within the time required under Rule 424(b) under the Securities Act, file with the SEC the Initial Prospectus Supplement pursuant to Rule 424(b) under the Securities Act specifically relating to the transactions contemplated by, and describing the material terms and conditions of, the Transaction Documents, containing information previously omitted at the time of effectiveness of the Registration Statement in reliance on Rule 430B under the Securities Act, and disclosing all information relating to the transactions contemplated hereby required to be disclosed in the Registration Statement and the Prospectus as of the date of the Initial Prospectus Supplement, including, without limitation, information required to be disclosed in the section captioned "Plan of Distribution" in the Prospectus. The Investor acknowledges that it will be identified in the Initial Prospectus Supplement as an underwriter within the meaning of Section 2(a)(11) of the Securities Act. The Company shall permit the Investor to review and comment upon the Current Report and the Initial Prospectus Supplement at least one (1) Business Day prior to their filing with the SEC, the Company shall give due consideration to all such comments, and the Company shall not file the Current Report or the Initial Prospectus Supplement with the SEC in a form to which the Investor reasonably objects. The Investor shall use its reasonable best efforts to comment upon the Current Report and the Initial Prospectus Supplement as promptly as practicable after the Investor receives the pre-filing draft version thereof from the Company. The Investor shall furnish to the Company such information regarding itself, the Securities held by it and the intended method of distribution thereof, including any arrangement between the Investor and any other Person relating to the sale or distribution of the Securities, as shall be reasonably requested by the Company in connection with the preparation and filing of the Current Report and the Initial Prospectus Supplement, and shall otherwise cooperate with the Company as reasonably requested by the Company in connection with the preparation and filing of the Current Report and the Initial Prospectus Supplement with the SEC.

(b) Blue Sky. The Company shall take all such action, if any, as is reasonably necessary in order to obtain an exemption for or to register or qualify (i) the issuance of the Commitment Shares and the sale of the Purchase Shares to the Investor under this Agreement and (ii) any subsequent resale of all Commitment Shares and all Purchase Shares by the Investor, in each case, under applicable securities or "Blue Sky" laws of the states of the United States in such states as is reasonably requested by the Investor from time to time, and shall provide evidence of any such action so taken to the Investor.

(c) Listing/DTC. The Company shall promptly secure the listing of all of the Purchase Shares and Commitment Shares to be issued to the Investor hereunder on the Principal Market (subject to official notice of issuance) and upon each other national securities exchange or automated quotation system, if any, upon which the Common Stock is then listed, and shall maintain, so long as any shares of Common Stock shall be so listed, such listing of all such Securities from time to time issuable hereunder. The Company shall use reasonable best efforts to maintain the listing of the Common Stock on the Principal Market and shall comply in all respects with the Company's reporting, filing and other obligations under the bylaws or rules and regulations of the Principal Market. Neither the Company nor any of its Subsidiaries shall take any action that would reasonably be expected to result in the delisting or suspension of the Common Stock

on the Principal Market. The Company shall promptly, and in no event later than the following Business Day, provide to the Investor copies of any notices it receives from any Person regarding the continued eligibility of the Common Stock for listing on the Principal Market; provided, however, that the Company shall not be required to provide the Investor copies of any such notice that the Company reasonably believes constitutes material non-public information and the Company would not be required to publicly disclose such notice in any report or statement filed with the SEC and under the Exchange Act or the Securities Act. The Company shall pay all fees and expenses in connection with satisfying its obligations under this Section 5(c). The Company shall take all action necessary to ensure that its Common Stock can be transferred electronically as DWAC Shares.

(d) Prohibition of Short Sales and Hedging Transactions. The Investor agrees that beginning on the date of this Agreement and ending on the date of termination of this Agreement as provided in Section 11, the Investor and its agents, representatives and affiliates shall not in any manner whatsoever enter into or effect, directly or indirectly, any (i) "short sale" (as such term is defined in Rule 200 of Regulation SHO of the Exchange Act) of the Common Stock or (ii) hedging transaction, which establishes a net short position with respect to the Common Stock.

(e) Issuance of Commitment Shares. In consideration for the Investor's execution and delivery of this Agreement, the Company shall cause to be issued to the Investor a total of 1,529,052 shares of Common Stock (the "Initial Commitment Shares") not later than the close of business on the next Business Day immediately following the date of this Agreement and shall, concurrently with the execution of this Agreement on the date hereof, deliver to the Transfer Agent the Irrevocable Transfer Agent Instructions with respect to the issuance of such Commitment Shares to the Investor within such time period. The Company shall cause to be issued to the Investor up to 917,431 shares of Common Stock (the "Additional Commitment Shares" and, collectively with the Initial Commitment Shares, the "Commitment Shares"), as follows: in connection with each purchase of Purchase Shares hereunder, the Company shall issue to the Investor a number of shares of Common Stock equal to the product of (i) 917,431 and (y) the Purchase Amount Fraction. The "Purchase Amount Fraction" shall mean a fraction, the numerator of which is the Purchase Amount purchased by the Investor with respect to such purchase of Purchase Shares and the denominator of which is Twenty Million Dollars ($20,000,000). The Additional Commitment Shares shall be equitably adjusted for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction. For the avoidance of doubt, (1) all of the Initial Commitment Shares shall be fully earned as of the date of this Agreement, whether or not the Commencement shall occur or any Purchase Shares are purchased by the Investor under this Agreement and irrespective of any subsequent termination of this Agreement and (2) the Additional Commitment Shares shall be fully earned as of the date of their issuance pursuant to this Agreement, whether or not any additional Purchase Shares are purchased thereafter by the Investor under this Agreement and irrespective of any subsequent termination of this Agreement.

(f) Due Diligence; Non-Public Information. The Investor shall have the right, from time to time as the Investor may reasonably deem appropriate and upon reasonable advance notice to the Company, to perform reasonable due diligence on the Company during normal business hours. The Company and its officers and employees shall provide information and reasonably cooperate with the Investor in connection with any reasonable request by the Investor related to the Investor's due diligence of the Company. Each party hereto agrees not to disclose any Confidential Information of the other party to any third party and shall not use the Confidential Information for any purpose other than in connection with, or in furtherance of, the transactions contemplated hereby. Each party hereto acknowledges that the Confidential Information shall remain the property of the disclosing party and agrees that it shall take all reasonable measures to protect the secrecy of any Confidential Information disclosed by the other party. The Company confirms that neither it nor any other Person acting on its behalf shall provide the Investor or its agents or counsel with any information that constitutes or might constitute material, non-public information, unless a simultaneous public announcement thereof is made by the Company in the manner contemplated by

Regulation FD. In the event of a breach of the foregoing covenant by the Company or any Person acting on its behalf (as determined in the reasonable good faith judgment of the Investor), in addition to any other remedy provided herein or in the other Transaction Documents, if the Investor is holding any Securities at the time of the disclosure of material, non-public information, the Investor shall have the right to make a public disclosure, in the form of a press release, public advertisement or otherwise, of such material, non-public information without the prior approval by the Company; provided the Investor shall have first provided notice to the Company that it believes it has received information that constitutes material, non-public information, the Company shall have at least 48 hours to publicly disclose such material, non-public information prior to any such disclosure by the Investor, the Company shall have failed to demonstrate to the Investor in writing within such time period that such information does not constitute material, non-public information, and the Company shall have failed to publicly disclose such material, non-public information within such time period. The Investor shall not have any liability to the Company, any of its Subsidiaries, or any of their respective directors, officers, employees, stockholders or agents, for any such disclosure. The Company understands and confirms that the Investor shall be relying on the foregoing covenants in effecting transactions in securities of the Company.

(g) Purchase Records. The Investor and the Company shall each maintain records showing the remaining Available Amount at any given time and the dates and Purchase Amounts for each Regular Purchase, Accelerated Purchase and Additional Accelerated Purchase or shall use such other method, reasonably satisfactory to the Investor and the Company.

(h) Taxes. The Company shall pay any and all transfer, stamp or similar taxes that may be payable with respect to the issuance and delivery of any shares of Common Stock to the Investor made under this Agreement.

(i) Effective Registration Statement; Current Prospectus; Securities Law Compliance. The Company shall use its reasonable best efforts to keep the Registration Statement effective pursuant to Rule 415 promulgated under the Securities Act, and to keep the Registration Statement and the Prospectus current and available for issuances and sales of all of the Securities by the Company to the Investor, and for the resale by the Investor, at all times until the earlier of (i) the date on which the Investor shall have sold all the Securities and no Available Amount remains under this Agreement and (ii) 180 days following the Maturity Date (the "Registration Period"). Without limiting the generality of the foregoing, during the Registration Period, the Company shall (a) take all action necessary to continue to be required to file reports with the Commission pursuant to Section 13 or 15(d) of the Exchange Act, shall comply with its reporting and filing obligations under the Exchange Act, and shall not take any action or file any document (whether or not permitted by the Exchange Act) to terminate or suspend its reporting and filing obligations under the Exchange Act and (b) prepare and file with the SEC, at the Company's expense, such amendments (including, without limitation, post-effective amendments) to the Registration Statement and such Prospectus Supplements pursuant to Rule 424(b) under the Securities Act, in each case, as may be necessary to keep the Registration Statement effective pursuant to Rule 415 promulgated under the Securities Act, and to keep the Registration Statement and the Prospectus current and available for issuances and sales of all of the Securities by the Company to the Investor, and for the resale of all of the Securities by the Investor, at all times during the Registration Period (it being hereby acknowledged and agreed that the Company shall prepare and file with the SEC, at the Company's expense, immediately prior to the third anniversary of the initial effective date of the Registration Statement (the "Renewal Date"), a new Registration Statement relating to the Securities, in a form satisfactory to the Investor and its counsel, and the Company shall use its reasonable best efforts to cause such Registration Statement to be declared effective within 180 days after the Renewal Date). The Investor shall furnish to the Company such information regarding itself, the Securities held by it and the intended method of distribution thereof as shall be reasonably requested by the Company in connection with the preparation and filing of any such amendment to the Registration Statement (or new Registration Statement) or any such Prospectus Supplement, and shall otherwise

cooperate with the Company as reasonably requested by the Company in connection with the preparation and filing of any such amendment to the Registration Statement (or new Registration Statement) or any such Prospectus Supplement. The Company shall comply with all applicable federal, state and foreign securities laws in connection with the offer, issuance and sale of the Securities contemplated by the Transaction Documents. Without limiting the generality of the foregoing, neither the Company nor any of its officers, directors or affiliates will take, directly or indirectly, any action designed or intended to stabilize or manipulate the price of any security of the Company, or which would reasonably be expected to cause or result in, stabilization or manipulation of the price of any security of the Company.

(j) Stop Orders. The Company shall advise the Investor promptly (but in no event later than 24 hours) and shall confirm such advice in writing: (i) of the Company's receipt of notice of any request by the SEC for amendment of or a supplement to the Registration Statement, the Prospectus, any Prospectus Supplement or for any additional information; (ii) of the Company's receipt of notice of the issuance by the SEC of any stop order suspending the effectiveness of the Registration Statement or prohibiting or suspending the use of the Prospectus or any Prospectus Supplement, or of the Company's receipt of any notification of the suspension of qualification of the Securities for offering or sale in any jurisdiction or the initiation or contemplated initiation of any proceeding for such purpose; and (iii) of the Company becoming aware of the happening of any event, which makes any statement of a material fact made in the Registration Statement, the Prospectus or any Prospectus Supplement untrue or which requires the making of any additions to or changes to the statements then made in the Registration Statement, the Prospectus or any Prospectus Supplement in order to state a material fact required by the Securities Act to be stated therein or necessary in order to make the statements then made therein (in the case of the Prospectus or any Prospectus Supplement, in light of the circumstances under which they were made) not misleading, or of the necessity to amend the Registration Statement or supplement the Prospectus or any Prospectus Supplement to comply with the Securities Act or any other law. The Company shall not be required to disclose to the Investor the substance or specific reasons of any of the events set forth in clauses (i) through (iii) of the immediately preceding sentence, but rather, shall only be required to disclose that the event has occurred. The Company shall not deliver to the Investor any Regular Purchase Notice or Accelerated Purchase Notice, and the Investor shall not be obligated to purchase any shares of Common Stock under this Agreement, during the continuation or pendency of any of the foregoing events. If at any time the SEC shall issue any stop order suspending the effectiveness of the Registration Statement or prohibiting or suspending the use of the Prospectus or any Prospectus Supplement, the Company shall use its reasonable best efforts to obtain the withdrawal of such order at the earliest possible time. The Company shall furnish to the Investor, without charge, a copy of any correspondence from the SEC or the staff of the SEC to the Company or its representatives relating to the Registration Statement or the Prospectus, as the case may be.

(k) Amendments to Registration Statement; Prospectus Supplements. Except as provided in this Agreement and other than periodic and current reports required to be filed pursuant to the Exchange Act, the Company shall not file with the SEC any amendment to the Registration Statement or any supplement to the Base Prospectus that refers to the Investor, the Transaction Documents or the transactions contemplated thereby (including, without limitation, any Prospectus Supplement filed in connection with the transactions contemplated by the Transaction Documents), in each case with respect to which (a) the Investor shall not previously have been advised and afforded the opportunity to review and comment thereon at least one (1) Business Day prior to filing with the SEC, as the case may be, (b) the Company shall not have given due consideration to any comments thereon received from the Investor or its counsel, or (c) the Investor shall reasonably object, unless the Company reasonably has determined that it is necessary to amend the Registration Statement or make any supplement to the Prospectus to comply with the Securities Act or any other applicable law or regulation, in which case the Company shall promptly (but in no event later than 24 hours) so inform the Investor, the Investor shall be provided with a reasonable opportunity to review and comment upon any disclosure referring to the Investor, the Transaction Documents or the transactions contemplated thereby, as applicable, and the Company shall expeditiously

furnish to the Investor a copy thereof. In addition, for so long as, in the reasonable opinion of counsel for the Investor, the Prospectus is required to be delivered in connection with any acquisition or sale of Securities by the Investor, the Company shall not file any Prospectus Supplement with respect to the Securities without furnishing to the Investor as many copies of such Prospectus Supplement, together with the Prospectus, as the Investor may reasonably request.

(l) Prospectus Delivery. The Company consents to the use of the Prospectus (and of each Prospectus Supplement thereto) in accordance with the provisions of the Securities Act and with the securities or "blue sky" laws of the jurisdictions in which the Securities may be sold by the Investor, in connection with the offering and sale of the Securities and for such period of time thereafter as the Prospectus is required by the Securities Act to be delivered in connection with sales of the Securities. The Company will make available to the Investor upon request, and thereafter from time to time will furnish to the Investor, as many copies of the Prospectus (and each Prospectus Supplement thereto) as the Investor may reasonably request for the purposes contemplated by the Securities Act within the time during which the Prospectus is required by the Securities Act to be delivered in connection with sales of the Securities. If during such period of time any event shall occur that in the reasonable judgment of the Company and its counsel, or in the reasonable judgment of the Investor and its counsel, is required to be set forth in the Registration Statement, the Prospectus or any Prospectus Supplement or should be set forth therein in order to make the statements made therein (in the case of the Prospectus or any Prospectus Supplement, in light of the circumstances under which they were made) not misleading, or if in the reasonable judgment of the Company and its counsel, or in the reasonable judgment of the Investor and its counsel, it is otherwise necessary to amend the Registration Statement or supplement the Prospectus or any Prospectus Supplement to comply with the Securities Act or any other applicable law or regulation, the Company shall forthwith prepare and, subject to Section 5(k) above, file with the SEC an appropriate amendment to the Registration Statement or an appropriate Prospectus Supplement and in each case shall expeditiously furnish to the Investor, at the Company's expense, such amendment to the Registration Statement or such Prospectus Supplement, as applicable, as may be necessary to reflect any such change or to effect such compliance. The Company shall have no obligation to separately advise the Investor of, or deliver copies to the Investor of, the SEC Documents, all of which the Investor shall be deemed to have notice of.

(m) Integration. From and after the date of this Agreement, neither the Company, nor or any of its affiliates will, and the Company shall use its reasonable best efforts to ensure that no Person acting on their behalf will, directly or indirectly, make any offers or sales of any security or solicit any offers to buy any security, under circumstances that would cause this offering of the Securities by the Company to the Investor to be integrated with other offerings by the Company in a manner that would require stockholder approval pursuant to the rules of the Principal Market on which any of the securities of the Company are listed or designated, unless stockholder approval is obtained before the closing of such subsequent transaction in accordance with the rules of such Principal Market.

(n) Use of Proceeds. The Company will use the net proceeds from the offering as described in the Prospectus.

(o) Other Transactions. The Company shall not enter into, announce or recommend to its stockholders any agreement, plan, arrangement or transaction in or of which the terms thereof would restrict, materially delay, conflict with or impair the ability or right of the Company to perform its obligations under the Transaction Documents, including, without limitation, the obligation of the Company to deliver the Purchase Shares and the Commitment Shares to the Investor in accordance with the terms of the Transaction Documents.

(p) Required Filings Relating to Purchases. To the extent required under the Securities Act or under interpretations by the SEC thereof, as promptly as practicable after the close of each of the Company's

fiscal quarters (or on such other dates as required under the Securities Act or under interpretations by the SEC thereof), the Company shall prepare a Prospectus Supplement, which will set forth the number of Purchase Shares sold to the Investor during such quarterly period (or other relevant period), the purchase price for such Purchase Shares and the net proceeds received by the Company from such sales, and shall file such Prospectus Supplement with the SEC pursuant to Rule 424(b) under the Securities Act (and within the time periods required by Rule 424(b) and Rule 430B under the Securities Act). If any such quarterly Prospectus Supplement is not required to be filed under the Securities Act or under interpretations by the SEC thereof, the Company shall disclose the information referenced in the immediately preceding sentence in its annual report on Form 10-K or its quarterly report on Form 10-Q (as applicable) in respect of the quarterly period that ended immediately before the filing of such report in which sales of Purchase Shares were made to the Investor under this Agreement, and file such report with the SEC within the applicable time period required by the Exchange Act. The Company shall not file any Prospectus Supplement pursuant to this Section 5(p), and shall not file any report containing disclosure relating to such sales of Purchase Shares, unless a copy of such Prospectus Supplement or disclosure has been submitted to the Investor a reasonable period of time before the filing and the Investor has not reasonably objected thereto (it being acknowledged and agreed that the Company shall not submit any portion of any Form 10-K or Form 10-Q other than the specific disclosure relating to any sales of Purchase Shares). The Company shall also furnish copies of all such Prospectus Supplements to each exchange or market in the United States on which sales of the Purchase Shares may be made as may be required by the rules or regulations of such exchange or market, if applicable.

(q) Limitation on Variable Rate Transactions. From and after the date of this Agreement until the 36-month anniversary of the date of this Agreement (irrespective of any earlier termination of this Agreement) (such period, the "Restricted Period"), (i) the Company shall be prohibited from effecting or entering into an agreement to effect any continuous offering of Common Stock or Common Stock Equivalents that could constitute, or could be deemed to constitute, an "equity line of credit," in which the Company may issue or sell Common Stock or Common Stock Equivalents at a future determined price to a Person other than the Investor or any affiliate of the Investor (an "ELOC"), excluding (A) the issuance or sale of any Securities to the Investor or any affiliate or designee of the Investor pursuant to this Agreement or any of the Transaction Documents, as the same may be amended from time to time, (B) the issuance or sale of any shares of Common Stock, Common Stock Equivalents or any other securities of the Company (or a combination of units thereof) to the Investor or any affiliate or designee of the Investor pursuant to any other agreement or arrangement between the Investor or any of its affiliates, on the one hand, and the Company or any of its Subsidiaries, on the other hand, entered into by and between such parties after the date of this Agreement, if any, and (C) the issuance or sale of any shares of Common Stock, Common Stock Equivalents or other securities of the Company (or a combination of units thereof) to the Investor or any affiliate of the Investor upon the exercise, exchange or conversion of any shares of Common Stock, Common Stock Equivalents or other securities owned or held, directly or indirectly, by the Investor or any affiliate of the Investor at any time, and (ii) the Company shall be prohibited from effecting or entering into an agreement to effect any issuance by the Company or any of its Subsidiaries of Common Stock or Common Stock Equivalents (or a combination of units thereof) involving a Variable Rate Transaction, other than in the case of this clause (ii) in connection with an Exempt Issuance. The Investor shall be entitled to seek injunctive relief against the Company and its Subsidiaries to preclude any such issuance, which remedy shall be in addition to any right to collect damages, without the necessity of showing economic loss and without any bond or other security being required. "Common Stock Equivalents" means any securities of the Company or its Subsidiaries which entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock. "Variable Rate Transaction" means a transaction in which the Company (i) issues or sells any equity or debt securities that are convertible into, exchangeable or exercisable for, or include the right to receive additional shares of Common Stock or Common Stock Equivalents either (A) at a

conversion price, exercise price, exchange rate or other price that is based upon and/or varies with the trading prices of or quotations for the Common Stock at any time after the initial issuance of such equity or debt securities and is not subject to a "floor" or minimum price limitation equal to or greater than $0.30 per share (to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction) (as may be adjusted from time to time, the "Threshold Price") or (B) with a conversion, exercise or exchange price that is subject to being reset to a lower price, which is not subject to a "floor" or minimum price limitation equal to or greater than the Threshold Price, at some future date after the initial issuance of such equity or debt security or upon the occurrence of specified or contingent events directly or indirectly related to the business of the Company or the market for the Common Stock, excluding any pro rata adjustment for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction, (ii) issues or sells any equity or debt securities, including without limitation, Common Stock or Common Stock Equivalents, at a price that is subject to being reset to a lower price, which is not subject to a "floor" or minimum price limitation equal to or greater than the Threshold Price, at some future date after the initial issuance of such debt or equity security or upon the occurrence of specified or contingent events directly or indirectly related to the business of the Company or the market for the Common Stock, excluding any pro rata adjustment for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction, or (iii) effects or enters into any agreement to effect an "at-the-market offering" or other similar continuous offering of Common Stock or Common Stock Equivalents, whereby the Company may sell Common Stock or Common Stock Equivalents at a future determined price (excluding an ELOC, which the Company is restricted from effecting or entering into any agreement to effect under the first sentence of this Section 5(q), which shall apply to any ELOC, subject to the exceptions set forth in clauses (A), (B) and (C) above). "Exempt Issuance" means the issuance of (a) Common Stock, options or other equity incentive awards to employees, officers, directors or vendors of the Company pursuant to any equity incentive plan duly adopted for such purpose, by the Board of Directors or a majority of the members of a committee of directors established for such purpose, (b)(1) the issuance or sale of any Securities to the Investor or any affiliate or designee of the Investor pursuant to this Agreement or any of the Transaction Documents, as the same may be amended from time to time, (2) the issuance or sale of any shares of Common Stock, Common Stock Equivalents or any other debt or equity securities of the Company (or a combination of units thereof) to the Investor or any affiliate or designee of the Investor pursuant to any other agreement or arrangement between the Investor or any of its affiliates, on the one hand, and the Company or any of its Subsidiaries, on the other hand, entered into by and between such parties after the date of this Agreement, if any, and (3) the issuance or sale of any shares of Common Stock, Common Stock Equivalents or other debt or equity securities of the Company (or a combination of units thereof) to the Investor or any affiliate of the Investor upon the exercise, exchange or conversion of any shares of Common Stock, Common Stock Equivalents or other debt or equity securities owned or held, directly or indirectly, by the Investor or any affiliate of the Investor at any time, (c) any shares of Common Stock, Common Stock Equivalents or any other debt or equity securities of the Company issued upon the exercise or exchange of or conversion of any Common Stock Equivalents issued and outstanding on the date of this Agreement, provided that such securities referred to in this clause (c) have not been amended since the date of this Agreement to increase the number of such securities or to decrease the exercise price, exchange price or conversion price of such securities, (d) any shares of Common Stock, Common Stock Equivalents or any other debt or equity securities of the Company (or a combination of units thereof) issued pursuant to acquisitions, divestitures, licenses, partnerships, collaborations or strategic transactions approved by the Board of Directors or a majority of the members of a committee of directors established for such purpose, which acquisitions, divestitures, licenses, partnerships, collaborations or strategic transactions can have a Variable Rate Transaction component, provided that any such issuance shall only be to a Person (or to the equity holders of a Person) which is, itself or through its subsidiaries, an operating company or an asset in a business synergistic with the business of the Company and shall provide to the Company additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities, (e) Common Stock issued pursuant to an "at-the-market

offering" by the Company exclusively through a registered broker-dealer acting as agent of the Company pursuant to a written agreement between the Company and such registered broker-dealer, or (f) any shares of Common Stock, Common Stock Equivalents or any other debt or equity securities of the Company issued (A) at a fixed price that is equal to or greater than the Threshold Price, subject only to pro rata adjustment for any reorganization, recapitalization, non-cash dividend, stock split or other similar transaction, (B) at a price that is based upon and/or varies with the trading prices of or quotations for the Common Stock at any time after the initial issuance of such debt or preferred securities, but is subject to a "floor" or minimum price limitation equal to or greater than the Threshold Price, or (C) at a price that is subject to being reset to a lower price, which is subject to a "floor" or minimum price limitation equal to or greater than the Threshold Price, at some future date after the initial issuance of such debt security or upon the occurrence of specified or contingent events directly or indirectly related to the business of the Company or the market for the Common Stock.

6. TRANSFER AGENT INSTRUCTIONS.

On the date of this Agreement, the Company shall issue to the Transfer Agent (and any subsequent transfer agent) irrevocable instructions, in the form substantially similar to those used by the Investor in substantially similar transactions, to issue the Purchase Shares and the Commitment Shares in accordance with the terms of this Agreement (the "Irrevocable Transfer Agent Instructions"). All Securities to be issued to or for the benefit of the Investor pursuant to this Agreement shall be issued as DWAC Shares. The Company represents and warrants to the Investor that no instruction other than the Irrevocable Transfer Agent Instructions referred to in this Section 6 will be given by the Company to the Transfer Agent with respect to the Securities, and the Securities shall otherwise be freely transferable on the books and records of the Company. If the Investor effects a sale, assignment or transfer of the Purchase Shares, the Company shall permit the transfer and shall promptly instruct the Transfer Agent (and any subsequent transfer agent) to issue DWAC Shares in such name and in such denominations as specified by the Investor to effect such sale, transfer or assignment. The Company shall take all actions to carry out the intent and accomplish the purposes of this Section 6, including, without limitation, delivering or causing to be delivered all such legal opinions, consents, certificates, resolutions and instructions to the Transfer Agent, and any successor transfer agent of the Company, as may be requested from time to time by the Investor or necessary or desirable to carry out the intent and accomplish the purposes of this Section 6, and all fees and costs associated therewith shall be borne by the Company.

7. CONDITIONS TO THE COMPANY'S RIGHT TO COMMENCE SALES OF SHARES OF COMMON STOCK.

The right of the Company hereunder to commence sales of the Purchase Shares on the Commencement Date is subject to the satisfaction or, where legally permissible, the waiver of each of the following conditions:

(a) The Investor shall have executed each of the Transaction Documents and delivered the same to the Company;

(b) No stop order with respect to the Registration Statement shall be pending or threatened by the SEC; and

(c) The representations and warranties of the Investor shall be true and correct in all material respects as of the date hereof and as of the Commencement Date as though made at that time.

8. CONDITIONS TO THE INVESTOR'S OBLIGATION TO PURCHASE SHARES OF COMMON STOCK.

The obligation of the Investor to buy Purchase Shares under this Agreement is subject to the satisfaction or, where legally permissible, the waiver of each of the following conditions on or prior to the Commencement Date and, once such conditions have been initially satisfied, there shall not be any ongoing obligation to satisfy such conditions after the Commencement has occurred:

(a) The Company shall have executed each of the Transaction Documents and delivered the same to the Investor;

(b) The Common Stock shall be listed on the Principal Market and all Securities to be issued by the Company to the Investor pursuant to this Agreement shall have been approved for listing on the Principal Market in accordance with the applicable rules and regulations of the Principal Market, subject only to official notice of issuance;

(c) The Investor shall have received the opinions of the Company's legal counsel dated as of the Commencement Date substantially in the forms agreed to prior to the date of this Agreement by the Company's legal counsel and the Investor's legal counsel;

(d) The representations and warranties of the Company shall be true and correct in all material respects (except to the extent that any of such representations and warranties is already qualified as to materiality in Section 4 above, in which case, such representations and warranties shall be true and correct without further qualification) as of the date when made and as of the Commencement Date as though made at that time (except for representations and warranties that speak as of a specific date) and the Company shall have performed, satisfied and complied with the covenants, agreements and conditions required by the Transaction Documents to be performed, satisfied or complied with by the Company at or prior to the Commencement Date. The Investor shall have received a certificate, executed by the CEO, President or CFO of the Company, dated as of the Commencement Date, to the foregoing effect in the form attached hereto as **Exhibit A**;

(e) The Board of Directors of the Company shall have adopted resolutions substantially in the form attached hereto as **Exhibit B**, which shall be in full force and effect without any amendment or supplement thereto as of the Commencement Date;

(f) As of the Commencement Date, the Company shall have reserved out of its authorized and unissued Common Stock, (i) solely for the purpose of effecting purchases of Purchase Shares hereunder, 37,553,517 shares of Common Stock and (ii) as Additional Commitment Shares in accordance with Section 5(e) hereof, 917,431 shares of Common Stock;

(g) The Irrevocable Transfer Agent Instructions shall have been delivered to and acknowledged in writing by the Company and the Company's Transfer Agent, and the Initial Commitment Shares required to have been issued on the Commencement Date in accordance with Section 5(e) hereof shall have been issued directly to the Investor electronically as DWAC Shares;

(h) The Company shall have delivered to the Investor a certificate evidencing the incorporation and good standing of the Company in the State of Delaware issued by the Secretary of State of the State of Delaware as of a date within ten (10) Business Days of the Commencement Date;

(i) The Company shall have delivered to the Investor a certified copy of the Certificate of Incorporation as certified by the Secretary of State of the State of Delaware within ten (10) Business Days of the Commencement Date;

(j) The Company shall have delivered to the Investor a secretary's certificate executed by the Secretary of the Company, dated as of the Commencement Date, in the form attached hereto as **Exhibit C**;

(k) The Registration Statement shall continue to be effective and no stop order with respect to the Registration Statement shall be pending or threatened by the SEC. The Company shall have a maximum dollar amount certain of Common Stock registered under the Registration Statement which is sufficient to issue to the Investor not less than (i) the full Available Amount worth of Purchase Shares plus (ii) all of the Commitment Shares. The Current Report and the Initial Prospectus Supplement each shall have been filed with the SEC, as required pursuant to Section 5(a), and copies of the Prospectus shall have been delivered to the Investor in accordance with Section 5(l) hereof. The Prospectus shall be current and available for issuances and sales of all of the Securities by the Company to the Investor, and for the resale of all of the Securities by the Investor. Any other Prospectus Supplements required to have been filed by the Company with the SEC under the Securities Act at or prior to the Commencement Date shall have been filed with the SEC within the applicable time periods prescribed for such filings under the Securities Act. All reports, schedules, registrations, forms, statements, information and other documents required to have been filed by the Company with the SEC at or prior to the Commencement Date pursuant to the reporting requirements of the Exchange Act shall have been filed with the SEC within the applicable time periods prescribed for such filings under the Exchange Act;

(l) No Event of Default has occurred, or any event which, after notice and/or lapse of time, would become an Event of Default has occurred;

(m) All federal, state and local governmental laws, rules and regulations applicable to the transactions contemplated by the Transaction Documents and necessary for the execution, delivery and performance of the Transaction Documents and the consummation of the transactions contemplated thereby in accordance with the terms thereof shall have been complied with, and all consents, authorizations and orders of, and all filings and registrations with, all federal, state and local courts or governmental agencies and all federal, state and local regulatory or self-regulatory agencies necessary for the execution, delivery and performance of the Transaction Documents and the consummation of the transactions contemplated thereby in accordance with the terms thereof shall have been obtained or made, including, without limitation, in each case those required under the Securities Act, the Exchange Act, applicable state securities or "Blue Sky" laws or applicable rules and regulations of the Principal Market, or otherwise required by the SEC, the Principal Market or any state securities regulators;

(n) No statute, regulation, order, decree, writ, ruling or injunction shall have been enacted, entered, promulgated, threatened or endorsed by any federal, state, local or foreign court or governmental authority of competent jurisdiction which prohibits the consummation of or which would materially modify or delay any of the transactions contemplated by the Transaction Documents; and

(o) No action, suit or proceeding before any federal, state, local or foreign arbitrator or any court or governmental authority of competent jurisdiction shall have been commenced or threatened, and no inquiry or investigation by any federal, state, local or foreign governmental authority of competent jurisdiction shall have been commenced or threatened, against the Company, or any of the officers, directors or affiliates of the Company, seeking to restrain, prevent or change the transactions contemplated by the Transaction Documents, or seeking material damages in connection with such transactions.

9. INDEMNIFICATION.

In consideration of the Investor's execution and delivery of the Transaction Documents and acquiring the Securities hereunder and in addition to all of the Company's other obligations under the Transaction Documents, the Company shall defend, protect, indemnify and hold harmless the Investor and all of its affiliates, stockholders, members, officers, directors, employees and direct or indirect investors and any of the foregoing Person's agents or other representatives (including, without limitation, 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, and expenses in connection therewith (irrespective of whether any such Indemnitee is a party to the action for which indemnification hereunder is sought), and including reasonable attorneys' fees and disbursements (the "Indemnified Liabilities"), incurred by any Indemnitee as a result of, or arising out of, relating to: (a) any misrepresentation or breach of any representation or warranty made by the Company in the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (b) any breach of any covenant, agreement or obligation of the Company contained in the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (c) any cause of action, suit or claim brought or made against such Indemnitee and arising out of or resulting from the execution, delivery, performance or enforcement of the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (d) any violation of the Securities Act, the Exchange Act, state securities or "Blue Sky" laws, or the rules and regulations of the Principal Market in connection with the transactions contemplated by the Transaction Documents by the Company or any of its Subsidiaries, affiliates, officers, directors or employees, (e) any untrue statement or alleged untrue statement of a material fact contained, or incorporated by reference, in the Registration Statement or any amendment thereto or any omission or alleged omission to state therein, or in any document incorporated by reference therein, a material fact required to be stated therein or necessary to make the statements therein not misleading, or (f) any untrue statement or alleged untrue statement of a material fact contained, or incorporated by reference, in the Prospectus, or any omission or alleged omission to state therein, or in any document incorporated by reference therein, a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; provided, however, that (I) the indemnity contained in clause (c) of this Section 9 shall not apply to any Indemnified Liabilities which directly and primarily result from the fraud, gross negligence or willful misconduct of an Indemnitee, (II) the indemnity contained in clauses (d), (e) and (f) of this Section 9 shall not apply to any Indemnified Liabilities to the extent, but only to the extent, arising out of or based upon any untrue statement or alleged untrue statement or omission or alleged omission made in reliance upon and in conformity with written information furnished to the Company by or on behalf of the Investor expressly for use in any Prospectus Supplement (it being hereby acknowledged and agreed that the written information set forth on **Exhibit D** attached hereto is the only written information furnished to the Company by or on behalf of the Investor expressly for use in the Initial Prospectus Supplement), if the Prospectus was timely made available by the Company to the Investor pursuant to Section 5(l), (III) the indemnity contained in clauses (d), (e) and (f) of this Section 9 shall not inure to the benefit of the Investor to the extent such Indemnified Liabilities are based on a failure of the Investor to deliver or to cause to be delivered the Prospectus made available by the Company, if such Prospectus was timely made available by the Company pursuant to Section 5(l), and if delivery of the Prospectus would have cured the defect giving rise to such Indemnified Liabilities, and (IV) the indemnity in this Section 9 shall not apply to amounts paid in settlement of any claim if such settlement is effected without the prior written consent of the Company, which consent shall not be unreasonably withheld, conditioned or delayed. 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 which is permissible under applicable law. Payment under this indemnification shall be made within thirty (30) days from the date the Investor makes written request for it. A certificate containing reasonable detail as to the amount of such indemnification submitted to the Company by Investor shall be conclusive evidence, absent manifest

error, of the amount due from the Company to Investor. If any action shall be brought against any Indemnitee in respect of which indemnity may be sought pursuant to this Agreement, such Indemnitee shall promptly notify the Company in writing, and the Company shall have the right to assume the defense thereof with counsel of its own choosing reasonably acceptable to the Indemnitee. Any Indemnitee shall have the right to employ separate counsel in any such action and participate in the defense thereof, but the fees and expenses of such counsel shall be at the expense of such Indemnitee, except to the extent that (i) the employment thereof has been specifically authorized by the Company in writing, (ii) the Company has failed after a reasonable period of time to assume such defense and to employ counsel or (iii) in such action there is, in the reasonable opinion of such separate counsel, a material conflict on any material issue between the position of the Company and the position of such Indemnitee, in which case the Company shall be responsible for the reasonable fees and expenses of no more than one such separate counsel.

10. EVENTS OF DEFAULT.

An "Event of Default" shall be deemed to have occurred at any time as any of the following events occurs:

(a) the effectiveness of the Registration Statement registering the Securities lapses for any reason (including, without limitation, the issuance of a stop order) or the Registration Statement or the Prospectus is unavailable for the sale by the Company to the Investor (or the resale by the Investor) of any or all of the Securities to be issued to the Investor under the Transaction Documents (including, without limitation, as a result of any failure of the Company to satisfy all of the requirements for the use of a registration statement on Form S-3 pursuant to the Securities Act for the offering and sale of the Securities contemplated by this Agreement), and such lapse or unavailability continues for a period of ten (10) consecutive Business Days or for more than an aggregate of thirty (30) Business Days in any 365-day period;

(b) the suspension of the Common Stock from trading or the failure of the Common Stock to be listed on the Principal Market for a period of one (1) Business Day, provided that the Company may not direct the Investor to purchase shares of Common Stock during any such suspension;

(c) the delisting of the Common Stock from the OTCQX operated by the OTC Markets Group, Inc. (or nationally recognized successor thereto), provided, however, that the Common Stock is not immediately thereafter trading on the New York Stock Exchange, The NASDAQ Capital Market, The NASDAQ Global Market, The NASDAQ Global Select Market, the NYSE American, the NYSE Arca, the OTC Bulletin Board or the OTCQB operated by the OTC Markets Group, Inc. (or nationally recognized successor to any of the foregoing);

(d) the failure for any reason by the Transfer Agent to issue (i) the Additional Commitment Shares to the Investor within two (2) Business Days after the date on which the Investor is entitled to receive such Additional Commitment Shares pursuant to Section 5(e) hereof and (ii) Purchase Shares to the Investor within two (2) Business Days after the Purchase Date, Accelerated Purchase Date, Additional Accelerated Purchase Date or Tranche Purchase Date, as applicable, on which the Investor is entitled to receive such Purchase Shares;

(e) the Company breaches any representation, warranty, covenant or other term or condition under any Transaction Document if such breach would reasonably be expected to have a Material Adverse Effect and except, in the case of a breach of a covenant which is reasonably curable, only if such breach continues for a period of at least five (5) Business Days;

(f) if any Person commences a proceeding against the Company pursuant to or within the meaning of any Bankruptcy Law;

(g) if the Company pursuant to or within the meaning of any Bankruptcy Law: (i) commences a voluntary case, (ii) consents to the entry of an order for relief against it in an involuntary case, (iii) consents to the appointment of a Custodian of it or for all or substantially all of its property, or (iv) makes a general assignment for the benefit of its creditors or is generally unable to pay its debts as the same become due;

(h) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that (i) is for relief against the Company in an involuntary case, (ii) appoints a Custodian of the Company or for all or substantially all of its property, or (iii) orders the liquidation of the Company or any Subsidiary; or

(i) if at any time the Company is not eligible to transfer its Common Stock electronically as DWAC Shares.

In addition to any other rights and remedies under applicable law and this Agreement, so long as an Event of Default has occurred and is continuing, or if any event which, after notice and/or lapse of time, would become an Event of Default has occurred and is continuing, the Company shall not deliver to the Investor any Regular Purchase Notice, Accelerated Purchase Notice or Additional Accelerated Purchase Notice.

11. TERMINATION

This Agreement may be terminated only as follows:

(a) If pursuant to or within the meaning of any Bankruptcy Law, the Company commences a voluntary case or any Person commences a proceeding against the Company, a Custodian is appointed for the Company or for all or substantially all of its property, or the Company makes a general assignment for the benefit of its creditors (any of which would be an Event of Default as described in Sections 10(f), 10(g) and 10(h) hereof), this Agreement shall automatically terminate without any liability or payment to the Company (except as set forth below) without further action or notice by any Person.

(b) In the event that the Commencement shall not have occurred on or before March 10, 2020, due to the failure to satisfy the conditions set forth in Sections 7 and 8 above with respect to the Commencement, either the Company or the Investor shall have the option to terminate this Agreement at the close of business on such date or thereafter without liability of any party to any other party (except as set forth below); provided, however, that the right to terminate this Agreement under this Section 11(b) shall not be available to any party if such party is then in breach of any covenant or agreement contained in this Agreement or any representation or warranty of such party contained in this Agreement fails to be true and correct such that the conditions set forth in Section 7(c) or Section 8(d), as applicable, could not then be satisfied.

(c) At any time after the Commencement Date, the Company shall have the option to terminate this Agreement for any reason or for no reason by delivering notice (a "Company Termination Notice") to the Investor electing to terminate this Agreement without any liability whatsoever of any party to any other party under this Agreement (except as set forth below). The Company Termination Notice shall not be effective until one (1) Business Day after it has been received by the Investor.

(d) This Agreement shall automatically terminate on the date that the Company sells and the Investor purchases the full Available Amount as provided herein, without any action or notice on the part of any party and without any liability whatsoever of any party to any other party under this Agreement (except as set forth below).

(e) If for any reason or for no reason the full Available Amount has not been purchased in accordance with Section 2 of this Agreement by the Maturity Date, this Agreement shall automatically terminate on the Maturity Date, without any action or notice on the part of any party and without any liability whatsoever of any party to any other party under this Agreement (except as set forth below).

Except as set forth in Sections 11(a) (in respect of an Event of Default under Sections 10(f), 10(g) and 10(h)), 11(d) and 11(e), any termination of this Agreement pursuant to this Section 11 shall be effected by written notice from the Company to the Investor, or the Investor to the Company, as the case may be, setting forth the basis for the termination hereof. The representations and warranties and covenants of the Company and the Investor contained in Sections 3, 4, 5, and 6 hereof, the indemnification provisions set forth in Section 9 hereof and the agreements and covenants set forth in Sections 10, 11 and 12, shall survive the execution and delivery of this Agreement and any termination of this Agreement. No termination of this Agreement shall (i) affect the Company's or the Investor's rights or obligations under this Agreement with respect to pending Regular Purchases and Accelerated Purchases under this Agreement and the Company and the Investor shall complete their respective obligations with respect to any pending Regular Purchases and Accelerated Purchases under this Agreement or (ii) be deemed to release the Company or the Investor from any liability for intentional misrepresentation or willful breach of any of the Transaction Documents.

12. MISCELLANEOUS.

(a) Governing Law; Jurisdiction; Jury Trial. The corporate laws of the State of Delaware shall govern all issues concerning the relative rights of the Company and its stockholders. All other questions concerning the construction, validity, enforcement and interpretation of this Agreement and the other Transaction Documents shall be governed by the internal laws of the State of Illinois, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Illinois or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of Illinois. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the State of Illinois, County of Cook, for the adjudication of any dispute hereunder or under the other Transaction Documents or in connection herewith or therewith, or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to such party at the address for such notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. **EACH PARTY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION HEREWITH OR ARISING OUT OF THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

(b) Counterparts. This Agreement may be executed in two or more identical counterparts, all of which 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; provided that a facsimile signature or signature delivered by e-mail in a ".pdf" format data file shall be considered due execution and shall be binding upon the signatory thereto with the same force and effect as if the signature were an original signature.

(c) Headings. The headings of this Agreement are for convenience of reference and shall not form part of, or affect the interpretation of, this Agreement.

(d) Severability. If any provision of this Agreement shall be invalid or unenforceable in any jurisdiction, such invalidity or unenforceability shall not affect the validity or enforceability of the remainder of this Agreement in that jurisdiction or the validity or enforceability of any provision of this Agreement in any other jurisdiction.

(e) Entire Agreement; Amendment. This Agreement supersedes all other prior oral or written agreements between the Investor, the Company, their affiliates and Persons acting on their behalf with respect to the subject matter hereof, and this Agreement, the other Transaction Documents and the instruments referenced herein contain the entire understanding of the parties with respect to the matters covered herein and therein and, except as specifically set forth herein or therein, neither the Company nor the Investor makes any representation, warranty, covenant or undertaking with respect to such matters. The Company acknowledges and agrees that is has not relied on, in any manner whatsoever, any representations or statements, written or oral, other than as expressly set forth in the Transaction Documents. No provision of this Agreement may be amended other than by a written instrument signed by both parties hereto.

(f) Notices. Any notices, consents or other communications required or permitted to be given under the terms of this Agreement must be in writing and will be deemed to have been delivered: (i) upon receipt when delivered personally; (ii) upon receipt when sent by facsimile or email (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party); or (iii) one Business Day after deposit with a nationally recognized overnight delivery service, in each case properly addressed to the party to receive the same. The addresses for such communications shall be:

If to the Company:
Netlist, Inc.
175 Technology Drive, Suite 150
Irvine, California 92618
Telephone: (949) 435-0025
E-mail: gsasaki@netlist.com
Attention: Gail Sasaki
Chief Financial Officer

With a copy to (which shall not constitute notice or service of process):
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
3580 Carmel Mountain Road, Suite 300
San Diego, CA 92130
Telephone: (858) 314-1880
Facsimile: (858) 314-1501
E-mail: smstanton@mintz.com
Attention: Scott M. Stanton, Esq.

If to the Investor:
Lincoln Park Capital Fund, LLC
440 North Wells, Suite 410
Chicago, IL 60654
Telephone: (312) 822-9300
Facsimile: (312) 822-9301
E-mail: jscheinfeld@lpcfunds.com/jcope@lpcfunds.com
Attention: Josh Scheinfeld/Jonathan Cope

If to the Transfer Agent:

Computershare Trust Company, N.A.
8742 Lucent Blvd., Suite 225
Highlands Ranch, CO 80129
Telephone: (303) 262-0790
E-mail: Lee.Meier@computershare.com
Attention: Lee Meier

or at such other address and/or facsimile number or email address and/or to the attention of such other Person as the recipient party has specified by written notice given to each other party three (3) Business Days prior to the effectiveness of such change. Written confirmation of receipt (A) given by the recipient of such notice, consent or other communication, (B) mechanically or electronically generated by the sender's facsimile machine or email account containing the time, date, and recipient facsimile number or email address, as applicable, and an image of the first page of such transmission or (C) provided by a nationally recognized overnight delivery service, shall be rebuttable evidence of personal service, receipt by facsimile or receipt from a nationally recognized overnight delivery service in accordance with clause (i), (ii) or (iii) above, respectively.

(g) Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties and their respective successors and assigns. The Company shall not assign this Agreement or any rights or obligations hereunder without the prior written consent of the Investor, including by merger or consolidation. The Investor may not assign its rights or obligations under this Agreement.

(h) No Third Party Beneficiaries. This Agreement is intended for the benefit of the parties hereto and their respective permitted successors and assigns and, except as set forth in Section 9, is not for the benefit of, nor may any provision hereof be enforced by, any other Person.

(i) Publicity. The Company shall afford the Investor and its counsel with the opportunity to review and comment upon, shall consult with the Investor and its counsel on the form and substance of, and shall give due consideration to all such comments from the Investor or its counsel on, any press release, SEC filing or any other public disclosure by or on behalf of the Company relating to the Investor, its purchases hereunder or any aspect of the Transaction Documents or the transactions contemplated thereby, not less than 24 hours prior to the issuance, filing or public disclosure thereof. The Investor must be provided with a final version of any such press release, SEC filing or other public disclosure at least 24 hours prior to any release, filing or use by the Company thereof. The Company agrees and acknowledges that its failure to fully comply with this provision constitutes a Material Adverse Effect.

(j) Further Assurances. Each party shall do and perform, or cause to be done and performed, all such further acts and things, and shall execute and deliver all such other agreements, certificates, instruments and documents, as the other party may reasonably request in order to consummate and make effective, as soon as reasonably possible, the Commencement, and to carry out the intent and accomplish the purposes of this Agreement and the consummation of the transactions contemplated hereby.

(k) No Financial Advisor, Placement Agent, Broker or Finder. The Company represents and warrants to the Investor that it has not engaged any financial advisor, placement agent, broker or finder in connection with the transactions contemplated hereby. The Investor represents and warrants to the Company that it has not engaged any financial advisor, placement agent, broker or finder in connection with the transactions contemplated hereby. The Company shall be responsible for the payment of any fees or commissions, if any, of any financial advisor, placement agent, broker or finder relating to or arising out of the transactions contemplated hereby. The Company shall pay, and hold the Investor harmless against,

any liability, loss or expense (including, without limitation, reasonable attorneys' fees and out of pocket expenses) arising in connection with any such claim.

(l) No Strict Construction. 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.

(m) Remedies, Other Obligations, Breaches and Injunctive Relief. The Investor's remedies provided in this Agreement, including, without limitation, the Investor's remedies provided in Section 9, shall be cumulative and in addition to all other remedies available to the Investor under this Agreement, at law or in equity (including a decree of specific performance and/or other injunctive relief), no remedy of the Investor contained herein shall be deemed a waiver of compliance with the provisions giving rise to such remedy and nothing herein shall limit the Investor's right to pursue actual damages for any failure by the Company to comply with the terms of this Agreement. The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Investor and that the remedy at law for any such breach may be inadequate. The Company therefore agrees that, in the event of any such breach or threatened breach, the Investor shall be entitled, in addition to all other available remedies, to an injunction restraining any breach, without the necessity of showing economic loss and without any bond or other security being required.

(n) Enforcement Costs. If: (i) this Agreement is placed by the Investor in the hands of an attorney for enforcement or is enforced by the Investor through any legal proceeding; (ii) an attorney is retained to represent the Investor in any bankruptcy, reorganization, receivership or other proceedings affecting creditors' rights and involving a claim under this Agreement; or (iii) an attorney is retained to represent the Investor in any other proceedings whatsoever in connection with this Agreement, then the Company shall pay to the Investor, as incurred by the Investor, all reasonable costs and expenses including reasonable attorneys' fees incurred in connection therewith, in addition to all other amounts due hereunder. If this Agreement is placed by the Company in the hands of an attorney for enforcement or is enforced by the Company through any legal proceeding, then the Investor shall pay to the Company, as incurred by the Company, all reasonable costs and expenses including reasonable attorneys' fees incurred in connection therewith, in addition to all other amounts due hereunder.

(o) Waivers. No provision of this Agreement may be waived other than in a written instrument signed by the party against whom enforcement of such waiver is sought. No failure or delay in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privilege.

* * * * *

IN WITNESS WHEREOF, the Investor and the Company have caused this Agreement to be duly executed as of the date first written above.

THE COMPANY:

NETLIST, INC.

By: /s/ GAIL SASAKI
Name: Gail Sasaki
Title: CFO

INVESTOR:

LINCOLN PARK CAPITAL FUND, LLC
BY: LINCOLN PARK CAPITAL, LLC
BY: ROCKLEDGE CAPITAL CORPORATION

By: /s/ JOSH SCHEINFELD
Name: Josh Scheinfeld
Title: President

EXHIBITS

Exhibit A	Form of Officer's Certificate
Exhibit B	Form of Resolutions of the Board of Directors of the Company
Exhibit C	Form of Secretary's Certificate
Exhibit D	Information About Investor Furnished to the Company

EXHIBIT A

FORM OF OFFICER'S CERTIFICATE

This Officer's Certificate ("**Certificate**") is being delivered pursuant to Section 8(d) of that certain Purchase Agreement dated as of March __, 2020, ("**Purchase Agreement**"), by and between **NETLIST, INC.**, a Delaware corporation (the "**Company**"), and **LINCOLN PARK CAPITAL FUND, LLC** (the "**Investor**"). Terms used herein and not otherwise defined shall have the meanings ascribed to them in the Purchase Agreement.

The undersigned, _____, _____ of the Company, hereby certifies, on behalf of the Company and not in his individual capacity, as follows:

1. I am the _____ of the Company and make the statements contained in this Certificate;

2. The representations and warranties of the Company are true and correct in all material respects (except to the extent that any of such representations and warranties is already qualified as to materiality in Section 4 of the Purchase Agreement, in which case, such representations and warranties are true and correct without further qualification) as of the date when made and as of the Commencement Date as though made at that time (except for representations and warranties that speak as of a specific date, in which case such representations and warranties are true and correct as of such date);

3. The Company has performed, satisfied and complied in all material respects with covenants, agreements and conditions required by the Transaction Documents to be performed, satisfied or complied with by the Company at or prior to the Commencement Date.

4. The Company has not taken any steps, and does not currently expect to take any steps, to seek protection pursuant to any Bankruptcy Law nor does the Company or any of its Subsidiaries have any knowledge or reason to believe that its creditors intend to initiate involuntary bankruptcy or insolvency proceedings. The Company is financially solvent and is generally able to pay its debts as they become due.

IN WITNESS WHEREOF, I have hereunder signed my name on this ___ day of _____.

_____
Name:
Title:

The undersigned as Secretary of **NETLIST, INC.**, a Delaware corporation, hereby certifies that _____ is the duly elected, appointed, qualified and acting _____ of _____ and that the signature appearing above is his genuine signature.

_____
Secretary

EXHIBIT B

FORM OF COMPANY RESOLUTIONS
FOR SIGNING PURCHASE AGREEMENT

UNANIMOUS WRITTEN CONSENT OF
NETLIST, INC.

In accordance with the corporate laws of the state of Delaware, the undersigned, being all of the directors of **NETLIST, INC.**, a Delaware corporation (the "Corporation"), do hereby consent to and adopt the following resolutions as the action of the Board of Directors for and on behalf of the Corporation and hereby direct that this Consent be filed with the minutes of the proceedings of the Board of Directors:

WHEREAS, there has been presented to the Board of Directors of the Corporation a draft of the Purchase Agreement (the "Purchase Agreement") by and between the Corporation and Lincoln Park Capital Fund, LLC ("Lincoln Park"), providing for the purchase by Lincoln Park of up to Twenty Million Dollars ($20,000,000) of the Corporation's common stock, $0.001 par value per share (the "Common Stock"); and

WHEREAS, after careful consideration of the Purchase Agreement, the documents incident thereto and other factors deemed relevant by the Board of Directors, the Board of Directors has determined that it is advisable and in the best interests of the Corporation to engage in the transactions contemplated by the Purchase Agreement, including, but not limited to, the issuance of up to 2,446,483 shares of Common Stock to Lincoln Park as a commitment fee (the "Commitment Shares") and the sale of shares of Common Stock to Lincoln Park up to the available amount under the Purchase Agreement (the "Purchase Shares").

Transaction Documents

NOW, THEREFORE, BE IT RESOLVED, that the transactions described in the Purchase Agreement are hereby approved and _____ (the "Authorized Officers") are severally authorized to execute and deliver the Purchase Agreement, and any other agreements or documents contemplated thereby, with such amendments, changes, additions and deletions as the Authorized Officers may deem to be appropriate and approve on behalf of, the Corporation, such approval to be conclusively evidenced by the signature of an Authorized Officer thereon; and

FURTHER RESOLVED, that the terms and provisions of the forms of Irrevocable Transfer Agent Instructions and Notice of Effectiveness of Registration Statement (collectively, the "Instructions") are hereby approved and the Authorized Officers are authorized to execute and deliver the Instructions on behalf of the Company in accordance with the Purchase Agreement, with such amendments, changes, additions and deletions as the Authorized Officers may deem appropriate and approve on behalf of, the Corporation, such approval to be conclusively evidenced by the signature of an Authorized Officer thereon; and

Execution of Purchase Agreement

FURTHER RESOLVED, that the Corporation be and it hereby is authorized to execute the Purchase Agreement providing for the purchase of up to Twenty Million Dollars ($20,000,000) of the Corporation's common stock; and

Issuance of Common Stock

FURTHER RESOLVED, that the Corporation is hereby authorized to issue to Lincoln Park Capital

Fund, LLC, 1,529,052 shares of Common Stock as Initial Commitment Shares and that upon issuance of the Initial Commitment Shares pursuant to the Purchase Agreement the Initial Commitment Shares shall be duly authorized, validly issued, fully paid and nonassessable with no personal liability attaching to the ownership thereof; and

FURTHER RESOLVED, that the Corporation is hereby authorized to issue up to 917,431 shares of Common Stock as Additional Commitment Shares under the Purchase Agreement in accordance with the terms of the Purchase Agreement and that, upon issuance of the Additional Commitment Shares pursuant to the Purchase Agreement, the Additional Commitment Shares will be duly authorized, validly issued, fully paid and nonassessable with no personal liability attaching to the ownership thereof; and

FURTHER RESOLVED, that the Corporation shall reserve 917,431 shares of Common Stock for issuance as Additional Commitment Shares under the Purchase Agreement; and

FURTHER RESOLVED, that the Corporation is hereby authorized to issue shares of Common Stock upon the purchase of Purchase Shares up to the Available Amount under the Purchase Agreement in accordance with the terms of the Purchase Agreement and that, upon issuance of the Purchase Shares pursuant to the Purchase Agreement, the Purchase Shares will be duly authorized, validly issued, fully paid and nonassessable with no personal liability attaching to the ownership thereof; and

FURTHER RESOLVED, that the Corporation shall initially reserve 37,553,517 shares of Common Stock for issuance as Purchase Shares under the Purchase Agreement; and

Approval of Actions

FURTHER RESOLVED, that, without limiting the foregoing, the Authorized Officers are, and each of them hereby is, authorized and directed to proceed on behalf of the Corporation and to take all such steps as deemed necessary or appropriate, with the advice and assistance of counsel, to cause the Corporation to consummate the agreements referred to herein and to perform its obligations under such agreements; and

FURTHER RESOLVED, that the Authorized Officers be, and each of them hereby is, authorized, empowered and directed on behalf of and in the name of the Corporation, to take or cause to be taken all such further actions and to execute and deliver or cause to be executed and delivered all such further agreements, amendments, documents, certificates, reports, schedules, applications, notices, letters and undertakings and to incur and pay all such fees and expenses as in their judgment shall be necessary, proper or desirable to carry into effect the purpose and intent of any and all of the foregoing resolutions, and that all actions heretofore taken by any officer or director of the Corporation in connection with the transactions contemplated by the agreements described herein are hereby approved, ratified and confirmed in all respects.

IN WITNESS WHEREOF, the Board of Directors has executed and delivered this Consent effective as of _____, 2020.

_____

_____

_____

being all of the directors of **NETLIST, INC.**

EXHIBIT C

FORM OF SECRETARY'S CERTIFICATE

This Secretary's Certificate ("Certificate") is being delivered pursuant to Section 8(e) of that certain Purchase Agreement dated as of March ___, 2020 ("Purchase Agreement"), by and between **NETLIST, INC.**, a Delaware corporation (the "Company"), and **LINCOLN PARK CAPITAL FUND, LLC** (the "Investor"), pursuant to which the Company may sell to the Investor up to Twenty Million Dollars ($20,000,000) of the Company's Common Stock, $0.001 par value per share (the "Common Stock"). Terms used herein and not otherwise defined shall have the meanings ascribed to them in the Purchase Agreement.

The undersigned, _____, Secretary of the Company, hereby certifies, on behalf of the Company and not in his individual capacity, as follows:

1. I am the Secretary of the Company and make the statements contained in this Secretary's Certificate.

2. Attached hereto as Exhibit A and Exhibit B are true, correct and complete copies of the Company's bylaws ("Bylaws") and Certificate of Incorporation ("Charter"), in each case, as amended through the date hereof, and no action has been taken by the Company, its directors, officers or stockholders, in contemplation of the filing of any further amendment relating to or affecting the Bylaws or Charter.

3. Attached hereto as Exhibit C are true, correct and complete copies of the resolutions duly adopted by the Board of Directors of the Company on _____, at which a quorum was present and acting throughout. Such resolutions have not been amended, modified or rescinded and remain in full force and effect and such resolutions are the only resolutions adopted by the Company's Board of Directors, or any committee thereof, or the stockholders of the Company relating to or affecting (i) the entering into and performance of the Purchase Agreement, or the issuance, offering and sale of the Purchase Shares and the Commitment Shares and (ii) and the performance of the Company of its obligation under the Transaction Documents as contemplated therein.

4. As of the date hereof, the authorized, issued and reserved capital stock of the Company is as set forth on Exhibit D hereto.

IN WITNESS WHEREOF, I have hereunder signed my name on this ___ day of _____.

_____
Secretary

The undersigned as _____ of **NETLIST, INC.**, a Delaware corporation, hereby certifies that _____ is the duly elected, appointed, qualified and acting Secretary of **NETLIST, INC.**, and that the signature appearing above is [his/her] genuine signature.

_____

EXHIBIT D

Information About The Investor Furnished To The Company By The Investor Expressly For Use In Connection With The Initial Prospectus Supplement

Information With Respect to Lincoln Park Capital

As of the date of the Purchase Agreement, Lincoln Park Capital Fund, LLC, beneficially owned _____ shares of our common stock. Josh Scheinfeld and Jonathan Cope, the Managing Members of Lincoln Park Capital, LLC, the manager of Lincoln Park Capital Fund, LLC, are deemed to be beneficial owners of all of the shares of common stock owned by Lincoln Park Capital Fund, LLC. Messrs. Cope and Scheinfeld have shared voting and investment power over the shares being offered under the prospectus supplement filed with the SEC in connection with the transactions contemplated under the Purchase Agreement. Lincoln Park Capital, LLC is not a licensed broker dealer or an affiliate of a licensed broker dealer.

EXHIBIT 21.1

SUBSIDIARIES OF NETLIST, INC.

Each of the following is a wholly owned direct subsidiary of Netlist, Inc.:

Entity Name	Jurisdiction of Organization
Netlist Electronics (Suzhou) Co., Ltd	People's Republic of China
Netlist HK Limited	Hong Kong
Netlist Luxembourg S.a r.l.	Luxembourg

EXHIBIT 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in Registration Statement Nos. 333-139435, 333-146141, 333-151644, 333-161832, 333-161834, 333-164261, 333-165916, 333-168330, 333-173646, 333-179776, 333-193862, 333-211658, 333-221655, 333-224287, 333-228349 and 333-230443 on Form S-8 and in Registration Statement Nos. 333-164290, 333-177118, 333-199446, 333-227291 and 333-228348 on Form S-3 of our report dated March 10, 2020, relating to the consolidated financial statements of Netlist, Inc. and subsidiaries, appearing in this Annual Report on Form 10-K of Netlist, Inc. for the year ended December 28, 2019.

/s/ KMJ Corbin & Company LLP

Costa Mesa, California
March 10, 2020

EXHIBIT 31.1

CERTIFICATION

I, Chun K. Hong, certify that:

1. I have reviewed this Annual Report on Form 10-K for the fiscal year ended December 28, 2019 of Netlist, Inc., a Delaware corporation (the "Registrant");

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 quarter (the Registrant's fourth 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.

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, 2020

/s/ Chun K. Hong
Chun K. Hong
President, Chief Executive Officer and Chairman of the Board
(Principal Executive Officer)

EXHIBIT 31.2

CERTIFICATION

I, Gail Sasaki, certify that:

1. I have reviewed this Annual Report on Form 10-K for the fiscal year ended December 28, 2019 of Netlist, Inc., a Delaware corporation (the "Registrant");

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 quarter (the Registrant's fourth 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.

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, 2020

/s/ Gail Sasaki
Gail Sasaki
Vice President and Chief Financial Officer
(Principal Financial Officer)

EXHIBIT 32

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 on Form 10-K of Netlist, Inc., a Delaware corporation ("Netlist") for the fiscal year ended December 28, 2019, as filed with the Securities and Exchange Commission on March 10, 2020 (the "Report"), Chun K. Hong, president, chief executive officer and chairman of the board of Netlist, and Gail Sasaki, vice president and chief financial officer of Netlist, each hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to his or her knowledge:

(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 Netlist.

Date: March 10, 2020

/s/ Chun K. Hong
Chun K. Hong
President, Chief Executive Officer and Chairman of the Board
(Principal Executive Officer)

Date: March 10, 2020

/s/ Gail Sasaki
Gail Sasaki
Vice President and Chief Financial Officer
(Principal Financial Officer)